

Modernization of Smart Education Driving Towards IR 4.0: Smart Learning & Reminders App

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Abstract

This research focusing on educational modernization drives the development of culture and innovation. Studies have shown that education helps to improve the potential of individuals while preserving the local culture. The Industrial Revolution 4.0 was a new era in the use of advanced technology. Humans are cultural beings, essentially the creators of culture itself. Culture develops alongside the potential of human beings to develop as cultural creators. Researchers have already identified in previous studies that there are no longer mobile applications that follow certain good practice models or guidelines or standard procedures, especially at KUPTM. The application of the M-learning approach takes into account the weaknesses of conventional learning systems. The objectives of this research is to provide and introduce a good practice smart learning model and to develop a prototype of mobile application (Smart Learning & Reminders App) as an innovation project to enhance the development of local culture today as well as technical changes of teaching and learning process especially to address the situation the COVID-19 pandemic that is sweeping the world today. The entire research will use qualitative methodology to building the Smart Learning & Reminders mobile application, based on good practice smart learning model and ADDIE model framework. The modernization of education has a profound effect on the development of local culture today and seeks information with technical assistance to bring out new changes in teaching and learning techniques.

Keywords: Smart Learning, Educational Modernization, Cultural Development, Innovation, Smart Education.

Introduction

The modernization of education to the era of revolution industry 4.0 requires a new surge and paradigm for the diversity of cultures and the complexity of the challenges to be faced. In fact, globalization has opened up all spaces and opportunities for students to accept any form of influence whether positive or negative. In this century, information boom has made Malaysia dramatic progress in various aspects of life. A positive approach and conducive

environment with students must be created so that they can receive information, views and ideas through more effective teaching and learning processes.

Apart from that (Kassim & Ahmad, 2010), it was identified as a challenge for educators to link the gap between awareness and knowledge between instructors and students in teaching and learning. It cannot be denied that infinite global factors and the rapid rise of globalization have a profound effect on the development of Malaysian citizens and the effectiveness of the education system. Long exposure to mass media and social influences adversely affects students' moral value. The presence of various TV channels, radios, and millions of web pages is a matter of youth education, especially Muslim youth. It is important to focus not only on the infrastructure and classroom layout but also on the effectiveness of this modernized education. The final determinant of success is student-centred teaching and learning activities. The role of the instructor is becoming increasingly difficult as it should be an effective facilitator for students in and outside the classroom. Industrial Revolution 4.0 era, you need to prepare all levels of education for education and learning. That is because they are the enforcement mechanism for all developed policies and curriculums.

The era of the Industrial Revolution 4.0 accesses and browses ever-growing new media. According to statistics announced in 2015 (Malaysia Social Media Statistic 2014, 2016), there are 10.4 million active Facebook users, 3.5 million twitter users, and 5.6 million people who will be Instagram users (Tapsir, 2017). Data also show that 21.9 million (73%) of Malaysians use the WhatsApp ratio, which has the third highest population in the world. In fact, according to the data, 19.2 million (64%) of the population are Internet users, and they use 2.8 hours a day to access social websites. Apart from the survey results, it also shows that 16.5 million (55%) Malaysians are active users of social media (Selamat, 2017). Even consumption levels are expected to increase, in particular Facebook is expected in 2019, and Malaysia is expected to have 13.2 Facebook users (Suhaimi & Hussin, 2018).

However, (Chear, 2017) explains the important relationship between the development of adolescent social psychology and the exposure of mass media and social media. In the Malaysian context, social media use among Malaysians is at the highest level in the world and is expected to continue to grow. The ease of the Internet network and the sale of various inexpensive and easy-to-use wireless mobile devices are increasing the use of social media among the domestic community.

(Ab. Halim & Hussin, 2017) Encourages us to work together to look at the Japanese people who represent them in the global community. Look at them to stick to their cultural roots wherever they are. They are examples of countries successfully modernized based on regional possibilities. With regard to incoming foreign influences, they absorb and overcome their culture rather than swallowing them. Local culture is an integral part of sustainability and can be used to contribute to the positive development of a formal and informal education world. The science of wisdom is also dynamic and can be used in different approaches and different educational stages.

Problem Statement

There are several problems identified from previous studies that the service delivery mechanism for the education sector is still low and lagging behind other sectors with referred

statistic RMK11 2016-2020 (Arfah (MAMPU), 2015). In addition, Malaysia is still lagging behind and is at the lowest level for educational and technological readiness in Evolution of Malaysia's Competitiveness 2016-2017 Report (Liu, Huang, & Wosinski, 2017). In fact, there are no more mobile applications that follow certain good practice models or guidelines or standard procedures, especially in KUPTM (Murad, 2021). This Mobile Application aims to transform conventional teaching and learning techniques to mobile technology towards IR 4.0 and to address learning problems throughout the Covid-19 pandemic. It is very important to fix or identify other problems in the future.

Research objectives

The objective of this research paper is to provide and introduce a good practice smart learning model based on mobile service delivery in the teaching and learning process (Murad, 2021). Apart from that, this study also proposes a prototype of mobile application (Smart Learning & Reminders App) based on good practice smart learning model as an innovation project to enhance the development of local culture today as well as assistance and technical changes of teaching and learning process -19 that hit the world today.

Literature Review

Education in Malaysia is now heading to the Industrial Revolution 4.0 era using virtual technology and advanced equipment. The modernization of today's education has a major impact on the development of regional cultures that demand the availability of information with technical assistance to bring new changes to teaching and learning techniques. Education works to increase the potential of individuals while maintaining the local culture. Human being as a cultural creature, essentially the creator of culture itself. Culture is evolving in parallel with the enhancement of human potential as a creator of culture.

Products such as iPhone, Android, Blackberry, Twitter, Facebook, YouTube, and Google are due to the emergence of innovative ideas in Western Europe. According to (Ahmad, Hassan, Akma, & Ariffin, 2014), this invention has changed the way people live today, making human life more challenging, fun and competitive. In fact, Modernization of education has made some countries more prominent like Korea, Finland and other developed countries. Faced with the situation, Malaysia also needs to look forward to turning education in new directions, especially among the new generation, to promote the development of the culture of our country.

According to Schwab (2016), the industrial revolution 4.0 can be illustrated by the emergence of intelligent robots, driverless vehicles, supercomputers and the development of neuroethologies to facilitate human life using robots that are the best friends in the management of activities and daily tasks. Believe it or not, one day the food order that we place by phone will be delivered by drone to the front door. In addition, all household chores, such as cleaning the dishes, carving the ground, feeding the animal and turning off the lights, must press the buttons on their smartphone without having to clean the house. To get to work, we do not have to worry about driving on congested roads. Everything will be done by simply pressing a key, passengers will be able to continue sleeping in their car and all driving devices will be fully satellite controlled to their destination (Cheng et al., 2017). This situation may seem strange, but it will gradually become a common form of the future and all human affairs will be shared with specially designed robots to optimize needs and comfort. Although these technologies are still in the global testing phase, many applications used have been

appreciated. For example, the use of navigation applications such as Waze or Google Maps, which provides drivers with travel and travel information, is one of the first examples of a global introduction called Internet of Things (IoT)(Petcovici & Stroulia, 2017).

However (Ab. Halim & Hussin, 2017) argue that modern education is not just about creating good citizens, but more about the citizens of the world with skills, knowledge and motivation to tackle humanitarian and environmental issues. It says. Especially in the context of Malaysian, the development of cultural development brings a positive attitude, and in order to eliminate racial prejudice and the flow of people in order to respect ethnic, racial and cultural differences. It is about creating solidarity between various races and ethnic groups in Malaysia. Cultural value should be understood as a series of values closely related to the social system of society.

Meanwhile (Chear, 2017), the modernization of today's education is global, often related to the achievement of learning outcomes and the marketability of graduates. Advances in communication and information technology (ICT) have more closely connected world communities and organizations with one another in a more borderless world community. Modern learning also emphasizes the rapid development and progress after mobile technology has been applied to Malaysian educational systems, but motivates students and by using mobile learning technology or m-learning gave an opportunity to study thoroughly (Hamdan, Din, & Manaf, 2013). The use of modern equipment, such as mobile learning technology and modern life needs, has enabled the human mind and attitude to create new values in line with the strength of technology influence and socio-cultural life. In this regard, education is a tool of community social strength to develop a system for instilling members of society related to changing demands of time.

Research Methodology

Research methodology is an approach which contain plan for conducting research. Sociologists draw on a variety of both qualitative and quantitative research methods, including distribute questionnaires, survey research, participant interviews, and secondary data. Quantitative methods aim to classify features, count them, and create statistical models to test hypotheses and objective. Qualitative methods aim for a complete, detailed description including the context of events and circumstances. This research study are using qualitative method as research methodology to develop prototype mobile application namely Smart Learning & Reminders App based on good practice smart learning model and ADDIE model as a framework.

Good Practice Smart Learning Model

Figure 1 shows a good practice smart learning model as a temporary guideline before an m-learning policy or policy is established. The results of previous studies show that there are still no guidelines, m-learning policies issued by the MOHE or any responsible party so far. The key elements are organizational structure, infrastructure, teaching and learning, research and development, and culture.

There are three (3) stakeholders involve that is administrators, lecturers and students. The good practice of implementing m-learning is to drive the Institute of Higher Learning (KUPTM/KPTM) towards digital education and realize the IR 4.0 revolution.

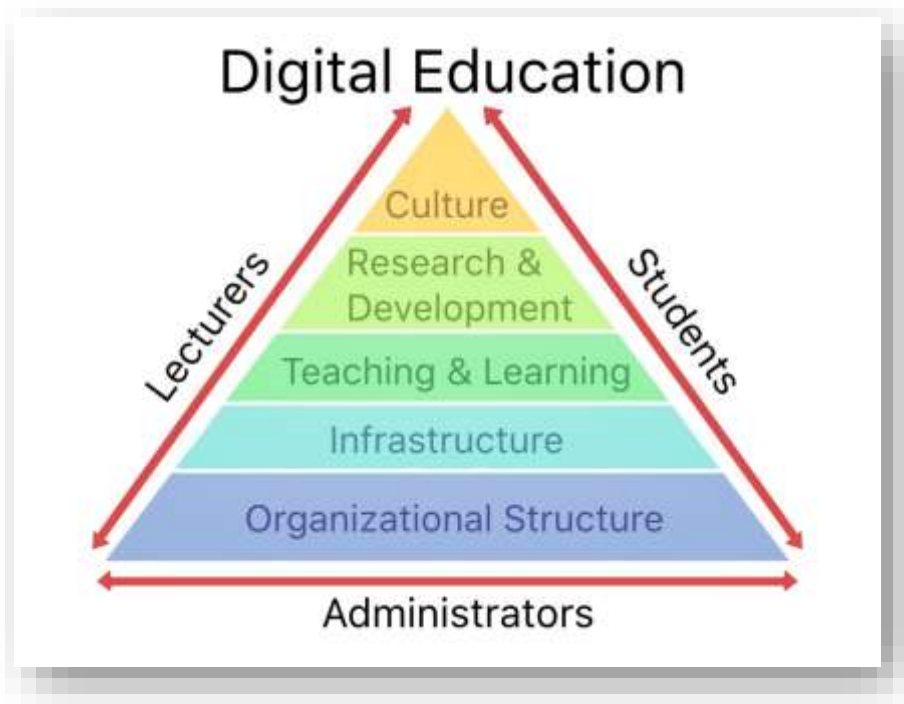


Figure 1: Good practice smart learning model

ADDIE Model Framework

For many years now, educators and instructional designers alike have used the ADDIE Instructional Design (ID) method as a framework in designing and developing educational and training programs. Figure 2 shows the ADDIE model which “ADDIE” stands for Analyse, Design, Develop, Implement, and Evaluate. The innovation project also used ADDIE model as framework in designing and developing Smart Learning & Reminders App.



Figure 2: ADDIE Model

The generic term for the five-phase instructional design model consisting of Analysis, Design, Development, Implementation, and Evaluation. Each step has an outcome that feeds into the next step in the sequence. Table 1 shows the five phases of ADDIE which are as follows:

Table 1:

Phases of ADDIE model

Analysis	During analysis, the designer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery options, and the timeline for the project.
Design	A systematic process of specifying learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content is determined here.
Development	The actual creation (production) of the content and learning materials based on the Design phase.
Implementation	During implementation, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated.
Evaluation	This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunities for feedback from the users. Revisions are made as necessary.

Proposed Conceptual Framework

Through the problems of this study, the conceptual framework proposal has been designed to help solve it. Figure 3 shows the conceptual framework for this study which consists of variables and case study.

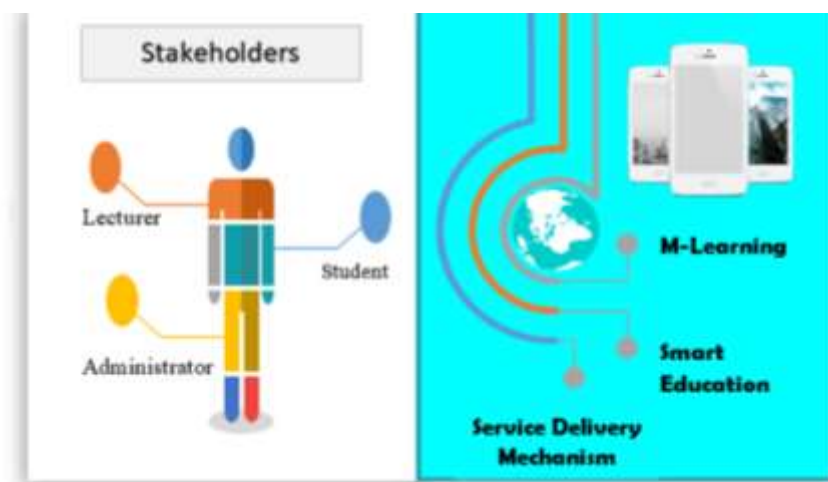


Figure 3: Conceptual Framework

There are some key elements in the study such as current practices, benefits and challenges as indirect variables while direct variables are m-Learning. Current practice variables are

mediators between benefit variables and challenges. A case study will be conducted at the Kolej Universiti Poly-Tech MARA (KUPTM) and Kolej Poly-Tech MARA (KPTM) which involves lecturers, students and administrators as stakeholders who relate to each other in the context of service delivery mechanisms, smart education and M-Learning.

Conceptual Framework Elements

Lecturer

Helps to transform traditional learning into local communities into blended learning that enables lecturers and supervisors to provide effective education, and help them access the mobile teaching world and evaluate their student performance continuously. In addition, lecturers can also disseminate important information to students by using their mobile devices anytime and anywhere quickly and easily.

Student

Encourage students to activate their mobile devices; download mobile apps to support the m-Learning process, and utilize them anytime and anywhere and have wireless networks available (Wi-Fi, 3G, 4G). In addition, it can help students to get the information they need especially in learning as in developed countries.

Administrator

Spell the name of the institution by helping, managing and implementing m-Learning.

Service Delivery System

The service delivery system is a set of principles, standards, policies and constraints that will be used to guide the design, development, use, operation and retirement of services provided by the service provider in order to offer a consistent service of a particular user community within the context of a particular business. The mechanism of delivery mechanisms is the context in which the capabilities of service providers are organized into service (Oosterom, 2007).

Smart Education

The next generation of learning concepts, smart learning environment, and smart classroom concepts appear. Learning space is a new field of research aimed at promoting free, flexible learning and dealing with providing learning skills and appropriate learning methods (Zhuang et al., 2017).

Potential Applications

This innovative project is to build a mobile application that allows students and instructors to communicate and perform the teaching and learning process on a mobile basis. This app offers many new and more attractive designs so that it is more user friendly, and so that students have no problem in pursuing their studies at higher educational institutions. The notes in the app look more attractive, colourful and ease to read. Positively, this mobile app can improve student productivity and help students think innovatively and help in time management. All the features bundled with this mobile app work well, and this mobile app helps restore data so users do not have to worry about losing data. There are novelties in educational practice that include in this mobile application which are:

- Comprehensively provides download and upload functions of teaching and learning notes, provides reminders related to student activities and provides class scheduling.
- Key features are a timetable showing a daily or weekly schedule and notes for an overview with text, photo and checklist formats.
- Always keep informed about upcoming classes, reminding quizzes, exams, events and unfinished assignments.
- Other helpful features such as automatically mute the phone during class and keep track of all related tasks.

Conclusion

This research study is very important in order to introduce the concept of mobile technology to users by using smartphones and downloading mobile applications (Mobile app). Users especially students and lecturers can access information anytime and anywhere they are. Therefore, this research study contributes by enriching and helping to strengthen the construction and expansion of the corpus of knowledge through the field of information technology. Thus, to improve the quality of educational modernization, mobile applications are needed.

Contribution

This study contributes by proposed a potential mobile application known as *Smart Learning & Reminders App*. This application has been developed as a prototype to encourage cultural development and innovation. Furthermore, many studies have to be conducted to determine the challenges faced and the use of m-learning in higher education. In addition, the proposed m-learning application for higher education institutions can be expanded to support and adapt to new mobility tools and technologies.

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