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Development of Mobile Application for Cultivating Sustainable Pro-Environmental Behaviour

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Abstract: Environmental problems have consistently become a global concern since decades ago. Most people possess knowledge and awareness of the importance of caring for the environment. However, there are still many who do not practice pro-environmental behaviour. As an effort to cultivate the behaviour among the millennial generation, this paper presents a proposal to develop a mobile application. This paper will discuss the model used to frame the content of the application, as well as the methodological aspects of the application development. The mobile application produced through this research will contribute to support its users to initiate and maintain the practice of pro-environmental behaviours.

Keywords: Mobile application, environmental behaviour, sustainable development, readiness

1. Introduction

Mobile applications have created a massive difference in people's lives. By using mobile applications, learning becomes convenient. It can happen anywhere and anytime as it provides on-the-go information-seeking expediency. Nowadays, various downloadable educational mobile applications of various content can be found in the market. Depending on the design and length of the content, mobile learning such through mobile application was reported in a previous study to be effective to improve learners' achievement and motivation (Haag, 2011). In addition, Han and Lee's (2018) systematic literature review reported that mobile applications have a positive impact on behaviour change. Although their study was conducted specifically on health-related behavioural change, the fact that this finding arises from the results of an analysis of 20 credible articles felt enough to show that it is worth exploring the way to design and develop mobile applications for promoting environmental behaviour change. This is especially due to the urgent situation that calls for an immediate environmental mitigation plan to combat the prolonged environmental issues that has always been a no-win. The significance of this initiative is also supported by Henkel et al, (2019). According to them, green information systems and digital nudging are effective to increase pro-environmental behaviour on the individual, organizational, and societal level. Through a particular function or interface element, digital nudging could guide people to perform a particular action by applying priming effects or status quo bias (Henkel et al., 2019).

Following this, the aim of this study is to design and develop a mobile application for fostering environmental behaviour change, as well as promoting sustainable commitment to perform pro-environmental actions. Specifically, the objectives of the proposed study are: (i) to identify environmental activities that can be participated in by the public of different groups; (ii) to design and develop a mobile application that can help the public to self-regulate their commitment for participating in pro-environmental actions according to their interest and needs; (iii) to design and develop a mobile application that can provide support to initiate and sustain pro-environmental behaviour; and (iv) to investigate the users perspectives on the usability of the mobile application developed.

2. Transtheroetical Model as theoretical framework

To design this mobile application, this project will refer to the Transtheoretical Model (TTM) as a theoretical framework. TTM which was proposed by Prochaska and DiClemente (1982) brings together psychological and sociological factors in behaviour change. "The Transtheoretical Model (TTM) uses stages of change to integrate processes and principles of change across major theories of intervention, hence the name Transtheoretical" (Prochaska et al., 2008, p.97). According to this model, one's progress in behavioural change can be explained based on his/her stage of change. Stage of change refers to the degree of readiness an individual exhibits toward adopting a particular behaviour (Spencer et al., 2007). The concept of stages of change suggests that one can improve to a higher level over time. However, the model also suggests that time is not the sole factor, but requires interaction with processes of change. With regard to these both concepts – i.e. stage of change and process of change, the underlying idea is that intervention for a successful behaviour change should be tailored to a person's specific current stage for change.

3. Methodology

ADDIE Model is commonly used as a step-by-step guide to develop learning media. In the proposed study, I will follow the 5 traditional stages as suggested in the ADDIE model. The details for each of the steps are explained below.

3.1 Phase 1 – Analyse

The need to develop the mobile application has been justified in the research background section. Therefore, the first phase involves identification of the content of the application. As this study adopts TTM, the content of the TTM is mainly to propose environmental activities or experiences that are suitable for individuals' stage of change. To meet this purpose, an online survey will be distributed to environmental related organisations in Malaysia. The survey will contain open ended questions on how the public can get involved with their organisations' environmental projects or activities.

3.2 Phase 2 – Designing

The findings from the previous phase will be used to design the content of the mobile application. In general, the idea is to design the content into two parts. The first part consists of a diagnosis for determining the users' current readiness to change or stage of change. The second part offers suggestions of pro-environmental activities the users may join and ways to get involved in the activities. As suggested in the TTM, the activities will be mapped according to different processes of change for specific stages of changes.

3.3 Phase 3 – Development

This phase will translate the designed content into a tangible prototype of a mobile application. At this stage, the research group will work closely with the technology developer in order to produce the application that is interactive and attractive. More importantly, the mobile application is also aimed to be practical and user-friendly to ensure technical aspects will not affect the efficiency of the mobile application.

3.4 Phase 4 – Implementation

After the prototype has been developed, a group of samples will be selected to pilot the application. The pilot study will be conducted for 6 months. The duration is to allow the respondents to be familiar with the system. In addition, based on the comparison between the concepts for each stage of change in the

TTM, this duration is deemed necessary to observe significant change in one's behaviour.

3.5 Phase 5 – Evaluation

In this phase the usability of the mobile application will be evaluated. The usability evaluation will be made through a questionnaire that will be distributed to 150 users and interviews with 20 participants. The interview aims to get more detailed overviews on how the mobile application could be better in terms of its content, interface and system.

4. Expected Implication of the Study

The mobile application proposed in this paper is for the form of a lifestyle application. It is an application that supports people to go about their daily lives. By using this application, the users will be guided on how to initiate or maintain their practice of pro-environmental behaviour as its content provides customised support for each individual based on his/her current stage of change.

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