Culminating Final Year Project Experiences Among Computing Undergraduate Students in UPSI

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Abstract

Articles placed in the session of Vol 8 No 3 (2021): Special Issue 1/2021: Culminating Experiences dedicated to the Journal of Information and Communication Technology in Education (JICTIE) were composed from ten (10) final year projects from undergraduate students of Computing Department in the Faculty of Arts, Computing and Creative Industries, Universiti Pendidikan Sultan Idris (UPSI), Tanjong Malim, Malaysia. Six articles were produced by students from Bachelor of Education (Information Technology), one article from Bachelor of Education (Multimedia), and three articles from Bachelor of Software Engineering (Educational Software) programs. All articles were written by the students as first authors in collaboration with their supervisors and respective co-authors.

Keyword: final year project, experience, undergraduate students, information and communication technology, education

INTRODUCTION

The ten articles that were specified and met for Vol. 8 No. 3, (2021): Special Issue 1/2021: Culminating Experience represent ten (10) study topics. The first article topic is titled 2A4U: A Visual Reward System Development by Abdul Manaf and Ismail (2021). The second (2) article topic title is Developing A 3D Action-Adventure Game Called "Code - E" for Learning C++ Function Codes by Abidin and Ismail (2021). The third (3) article topic mentioned is The Development of Skin Analyser for Skin Type and Skin Problem Detection by Juwanda and Mat Zin (2021). The forth (4) article topic had been written in the Malay Language for which the title when translated means an Identifying the Level of Readiness for the Use of Webinars for Intervention Subjects in Special Education at UPSI by Ishak and Abas (2021). The fifth (5) article topic entitled Smart Differentiation System using Self-Adaptive Ensemble-based Differential Evolution (SAEDE) as a Learning Aid for Learning Differentiation was written by Mazlan, Shir Li, Budiman, and Mohamad Samuri (2021). The sixth (6) article topic title is Development of Basic Computer Science Interactive Courseware Binary Number System Using Finger Animation written by Putera and Rosli (2021). The seventh (7) article topic entitled The Effectiveness of the Use of Malay Language Learning Videos Among Year 6 Students During Home-Based Learning was by Lai and Rosli (2021). The eighth (8) article topic title is Physical, Mental, and Emotional Fatigue Experienced by IT Students during Covid-19 Pandemic written by Mariappan and Nordin (2021). The ninth (9) article topic is also in the Malay Language which when translated means the Basic Skills of Hand Code Assisted Sign Language Mobile Application Augmentation Reality for Hearing Impaired Students and the General Public written by Mamat and Suhaimi (2021). Last but not least, the final article (10) topic is "E-Ponteng" Mobile Application: To Support Efforts in Handling School Truancy Issues in Problematic Secondary School written by Ismail and Ismail (2021).

ARTICLE DISTRIBUTION

Abdul Manaf and Ismail (2021) have shared their article which aims to discuss a visual reward web-based system that can be used by parents to educate and motivate their children to achieve great performance in terms of good behavior and good academic achievement. The research methodology was based on design and development research (DDR). Besides that, they used the evolutionary prototyping model for the system development. To ensure that the system shall satisfy the targeted users, eight parents were involved in a few cycles of the development. Their requirements were collected through interviews and that information was used to build a prototype for the first cycle. The prototype was designed and developed based on a web-based architecture pattern. Then, in the following cycle, the prototype was used before the users' feedback was collected, and the information was used to improve the prototype. Quantitative data were collected from respondents (parents) using a questionnaire, containing a 5-Likert scale and open-ended questions, right after they had tried the prototype on their children. In general, the findings showed that our users were satisfied with: (i) the clear user

instruction feature (100%), (ii) the user interfaces, system navigation and flexibility (100%), (iii) the system ability (100%), (iv) the response time for displaying pages and saving data (87.5%), and (v) the contents provided were sufficient (75%). The users also shared some of their experiences. In addition, they also found that the reward value exhaustion issue is real. Hopefully, the efforts through this system will encourage parents to be involved actively in nurturing, educating, and motivating their children, and create a healthy environment at home.

In addition, Abidin and Ismail (2021) have experienced studies describing a game prototype development project named "Code-E" for players learning and practicing their knowledge about coding while playing. The research is based on design and development research (DDR) methodology. The main purpose of the project was actually to create a 3D action-adventure game with interesting gameplay for educational purposes that can be used by students (i.e., players) as part of their coding practice. The chosen topic was C++ function codes. Rapid Application Development Model was used as the development method to allow it to focus on minimizing the planning stage and maximizing prototype development. First, the gameplay idea was designed. A quick prototype was developed to assist the potential users to understand the gameplay easily when asked for their feedback on requirements. To collect them from potential users, interviews were conducted. The first gameplay idea was well accepted which required minimal improvement. Then, they designed and developed a full game prototype using Roblox. A questionnaire session was then distributed to obtain further feedback from the potential users. The 5-Likert scale questions were categorized into three categories: the game's technical features, gameplay concepts, and usability as a learning tool. The median values were used to interpret the Likert data. The findings showed that the "Code-E" game prototype functioned well and was accepted by the potential users. Some improvements were still required to enhance its ability in terms of difficulty level and motivation.

Furthermore, Juwanda and Mat Zin (2021) shared the Development of Skin Analyser for Skin Type and Skin Problem Detection. The skin is the body's largest organ and it is essential to take good care of it. Various skincare products are existing in the market that can be used. However, the wrong selection of ingredients can cause irritation and skin sensitivity that would lead to low self-esteem. Moreover, there is a lack of a platform that provides the user with knowledge regarding skin and skincare ingredients. Thus, this study aimed to develop a mobile application that can analyse the face skin type. In this study, automatic face skin detection is proposed. This mobile application gives a recommendation of ingredients based on the user's skin type. The prototyping model was used as a methodology together with Android Studio as the software tool and JavaScript as the programming language. The usability testing involved 30 respondents and the results showed positive feedback towards the features and functionalities of the proposed mobile application. Thus, the development of the Skin Analyser mobile application may help many young women to assist skincare goals and help them feel more confident.

On the other hand, Ishak and Abas (2021) described a study that identified the level of readiness of students in using online learning through webinars for subject Intervention in Special Education at

UPSI. This study was based on three problem statements. Firstly, there were some students lacking skills in using webinar medium for online learning. Secondly, lack of device facilities in accessing online teaching. Thirdly, the challenges of ISMP students to preserve online learning for subject Intervention in Special Education. The research methodology used was the quantitative method, a survey with a questionnaire treated as an instrument for data collection. Data collection for the questionnaire contained three aspects that were the focus of this study named the domains of knowledge, device facilities, and challenges in online learning using webinars. Google form was used as a platform to build the questionnaire and the distribution of the questionnaire was done online using WhatsApp application by sending links to respondents' email. The respondents were UPSI students taking Intervention in Special Education as a subject during the study period. The results showed positive results with an average score (mean) for the knowledge domain aspect was 3.46, for the device convenience aspect was 3.84, and for the challenge aspect was 3.51. The overall mean score was 3.60. The study indicates that the student's readiness for the webinar usage as a medium for online learning showed a positive effect in the subject of Interventions in Special Education.

Referring to a study by Mazlan, Shir Li, Budiman, and Mohamad Samuri (2021) which investigated the effectiveness of an AI-based learning aid for a mathematics topic called differentiation. The justification for the motivation to conduct this study was the premise that learning Mathematics during pandemic Covid-19 became more challenging when students were encouraged to self-learn at home. The authors believed an appropriate combination of pedagogy and technology such as artificial intelligence (AI) would benefit mathematical learning. An artificial intelligence-based learning aid known as the "Smart Differentiation System" or SDS, was developed to allow students to cross-check differentiation solutions in solving differential equations. An AI technique called Self-Adaptive Ensemble Based Differential Evolution (SAEDE) was integrated into the development of the Smart Differentiation System and the development of the system itself was based on the Agile model. A multiple-choice questionnaire was used to collect data from the target group of respondents regarding their problems in learning mathematics and feedback about the Smart Differentiation System. Based on the results, 86.7% of the respondents agreed that the use of Smart Differentiation System as a learning aid in the classroom was more fun and exciting and 80% agreed that Smart Differentiation System was acceptable and can be used by secondary school students in learning mathematics. The study determined that the AI-based learning aid was proof in helping students to perform self-learning in mathematics.

The article written by Putera and Rosli (2021), discussed a study conducted to help students learn the binary number system using finger animation for Basic Computer Science Form 1. The ADDIE model instructional design approach was used as guidance in designing and developing the courseware. The model consists of five phases: analysis phase, design phase, development phase, implementation phase, and evaluation phase. A small-scale study was conducted with selected students and the collected data based on this study were analyzed using a quantitative approach. A questionnaire was used as the main instrument of the study to obtain feedback from teachers on the

use of this courseware. The study implies the use of interactive courseware of binary number systems using finger animation may help teachers to attract students to learn binary numbers easily and correctly.

Following the Covid pandemic which changed the paradigm of education in Malaysia, the goal of the article written by Lai and Rosli (2021) was to identify the effectiveness of the use of Malay language learning videos among Year 6 students during home-based Learning. The objectives of the study were to, firstly identify the level of implementation of Malay language learning using video and to secondly, identify the readiness of the students to undergo video-based learning during home-based learning. Next, this article also reported on the effectiveness of the use of Malay language using video for year 6 students who were learning from home. Quantitative study through a survey method which was used as the methodology for this study. Data collected through a questionnaire using Google Form involving 52 respondents of year 6 students around Kampung Sungai Tapah Tambahan, Ipoh were analyzed using descriptive analysis. The results of this study found that the level of readiness of year 6 students, the level of implementation of learning videos and the level of effectiveness of Malay language learning videos in year 6 during Teaching and Learning at Home (PdPR) were positive with almost 90% of the participants feedback had shown that the video-based learning is one of the best alternatives for cultivating self-learning.

Apart from the school level, higher learning institutions also received indirect effects due to this pandemic situation. In an article written by Mariappan and Nordin (2021) stated that higher learning institutions began to embrace virtual learning which forced the students to adopt new types of learning within a short period. This research paper presented an empirical investigation of physical, mental and emotional fatigue experienced by undergraduate Information Technology (IT) program students during the COVID-19 pandemic. A set of questionnaires validated by three education technology domain experts was developed using the ZEF Scale focusing on physical, mental and emotional fatigue. This study involved a total of 230 undergraduate students of Bachelor of Education (Information Technology). The survey was administered online using Google Form. The collected data had been analyzed using descriptive analysis and inference analysis. The Pearson correlation (r) demonstrated that the study was significant. The findings showed that the majority of undergraduate IT program students were experiencing physical, emotional, and mental fatigue while attending classes virtually.

The article by Mamat and Suhazlan (2021), mentioned that due to the 4.0 Industrial Revolution, the needs and facilities for the community with special needs require attention. Therefore, a mobile application called Let's Learn Sign Language has been developed to help and encourage students with hearing and speech problems, as well as the general public to learn and help facilitate users to remember hand sign language codes correctly. This application has been developed together with the Let's Learn Sign Language module equipped with Augmented Reality (AR) technology so that users can see objects virtually. The mobile app also has an easy-to-learn, simple and interactive interface. The ADDIE model was used to develop this application. The quantitative research approach using a

questionnaire method involved 30 respondents consisting of 4 age categories namely 6-18 years, 19-30 years, 31-40 years and 41 and above. The results showed that more than 80% of users agreed that the application developed together with this learning module benefits the community in learning basic sign language skills.

Referring to an article by Ismail & Ismail (2021), the use of applications and systems in the 21st century is believed to be able to solve various problems involving school management issues. The rationale of this study was to develop an e-Skipping mobile application based on the ADDIE model as a platform that supports the efforts of troubled secondary schools to resolve the issue of skipping school among students. Teachers who work in troubled schools, including counselling teachers, were involved in evaluating the usability of this app. The study involved 30 male and female teachers who had at least one year of work experience in troubled secondary schools. The results of the final study found that more than 90% of the respondents were very satisfied with the simplicity and usability of the application and the interface display and the interesting multimedia elements. Hopefully, the e-Ponteng mobile application will be a suitable application for future use in an effort to address the symptoms of skipping school in troubled secondary schools.

CONCLUSION

Abdul Manaf and Ismail (2021) believe that an effort through this system will encourage parents to be involved actively in nurturing, educating, and motivating their children, and create a healthy environment at home. Abidin and Ismail (2021) findings showed that the "Code-E" game prototype was well-functioned and well-accepted by the potential users. Some improvements were still required to enhance its ability in terms of difficulty level and motivation. On the other hand, Juwanda and Mat Zin (2021) have shown the development of the Skin Analyser mobile application can help many young women in their skin care routine and help them feel more confident. Ishak and Abas (2021) conclude that the results of the study found that the domain of knowledge, device facilities, and challenges in online learning using webinars were the three main influences in the use of webinars for online learning. The results of this study also give implications to the parties involved to be used as a guide in order to ensure ways to help students who have difficulty in improving academic performance when online learning is carried out. One main conclusion from the study of Mazlan, Shir Li, Budiman, and Mohamad Samuri (2021) revealed that the majority of the respondents were satisfied with the ease of accessing and using the SDS as a learning-aid for learning the differentiation topic. Furthermore, they urge several suggestions for the enhancement of the system such as adding more interactive educational content and adding a tracking system for the user to be able to record and track their learning progress easily in the future. Next, Putera and Rosli (2021) conclude that teachers can attract students to learn binary numbers easily and correctly by using interactive courseware that implies finger animation as their teaching and learning aids. Findings from the study by Lai and Rosli (2021) show that learning Malay Language through video is still

relevant and effective for students in terms of implementation and achievement. The selection of appropriate learning videos and the production of videos for learning that follow multimedia elements are proven to have a high impact on students' self-learning. The content in the learning video should be carefully considered so that the information conveyed through the video is concise and the objective of making the video is achieved. Furthermore, Mariappan and Nordin (2021) summarized that open distance learning applied by higher education institutions via video conferencing and virtual learning have become one of the popular choices by educators and students for interaction in this COVID-19 pandemic condition. The amount of time students spend on virtual classes is proportional to their physical, mental, and emotional exhaustion. Education 4.0 which was adapted from the industrial revolution 4.0 also brought many changes to the education landscape especially in special education. Accordingly, a survey by Mamat and Suhaimi (2021) showed that the AR-Apps Let's Learn Sign Language app equipped with the Let's Learn Sign Language Module developed to help hearing impaired students and the community learn basic sign language skills received positive feedback from respondents. Indirectly, AR technology can help increase interest and understanding while changing existing ways of learning. Lastly, the e-Ponteng mobile application developed by Ismail & Ismail (2021) is able to function well as a tool for the transmission of information on students who are skipping school from the subject teacher to the counselor at the school. The simplicity and attractiveness of the interface function facilitates the use of this mobile application.

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