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BizGuru 1.0 : Design and Development of a Mobile-based Digital Marketing Guide for Elderly

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Abstract. BizGuru 1.0 is an online learning platform using mobile devices known as mobile-based learning. It is a modernized alternative to acquiring knowledge which is suitable with the current digitalized environment. BizGuru provides learning materials that promote business-related knowledge, focusing on Digital Marketing. However, in this study, the mobile application design will be focusing on the elder's group to cater for their needs. The target users are people aged 60 years old and above, who use an Android smartphone and are interested in gaining new knowledge. The purpose of the proposed application is to help these retired elderlies find an alternative that enables them to gain income at late age to continue supporting their living expenses. With the current pandemic situation and how they are often related to poverty, both circumstances result in the elders having to struggle to survive financially. Therefore, by using BizGuru, the elderlies do not only get to familiarize themselves with modern devices, but also they could look for other alternatives to gain income and avoid poverty which helps to fulfil the 1st goal of Sustainable Development Goals (SDG) on the eradication of poverty issues. Besides, this proposed application also provides learning opportunities for elderlies who have the desire to gain knowledge at late age which can help fulfil the 4th goal of SDG which is promoting life-long learning opportunities for all.

Keywords: Mobile-based learning, Digital marketing, Elderly community

1 Introduction

The world is now becoming more digitalized with the aid of Information and Communication Technology (ICT) in the forms of mobile phones, computers, laptops, tablets, and TVs until it becomes a necessity in everyday life. ICT has

upgraded human's life such as transforming handwritten letters to electronic mails, in-store shopping to online shopping, and traditional classroom to online learning [1]. This fast-paced technology advancement took place due to the impact of the Covid-19 pandemic which has also increased the e-commerce trends worldwide, including Malaysia. The extensive growth of e-commerce is because of the fact that people are mostly adapting to the new norm which is keeping a safe social distancing and staying indoors to stop the spreading of the virus [2], [3]. The gradual development of ICT in human life since years ago also indicates the significance of technologies in improving the quality of life. With the aid of devices, the productivity and performance of an organization are able to grow positively. However, despite the economic growth in developing countries like Malaysia, people who are much older, or the elderly group, are found to be at risk of poverty in later life [4].

An improper retirement planning is one of the factors that contribute to the rising number of poverty issues among retired elderlies. Due to the increasing life expectancy among the elderly, the retirement planning is very crucial to support their living expenses after retirement [5]. In fact, their only source of income after retirement will be the money that they earn from the past few years of working and the monthly allowance from their family members who are still working. Therefore, to overcome the issues and help the elderlies to reduce their financial burden, a mobile-based learning platform called 'BizGuru' is proposed. Setting up a small business is a great idea to gain income at late age. With the knowledge and guidance on digital marketing provided in BizGuru, the elderlies could promote their businesses on various online platforms. A digital marketing is used to allow the potential customers to learn about the product or service offered. According to Sharma [6], digital marketing is proven to be more effective than traditional marketing due to the growing number of people using digital technologies to shop. Therefore, companies that do not include digital marketing strategies in their businesses such as using blog to market their products are at loss [7].

To fulfill the 4th goal of Sustainable Development Goals (SDG) on promoting lifelong learning opportunities [8], the development of mobile-based learning platform is to encourage the elderlies to gain knowledge despite their old age. This learning platform also helps to create the sense of belonging among the elderlies in the digitalized society. This mobile-based learning platform consists of learning materials on digital marketing in the form of texts, visuals, and audios. With this proposed application, it helps to provide the people interested in digital marketing, the skills and knowledge which they could implement in businesses. Somehow, it will encourage the elderlies to open a small business to help them gain side income, and further to eliminate poverty issues at old age and next, to fulfill the 1st goal of SDG on eradicating poverty. This article is organized in such a way that the following section gives some related work, whereas the outline of our proposed BizGuru is given in Section 3 thereon. The Conceptual Process Flow and Model of BizGuru are described in Section 4, respectively. Section 5 gives

explanations on findings and discussions. Finally, the conclusions are drawn and remarks are made in the last section.

2 Related Work

The development of a mobile-based learning application for elderlies are quite few in numbers. This is due to the needs to be catered for elderlies in terms of UX design are a bit complex as they have poor health conditions. However, these are several past studies that can be found relatable with the proposed application.

2.1 Smartphone for Seniors (S4S) Project

In year 2013, Barros et al. [9] had developed a health-related mobile-based learning application for older adults where they can learn to work out for fall prevention. They conducted the usability test at a local adult care centre for 3 sessions, as an improvement on the app was needed after each session to get the best results. This study shows that visual design is one of the most crucial elements in designing a mobile learning application for older adults. People who have their way of perceiving things, including older adults that are not familiar with the use of a mobile application, have a higher tendency to perceive the functional buttons wrongly. To overcome this problem, the use of icons to represent the text in a button is recommended in this study. It will help to improve the cognitive affordance of an element in a mobile application and avoid errors. Therefore, buttons with short text descriptions and representative icons will be included in the new mobile based learning application to improve the older adults' experience with technology.

2.2 Enhancing Islamic Knowledge via Short Messaging System (SMS)

Alkasirah & Nor [10] had conducted experimental research to explore the potential of mobile-based learning using SMS, based on Adult Learning Theory (Andragogy). The learning topic is about 'waqafa' or known as 'waqf', an Islamic knowledge. The adult learners were tested using the Solomon Four Group Design method and 'waqf' questionnaire whereby the learners were divided into 4 groups (2 groups are control groups, and another 2 groups are the experimental groups). Only the control groups received the SMS regarding 'waqf' knowledge. A pretest and posttest were conducted and the results have shown that the experimental group manages to score higher marks in the posttest which supports the use of mobile learning in education. Besides that, another finding in this research is that adult learners are self-directed as mentioned in the Adult Learning Theory

(Andragogy). Hence, to develop a mobile- based learning application for adult learners, developers need to design content with easy comprehension such as avoiding the use of high vocabulary words. Using high vocabulary words could break the adult learners' self-esteem and lead to the lack of use of the mobile-based learning application

2.3 eVideo Mobile

Patzer et al.[11] had researched a game-based work- related e-learning course which is a digital media in the hospitality industry known as, eVideo. The eVideo used to be web-based learning only. However, with the advancement of technology nowadays that supports mobile-based learning, eVideo is redesigned to be supported by smartphones. The eVideo mobile consists of learning materials including audio and subtitles which are developed by referring to Universal Design for Learning (UDL) and exercises with multiple-choice questions. A pilot study was conducted, and the results have shown that the adult learners were able to adapt to the transformation from web- based to mobile-based learning. Besides, eVideo mobile also made the learning contents accessible anytime and anywhere. However, the downside of the mobile-based is due to the size of the screen compared to web-based. Therefore, to overcome this problem, the new mobile-based learning should be designed using texts with an appropriate size and suitable font for adult learners.

2.4 The SenApp Project

Leen Thomele et al [12] had developed SenApp to evaluate the mobile learning concept on older adults in France and Germany. The SenApp focuses on educating older adults on how to use the Skype application and e-mail. There is a total of 12 short learning materials that explain the communication application. A pilot study was conducted and a total of 40 participants (20 learners from each country) was involved. The older adult learners were required to fill out the questionnaires after finishing the learning materials module. The learning materials were rated good by the learners although they still require some improvement. Older adults' learner with low education background gives a low rating on the SenApp because they have a lack of experience in e-learning and the learning materials are quite hard to be understood. This leads them to spending a shorter time on learning due to low self- confidence and motivation. Therefore, to build a new mobile-based learning application for older adults, the variables such as different target users' educational background should be considered. By reducing the amount of learning material for mobile-based learning, the older adult learners could have a better learning experience with less stress and help them to cope with technology

advancement.

2.5 iPractice: Tablet-Based Home Practice Program in Aphasia Treatment

Kurland et al. [13] had conducted a pilot test on the effectiveness of a tablet-based home practice program in aphasia treatment. The application used is known as 'iPractice' which is specifically designed for iPad users. The participants recruited in this study are 55 to 81 years of age, with language deficiency due to past accidents that had affected the brain responsible for linguistics. Since the participants are at old age, the mobile application is designed with simplicity to provide ease of use in navigating while using the application for people not familiar with the technology. The 'iPractice' application contains 2 types of interactive books: one with objects and one with actions, and each book contains 20 words for the participants to practice. Half of the number of words (10 words) were trained in the treatment program and the others were not trained. Due to the participants' deteriorating eyesight due to old age, the videos and tasks given were able to be viewed in full screen. The participants were able to view the video unlimited times during self-practice. The minimum required time to practice was 20 minutes in 5 or 6 days every week. After every 6 months, the participants were required to follow a check-up at the clinic to check the progress at least once. The results of this study were positive, as they managed to improve their linguistic ability, although there were some complaints received from the users due to their boredom in using the application for practicing for a long period of time. Therefore, in the proposed application designed for the elderlies, each learning material should be designed with simplicity to reduce the time taken for learning and to avoid the feeling of irritation, which will lead to the application being unused.

2.6 Reflection

Therefore, by referring from the previous studies relating to mobile-based learning on the elderlies [7-11], it shows that the elderlies are able to gain knowledge despite their old age. In fact, with the mobility of mobile-based learning, it gives the opportunities for learners to learn at any time and any place. However, there are disadvantages of mobile-based learning on this group such as poor eye-sight and lack of familiarity with the devices. Therefore, to overcome this issue, developers need to implement the UX Design knowledge [14] and align with self-directed learning theory [15] to cater for the needs for learners at old age and provide sufficient information for them to navigate with ease while using the proposed mobile application.

3　Methodology

Instructional System Design (ISD) is a structured development of a digitalized learning platform that applies the instructional theory to establish a set of effective instructions to aid the learning process. In other words, it functions to help people gain knowledge successfully using technology devices [16], [17]. A well-designed tool for an educational purpose helps to improve the learner's ability to learn and to become self-directed [18]. Therefore, developers used ISD models as a reference to plan, create high-quality instructions, and build the system. Besides, a well-known ISD model that is commonly used in designing and developing system is ADDIE model [19]. ADDIE model consists of 5 phases: analysis, design, development, implementation, and evaluation. Each of these phases in figure 1 gives out a necessary result to move to the following stage of the development process [20],[21].
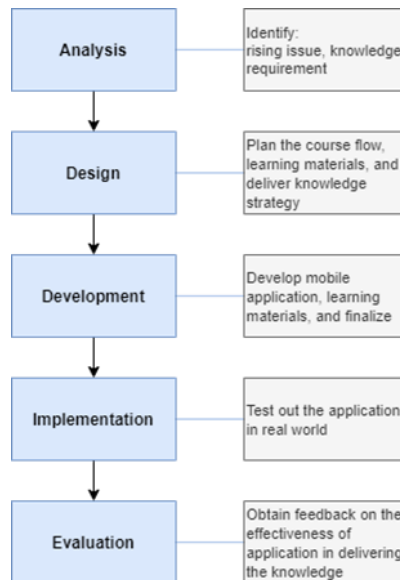

Fig. 1. ADDIE Model Flowchart

3.1　Analysis

Target audience
Target audience is the group of people who are identified to likely be interested in the product offered. BizGuru application design is focused on catering to the needs of old learners. Therefore, the target audience in this study is a group of retired elderlies aged 60 years old and above, regardless of gender and ethnicity.

The criteria are that they must be interested to learn new knowledge and own an Android smartphone. A stable internet connection is required to download and install BizGuru. Apart from that, this target group should have a big interest in learning digital marketing skills or improving their business strategy.

Gap analysis

The elderlies are found to be at risk of poverty at later life [2-3]. Therefore, to help the elderlies find an alternative to gain income at old age, a mobile-based learning application on digital marketing is proposed. This will allow the elderly to adapt with the current technology and help them earn money using an online platform which is easier and which needs less energy and physical movement.

Desired outcome

By exposing the elderlies to digital marketing, they may be encouraged to run a small business to support their living expenses. The elderlies can promote their products or services made from the skills or creativity that they had learned personally throughout their long lives. As a result, the number of aged people with financial problems or at risk of poverty can be reduced and this, in the long run, can provide a better quality of ageing life [8]. Besides that, the elderlies would also get to prevent old-age disease by learning new knowledge during their leisure time, as a form of brain exercise.

3.2   Design

The high-fidelity prototype of BizGuru was made using Adobe XD software which is well-known for its impressive user interface (UI) and user experience (UX) designing and tools to build the prototype for mobile applications that allow a smooth process of moving from static mockups to interactive prototypes [22],[23]. The Bahasa Melayu version has a similar interface design with English version except for the language usage in audio, video, and writing. Apart from that, the course purpose, course flow, learning materials, and strategy to deliver the knowledge is figured in this stage. The course flow and learning materials were referred from a well-known book in the digital marketing industry titled 'Digital Marketing for Dummies' by Ryan Deiss and Russ Henneberry [24]. The strategy to deliver knowledge successfully is by incorporating visual presentation and audios are shown in figure 2 below. Since this proposed mobile-based learning application is meant for elderlies whereby it is common for them to have poor eye sight, the design interface of each screen will include the UX Design principle to ensure that they get the best learning experience [14].
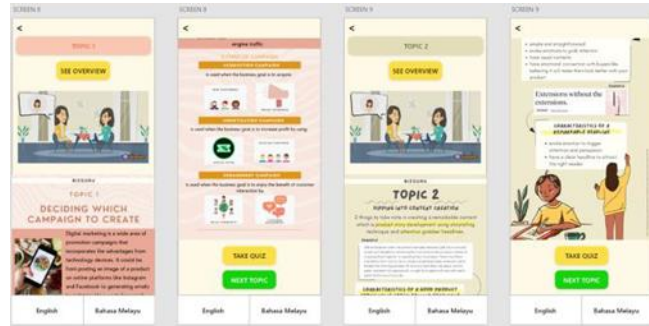
Fig. 2. Learning Screen

3.3 Development

Ionic5 was used as the programing tool to build the real application. Ionic5 is known for its cost-effective development with high speed performance and functionality, it has an open source feature, and uses simple programming language. This software uses Hyper Text Markup Language (HTML), JavaScript (JS) and Cascading Style Sheet (CSS). Next, Visual Studio Code (VSC) software was chosen as the platform to write and compile all the coding built for BizGuru interface design and functionality. The pages created in VSC consist of a subpage focusing on the layout and placement of element using HTML, another subpage focusing on the design, decorations, and styling using CSS, and subpages focusing on the functionalities using JS. Also, Windows Powershell was also used in giving commands for development purpose such as to include the Android Studio extension in Ionic5 project for testing the developed application using android emulator and build APK file of BizGuru. This APK file is a type of an executable file which is used to compile the mobile application and allow both the distribution and installation of application. Lastly, BizGuru learning materials as shown in figure 3, such as infographics and high-quality animation videos for every topic were developed using Canva and Animaker online software.
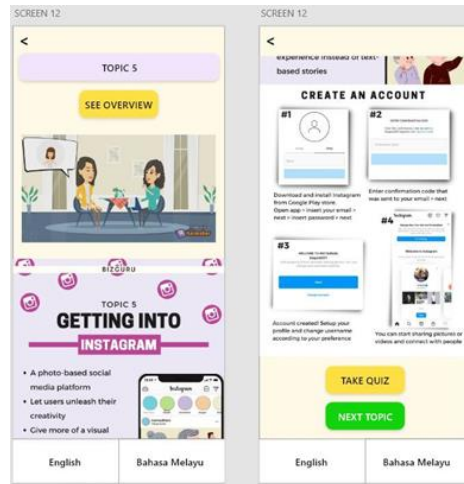
Fig. 3. Application setup with learning assessment

3.4 Implementation

As the cases of Covid-19 pandemic is steadily rising, the data collection procedure had to be transformed into the online method. Therefore, two different websites were created using cloud website builder that is meant for expert evaluation and pilot and usability test. These websites helped to organize the documents and materials needed to conduct the evaluation session. The respective website link was given to the evaluators and participants through e-mail or WhatsApp message. In the website, there is an introduction page for explaining the concept and purpose of study, briefing notes and instruction to perform the required task, informed consent form to explain the terms and conditions after they had agreed to participate in this study, a video demonstration of BizGuru app, a Google Drive link containing an APK file of BizGuru along with the poster guide to install the application, and a link to two different online evaluation forms created using Google Form to collect the ratings and comments given by the evaluators and participants.

3.5 Evaluation

There are three phases of evaluation session done in this study namely expert evaluation, pilot testing, and usability testing. Expert evaluation is a type of assessment that relies on the individual expertise in that particular area of study to discover the potential issues that have arisen in the mobile application [25]. Meanwhile, the pilot testing is an additional step that acts like a rehearsal phase

with a smaller number of participants before conducting the main study (such as usability testing) with a larger number of participants [26],[27]. Usability testing is the main research study aiming to test the system developed in real environment which requires the participants to perform, complete a task given, and provide feedback to the researcher [27]. BizGuru application overall performance was evaluated from an expert's and user's point of view. 3 expert evaluators with a strong foundation and knowledge in the technicality and usability of a mobile application interface design were recruited in this study. The instrument used in this evaluation session is known as Mobile Learning Usability Attribute Test (MLUAT) [28], [29]. Other than that, 7 retired elderlies (2 elderlies in pilot test, 5 elderlies in usability testing) had volunteered to participate in this study where they share a common characteristic of being an Android smartphone user. However, these elderlies are not experts in this field of study, as opposed to the expert evaluators. In fact, these elderlies are the target users who will use, learn and gain the knowledge from the mobile learning application developed. The instrument used in this evaluation session is known as System Usability Scale (SUS). The online evaluation form for MLUAT and SUS was created using Google Form with a 5-likert scale answer. The benefit of using 5-likert scale instead of 7 or more Likert scale is because it helps to produce a reliable quantitative data that is easy to be analysed, a universal method of data collection, and ideal method for a long questionnaire with multiple choice. Their ability to understand the functions in the mobile-based learning application was included in the feedback form. The usability and ease of use of the mobile-based learning application was measured throughout the entire interaction process and the feedback on the overall effectiveness of the proposed application to deliver the knowledge given.

4   Conceptual Process Flow and Model of BizGuru

A conceptual model is used to represent the whole process of a system. Flowchart is one of the best ways to show the overall cycle with a clear sequence of actions. The figure 4 below shows the flowchart of BizGuru mobile-based learning application.
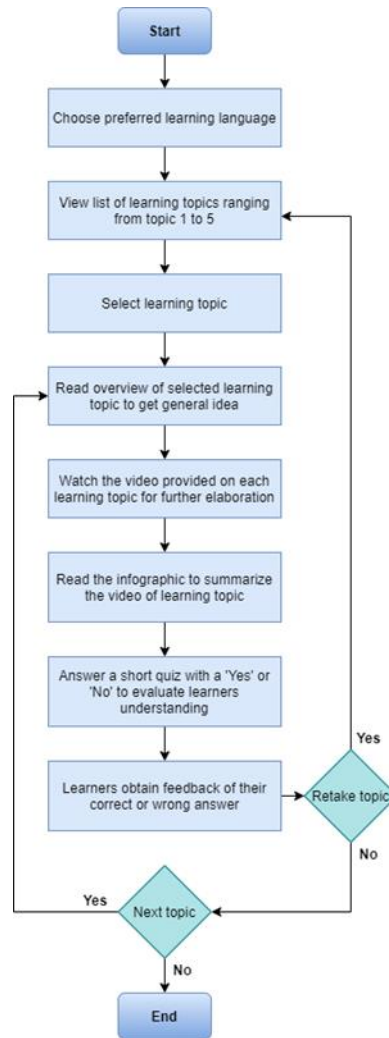
Fig. 4. Conceptual Flow Process

The BizGuru mobile-based learning application starts off with a splash screen welcoming the learners to use this application. Next, the learners need to choose their preferred language for learning. There are two different languages included in this application which is Bahasa Melayu and English. After choosing the language, the learners will be directed to another screen which shows all the learning topics available in this application ranging from Topic 1 to Topic 5. To start the lesson, the learner can choose any of the learning topics, preferably starting from the first

topic as it has a hierarchical order. On each learning topic, the learner will be provided with a short overview to give a brief idea of the learning topic and a video that will help in providing a more detailed explanation. After watching the video, an infographic is provided on each topic which will help the learners to summarize their understanding in visual and textual forms. After the learning process, the learner will be assessed with a short quiz to evaluate their level of understanding. The quizzes will be given after each learning process with a 'Yes' or 'No' answer. Then, the learners will obtain their results on the spot with the feedback that was set up to be provided after the learner tapped on the answer button. If the learner wishes to improve their understanding, they are allowed to retake the learning topic or otherwise, and then proceed to the next learning topic. In the next learning topic, the learning flow is all the same. Lastly, learners are allowed to exit or access the learning materials at any time.
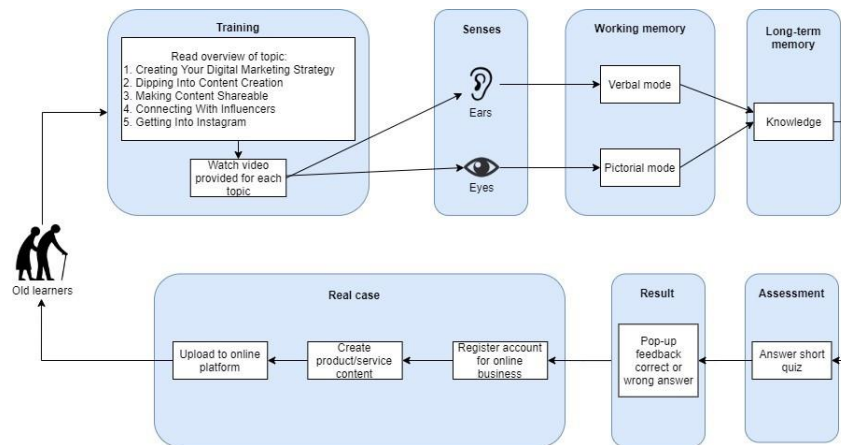

Fig. 5. Conceptual Model

The figure 5 shows the conceptual design of BizGuru mobile-based learning application. The target users of the proposed application are elderlies who seek for a lifelong learning opportunity. Firstly, in the training phase, the learners will access the learning materials by reading a brief overview of the learning topic. Then, as the elderly face some difficulties reading on the small screen for a long period of time, a video explaining on the related topic will be provided after each topic overview. The group will then use their senses to capture the information shown on screen. The information captured through the hearing sense will be kept in the working memory on verbal mode. Meanwhile, the information captured using the eyes will be kept in the working memory on pictorial mode. The valuable information will be interpreted into knowledge and kept in the long-term memory. Next, the learners will undergo an assessment phase which requires them

to answer a short quiz to test their understanding and evaluate the effectiveness of the mobile- based learning application in delivering knowledge. These quizzes are provided at the end of each learning topic. The answers chosen will be verified and the learners will obtain their results immediately in the form of pop-up feedback. Lastly, after completing the whole course, the learners can use the knowledge learned to apply to real cases. Learners can start their small online businesses using Instagram and promote their products using the digital marketing knowledge.

5   Findings and Discussion

Evaluation process proves to be a significant step in creating a new application system. The main notion of the system testing is to ensure that the system launched can fulfil the user requirement and satisfaction successfully. The testing must be conducted prior to the proposed application development to ensure that a better product can be obtained before the mass production.

5.1   Subject Matter Expert

The subject matter expert (SME) offers sound knowledge and expertise in a specific subject, business area, or technical area for a project [30],[25]. SME also makes sure that the facts and details are correct so that the project's/program's deliverable(s) will fulfil the stakeholders' needs, also the requirements of the legislation, policies, standards, and best practices. To assess the application, expert received the online link to do the testing on the application. The expert then answered the questionnaire provided. From the finding, the expert evaluator was given the questionnaire to answer the MLUAT evaluation. There are six parts in the evaluation namely visibility status, leaner control and freedom, match between the system and real world, consistency, error prevention, recognition rather than recall and minimize information on screen. The total score from all three expert evaluator feedback was calculated to be 95.93 and the average total score for BizGuru was 4.36. By referring to the 5-likert scale used, low values such as 1 and 2 represent a negative attitude meanwhile higher numbers such as 4 and 5 represent a positive attitude [31]. The average score (4.36) belongs to the higher value group which confirms that BizGuru mobile learning application had acquired a positive attitude from the expert evaluators in the expert evaluation phase, implying a good functionality and usability of the application.

5.2   Usability Evaluation

Usability testing and System Usability Scale (SUS) are the technique and

instrument used in the user testing phase- the practice of testing is the extent of the ease of use of the design, to be applied to a group of representative users. It entails an observation of users as they try to complete tasks and receive feedback from the users by way of interviews or questionnaires about user satisfaction on the product's prototype. According to Macefield [27], 5 to 10 respondents are the least number of respondents required for the usability testing. Nielson stated that elaborate usability tests denote a waste of resources, as the best results come from testing not more than 5 users and running as many small tests as possible [32]. This is due to the fact that when more tests are run on the user, the same results are to be obtained as the previous users where the first study with 5 participants is considered sufficient to find 85% of the usability problems. Therefore, 5 participants from elderly community are chosen at random to be part of the usability testing [33]. The feedback obtained will be gathered and analysed to be further improved in the application development. The SUS score per user was calculated to be 72.5, 77.5, 70, 72.5, and 75. All five users gave a rating of Agree [4] in question number 1 where they admitted that they would use BizGuru frequently. On the other hand, they also gave a significantly low rating on items depicted in questions 8 and 10 where they disagreed to the statement that BizGuru application was cumbersome to use, and they also disagreed to the statement whereby they needed to learn a lot of things before using BizGuru application. These questions are illustrated as negative questions, thus they received low ratings, depicting that BizGuru is easy to use. Besides, the average SUS score for BizGuru was calculated to be 73.5 (Grade B) which is considered as a good application, although it still requires an improvement on certain areas.

5.3   Related Theory and Methodological

The Self-directed learning and Andragogy theory was embedded in developing this application. Both theory defines adult learning as unique and different from general learning. It remarks that the elderly was classed as independent learners since they have a sense of responsibility from their life experiences. By looking at the facts, adults spend more time acquiring specific skills, which can be performed through reading, listening, observation, reflection, and exercise [15]. BizGuru 1.0 is an efficient device that combines learning material related to quail farming in a single platform. It is believed to be more efficient than the traditional website or book as the user can readily download the application and learn independently, which is referred from the theories embedded. The SDL theory describes a process where an individual takes the initiative in learning, including the learning materials and strategies, and evaluates the outcomes. It is opposite to teacher-directed learning or "pedagogy," which is considered an information transfer influenced by the outer in determining the learning outcome.

According to Farage et al [14], the age factor plays a role in the physical changes

of a person; therefore, a design guideline is referred to achieve the satisfaction level of users. In this study, to meet the elderly needs, the universal design principle related to the elderly is referred to in measuring the achievement of the development application. The most common decline in the elderly is the visual field; thus, color choices are essential in accommodating age-related visual impairment. The long-wavelength or "warm" colors are preferred to convey information that differs from the background. Simplicity is the word best defining the visual display, where the essential information is presented in a noticeable and uncrowded field. Short and precise learning materials matter as the degree of working memory in the elderly is shorter than in young adults. An application with complex information will create an overload of information to be processed for the elderly.

ADDIE, an Instructional System Design method [19] was embedded in the development of BizGuru 1.0. It is intended to solve a problem by developing and evaluating IT artefacts ranging from software, formal logic, or natural language. In this study, the issue of poverty among the elderly is chosen. ADDIE involves a process that enables an understanding of the problem addressed and the feasibility of the possible solution. BizGuru was made to disseminate information on digital marketing efficiently and to ease the learning for the target user (the intention and usefulness). In the hope that this application would help the target user to gain income from initiating their quail farming and business (the benefits). It aligned with the ADDIE method concerning the artifacts' intention, usefulness, and benefits. The expertise and target user were involved implicitly during the evaluation to receive direct feedback and to test the perception of the usefulness of proposed mobile based learning application. The most time-consuming process in this study is design and development, which is carried out non-stop even after evaluation. The feedback received during the evaluation will be considered, and changes to the application will be made.

6   Conclusion and Future Work

BizGuru is developed from the analysis of the weaknesses or disadvantages found from previous mobile learning application studies conducted from 2014 to 2019. The improvement has been made to provide a better learning experience for the old learners which also help to boost their cognitive skills and well-being by experiencing what is termed as 'quality ageing'. Besides that, the development of BizGuru which focuses on tending to the needs of the aging learners also helps to fulfil the 4th goal of Sustainable Development Goals (SDG) that is to provide a life-long learning opportunity [8]. As this mobile learning application promotes a digital marketing knowledge, the retired learners can take this opportunity to make it as an alternative to gain side income to continue supporting their living expenses in later life using technology devices. This benefit also helps to fulfil the 1st goal

of SDG that is to eradicate poverty issues among the elderly group. Besides, there are a few limitations found in this study- for one, conducting the usability testing remotely amid the Covid-19 pandemic had caused the application designer to be unable to observe the users directly during the testing and evaluation process to get a more detailed remark and experience. There was also a language barrier issue, as one of the users in the usability testing phase had commented that it would be better if there is a Chinese version in the BizGuru mobile learning application. This is due to the differences of races available in Malaysia and the daily language usage by the participants. Hence, future studies are recommended to improve the functionality of the mobile learning application by connecting to a database which will allow a bigger space for learning contents and also record the learners' progress. By implementing a database architecture [34], it will also allow the application developers to monitor the learners' learning curves based on their achievements in the quiz section. Apart from that, the future mobile learning application should improve the cloud security features by adding specific mechanism for a slot registration and log-in page [35]. This will instill the learners with a sense of belonging and security, as their learning progress is kept confidential to themselves without exposure to other learners. Not all learners are comfortable sharing their achievements with other learners, especially the competitive and introvert ones. Lastly, by having an authentication page, it allows multiple users per device, and this means that the number of learners and users of the respective mobile learning application can increase.

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