PREFACE

The SIG CS@e-Learning committee sincerely appreciates the dedication and contributions of the educators from Jabatan Sains Komputer & Matematik (JSKM), UiTM Penang Branch, in bringing the 9th edition to fruition. This edition received 30 scholarly articles, all of which met the required criteria and were accepted. Authors are encouraged to further refine their research with additional insights and discussions for potential publication in high-impact journals indexed by SCOPUS, WOS, or ERA.

The theme for the ninth volume, "Beyond Boundaries: The Multidimensional Horizons of E-Learning," reflects the continuous evolution of digital learning. Over the past few decades, e-learning has proven to be a transformative force in education, demonstrating exceptional adaptability and effectiveness. The widespread use of mobile technology has expanded its reach, making e-learning an essential component not only in higher education and vocational training but also in primary and secondary education. Emerging trends such as artificial intelligence (AI), micro-credentials, big data, virtual and augmented reality, blended learning, cloud-based platforms, gamification, mobile learning, the Internet of Things (IoT), and online video are reshaping the digital learning landscape.

SIG CS@e-Learning remains dedicated to fostering academic excellence through impactful publications. With continuous commitment and innovation, we aspire for JSKM to attain recognition in esteemed academic journals, further advancing the frontiers of e-learning.

Ts. Jamal Othman
Chief Editor
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THE DEVELOPMENT OF E-GEO APPLICATION FOR FORM SIX STUDENTS

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ABSTRACT

The project highlights the modelling of a mobile e-learning platform specifically designed for Form 6 students. The project arises from the limitations of the traditional formula-based technique affordable to students by didactic lectures, non-interactive studying material, and no provision for customized learning opportunities. Through the incorporation of media including videos, animation, quizzes, and drag-and-drop exercises, E-Geo aims to stimulate a high degree of student engagement and deepen their understanding of difficult geographical notions, weathering and climatic systems, in this case. The design uses the ADDIE Model to provide a structured framework through the processes of the analysis, design, development, implementation, and evaluation. E- Geo contains content in line with the form-6 STPM Geography syllabus, further divided into modules addressing important topics together across all three semesters. In addition, E-Geo introduces game element types, like recognition badges, and progress tracking, to motivate the students and create a more interactive learning environment.

Keywords: development, E-Geo, Form six, e-learning, ADDIE Model

Introduction

Interactive e-learning offers students a more adaptable, customized, and engaging educational experience, supported by digital media technology and big data systems (Huang et al., 2024). Students today customize their learning experiences to fit their unique needs, interests, and learning preferences. By concentrating on subjects where they require additional help, students can connect more profoundly with the content. Adaptive content is a strategy that allows students to personalize their learning experience, enabling them to concentrate on the subjects they need to study the most. This method has become increasingly favored, as it allows learners to progress at their speed and provides teachers with an effective means to evaluate student achievement.

Geography subjects has been perceived as a difficult subject in the school curriculum that is difficult to teach. Students also find it difficult to get illustrative images from several topics involving elements such as weather and climate elements, radiation and drought as well as heat budgeting. Students also face delayed feedback from their teachers on the questions that they do not understand on certain topics. This happens when students do exercise on their own without guidance. Moreover, teachers may be overwhelmed by the volume of student questions, especially if they have a large class size. The thick and detailed nature of Form 6 Geography textbooks can also be challenging for students.

Animated learning applications can be one of the good teaching aids to deliver subject content like Geography. In general, most Android learning applications which were developed for assessing students to understand more on a certain topic can involve a prolonged process and some of them need to be attended to physically which can cause trouble for teachers and students. (Othman et al., 2022). Therefore, this application will be developed to improve form 6 students understanding of certain hard topics each semester. This project simplifies the learning process by applying interactive elements like drag-and-drop, quizzes, Animation, and multimedia that covers related topics to increase students' interest in Geography subjects. Animation plays a vital roles as an existing learning medium. This is because the visual form of the mobile is accompanied by audio that can be used to explain the content of the lesson that is difficult to convey (Rohana Mansor et al., 2020).

Project Framework

This project employs the ADDIE model as a framework to model the design and development of a mobile e-learning application for Form 6 Geography students. The ADDIE model provides an avenue for solving the existing educational issues in a stepwise manner and makes an engaging and interactive learning platform. ADDIE model consists of 5 phases which are Analysis, Design, Development, Implementation and Evaluation. Figure 1 shows the 5 phases in ADDIE model.

This analysis phase involves analysing the needs of Form Six Geography students, identifying learning gaps and challenges they face with specific topics across each semester (Pinem & Nurahmi, 2024). It also evaluates the educational goals and objectives of the E-Geo application to ensure alignment with the curriculum. Research on user personas and the target audience is essential in defining the functional requirements of the application.

The design phase consists of the structure and features of the E-Geo application. This process involves designing wireframes for the user interface (UI) as well as sketching the flow for lessons, quizzes and other learning mechanisms. The design will focus on being intuitive and user-friendly, with engaging elements such as interactive maps, videos, and assessments (Suratnu, 2023).
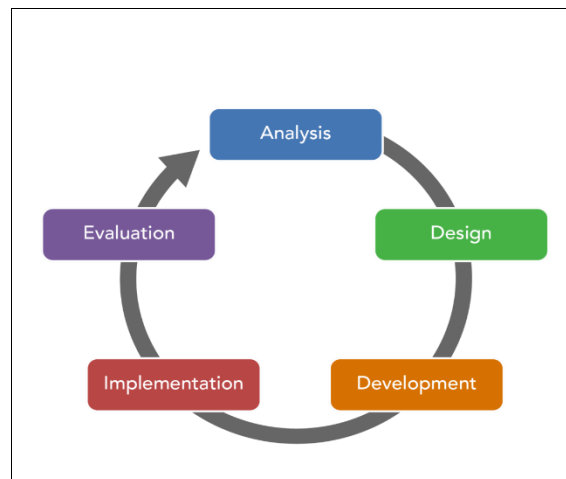
Figure 1: The ADDIE Model (Source: Lumen Learning, 2019)

This development of the E-Geo application includes scripting, engaging features, and event handling. In this phase, iterative testing will be done on this application to make sure that all features are working as intended (Hess & Greer, 2016).

The implementation phase ensures the successful deployment of the E-Geo application, focusing on engaging Form Six Geography students and addressing their learning needs. This phase involves usability testing, providing user guides, and offering interactive tutorials to help students navigate and use the app effectively. A user-centric approach is adopted, prioritizing student feedback and making real-time adjustments to enhance the learning experience.
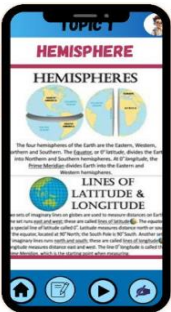
Finally, in the evaluation phase of the ADDIE model for the "E-Geo" application, the primary focus will be on determining its effectiveness in achieving educational goals and supporting Form Six Geography students. This will include collecting feedback from students and teachers through surveys and interviews, analysing student performance before and after using the app, and examining usage data to pinpoint areas for improvement. Teachers will offer insights into how well the app aligns with the curriculum. Additionally, technical testing will ensure the app operates smoothly across devices, providing valuable guidance for future updates to enhance its functionality and effectiveness (Nainggolan et al., 2023).
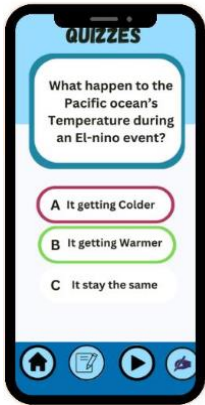
Prototype

Designing the storyboard is important to understand the flow of the system. Storyboards represent visually the arrangement of events, activities, or steps in a project. It consists of a number of illustrations, images, or sketches of the flow of an idea or system. Nevertheless, a user-interface design shows more detail features of the proposed system.

Table 1: Prototype Science Courseware for Standard 6 students

No	Features	Description
1	Cover of E-Geo Application	This cover page of the E-Geo application consists of a log-in button for users to continue to the next page. New users can also register a new account to use the application.
2	Login Page	The current user needs to enter the email and password every time to log in to the E-Geo Application and proceed with the login button to move to the homepage.
3	Register Page	Register page allow new users to fill a few details to complete the registration of a new account by using email, password, and confirm password. Users can continue to log in as usual to explore the application.
4	Home Page by Semester	Homepage by semester appears after the user successfully login. This page consists of three selection buttons for each semester which are semesters 1,2 and 3. At the bottom page have 4 buttons that bring other content in this app which are quizzes, notes, video lessons, and the home button.

5	Home Page by Content Category	This E-Geo application contains 4 education elements which are video, quiz, notes, and exercise for Form Six Geography students. Users can click any available button to explore the content
6	Video Content Page	This video page focuses on the related topic of form six geography so students can just click on the play button to watch the video.
7	Notes Content Page	The note page has an interactive feature consisting of a few notes on an important topic that can help students structure the description of the long topics.
8	Notes by Topic Page	This is the page after the user click on the selected topics available. These notes contain the perfect details and figures to explain any process involved in the topic selected for example Hemisphere

9	Quizziz Page	This page prepares interesting quizzes to increase user engagement. Users just need to choose the available answer in shown in the figure. The green oval will appear surrounding the correct answer while a red oval will appear on the wrong answer.

Conclusion

The development of E-Geo Application for Form 6 students provide a thorough approach with its educational goals, setting a strong foundation for wider adoptions. This project followed the five phases of the ADDIE Model: Analysis, Design, Development, Implementation, and Evaluation. Each phase played a vital role in structuring and effectively developing the E-Geo application. The project materials and processes were outlined step-by-step to ensure a smooth and efficient development workflow.

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