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THE DEVELOPMENT OF SCIENCE COURSEWARE FOR STANDARD SIX STUDENTS

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ABSTRACT

E-learning system has become one of the most significant platforms to achieve the vision for wide range, lifelong training to a wide variety of audiences. Thus, the development of Science courseware for standard 6 students is actually to prepare the student for specialize exam such as PKSK and UKKM. Standard 6 students are affected by limitations in traditional teaching methods, limitation integration of technology and difficulties in maintaining student focus. The development of the Science courseware utilizes interactive, and technology driven approaches to offer personalized learning experiences, incorporating features such as self- assessment resources, interactive experiment and gamified content to enhance engagement and attract student attention. By integrating technology into education, the proposed solution aims to assist students in understanding science concept, addressing their shortcomings and enhancing their preparedness for examinations.

Keywords: development, Science courseware, Standard six

Introduction

E-Learning is the delivery of educational content and experiences through digital platforms, providing flexibility in time and location for learners. Bates (2019) stated that e-learning is crucial in modern education as it encourages self-directed learning and accommodates various learning preferences It often uses multimedia resources, interactive content, and online assessments to enhance learning outcomes. This approach enables learners to access study materials, complete assignments, participate in discussions, and take exams online. Because it enables students to actively engage in learning at any time and from any location, e-learning delivers positive learning outcomes. Thus, a courseware that focuses on science can be very helpful for students to prepare efficiently. The aim of this e-learning courseware is to help Standard 6 students to prepare efficiently for Pentaksiran Kemasukan Sekolah Khusus (PKSK) and Ujian Kecenderungan Kemasukan MRSM (UKKM) exam.

The PKSK stand as a standardized exam in Malaysia for students applying to specialized schools such as Sekolah Berasrama Penuh (SBP) and Sekolah Menengah Kebangsaan Agama (SMKA).

The PKSK evaluate students based on their academic skills, critical thinking skills, and personal attributes to identify individuals suitable for advanced educational programs. Getting ready for PKSK typically requires concentrated learning on key topics, such as science, to ensure that students meet the high standards expected in these institutions.

While the UKKM is an exam created for students to enter Maktab Rendah Sains Mara (MRSM). It evaluates students in fundamental academic subject like Science, Math, and English, along with personal and social skills. Preparation for UKKM highlights the importance of comprehending science, particularly in zreas that require critical and analytical thinking (Azizan & Nor, 2021).

The traditional method in education involves teachers who provide lessons and students participating in lectures, textbooks, and workbooks provided by the government. In traditional classroom, one-size-fits-all strategy method is frequently employed in which the educator managing the lesson's speed and material without customizing it to suit individual learning requirements. Because of this, some students find it difficult to keep up, and others can find the pace excessively slow, which causes them to become disengaged.

To overcome the traditional method, the development of Science courseware for Standard 6 students is done by identifying the requirements for a Science subject courseware for PKSK and UKKM Preparation for standard 6 students besides evaluating the functionality and usability of the Science subject courseware for PKSK and UKKM Preparation for standard 6 students.

Project Framework

This project uses the ADDIE Model framework to organize the development of the Science courseware for standard 6 students. The ADDIE model is a systematic, well-recognized instructional design framework that helps in developing efficient learning experiences. This model is a well-established methodology for information transfer in adult education, and it has been widely utilized for the production of multimedia learning content. The ADDIE model is a widely utilized instructional design framework that represent Analysis, Design, Development, Implementation, and Evaluation. It is a repeated process that guides the development of productive and efficient educational experiences, especially in online learning environments. Every phase of the ADDIE Model has a distinct aim in guaranteeing that the educational content is thoughtfully designed, focused on the user, and oriented toward specific goals. Figure 1 shows the five stages in the ADDIE Model.

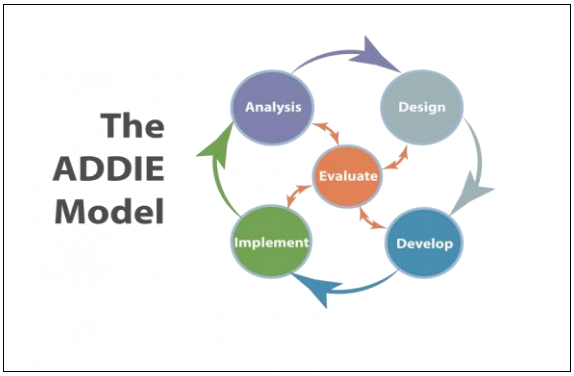


Figure 1: The ADDIE Model (Source: Capytech, 2025)

The Analysis phase is where the instructional designers focus on the learning needs, goals, and objectives. This would require an understanding of the learner backgrounds, the content to be taught, and finally, the context in which the e-learning will occur. This phase is important in e-learning for identifying technology requirements, learner preferences, and resources available (Clark & Mayer, 2018). Analysing the needs of Science Courseware for Standard 6 students is important to identify their learning gaps and setting specific goals for the courseware.

The design phase outlines the structure and strategy for the e-learning course. This involves making the content interesting and aligned to the user needs and learning objectives (Molenda, 2019). Designing the structure of the Science Courseware is crucial, including the multimedia elements and how they support learning.

Development phase might include constructing e-learning modules, interactive components, testing them for functionality and usability. It ensures that the learning experience is interactive and easily accessible while being technically sound. It means developing the science courseware, programming interactive components, and embedding multi-media features to provide a rich learning situation.

During implementation, the program is delivered to students. This e-learning phase include launching the course, providing access to learners, and assisting them through the learning process. In e-learning, effective implementation means ensuring a user-friendly platform and necessary tools and support for the learners (Stevens & Tate, 2020). This phase would involve testing the courseware with a small group of students from Standard 6 and gathering feedback to improve the learning experience.

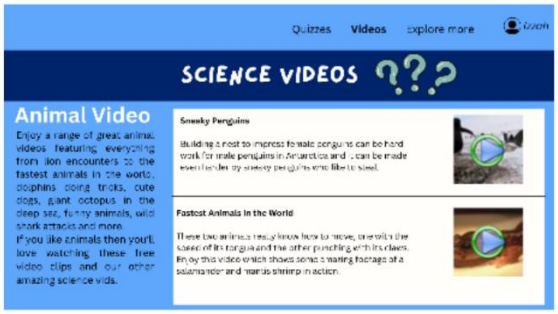
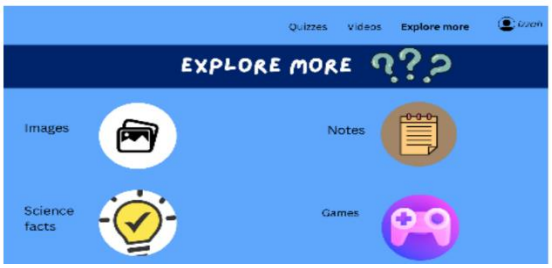
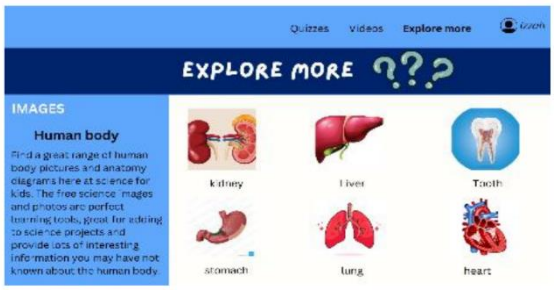
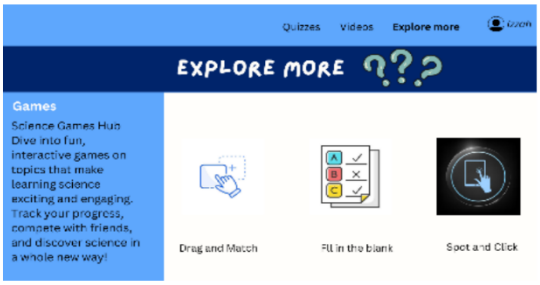
Finally, the evaluation phase is to identify the effectiveness of the system. It gather feedback from the learners, instructors, and stakeholders to determine whether the intended learning outcomes have been achieved. In this way, evaluation can be formative during development and summative once the implementation has happened (Morrison et al., 2019). To assess whether the courseware was actually successful, it would be important to consider how well it prepared students for their exams and perhaps how much understanding of science it developed.

Prototype

Designing the storyboard is important to understand the flow of the system. Storyboard will represent visually the arrangement of events, activities, or steps in a process or project. It consists of a number of illustrations, images, or sketches of the flow of an idea or system. The storyboard captures the sequence of lessons, interactive quizzes, videos, and other multimedia elements. 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	Home Page 	This Home Page introduces the platform with the tittle "Science Courseware for You!". It features vibrant illustrations like rockets, atoms, microscopes, and test tubes to create a fun and engaging science-themed atmosphere. The navigation bar at the top allows access to sections like Quizzes, Videos, and Explore More.
2	Main Menu Page 	This page presents a collection of Science quizzes categorized by topics of Standard 4, 5, and 6. Each category represents by an image that helps in visually connect users to the topic, enhancing engagement and easy to navigate. User can click on the image and it will navigate to each topic page.
3	Quizziz Page 	This page shows questions along by four answer option. The layout includes an eye-catching picture to visually support the question. The navigation menu at the top enables users to switch to different sections. The layout is clean and interactive, motivating users to participate in the quiz.

4	Video Content Page 	This page is the Science Videos section, specifically focusing on Animal Videos. The page includes an Introduction Section and Video Listings. Each video comes with a title, description, and a thumbnail that has a play button for easy access.
5	Explore More Page 	This page represents four groups of addition science resources such as images, notes, science facts and games. The page uses clear icons for each category and a simple layout, making it easy for users to explore and access these resources
6	Image Content Page 	This Image Content Page focus on the Human Body. It offers visual materials, including anatomy diagram of important organs. The page offers an interactive approach for user to learn about human anatomy. A short explanation explains the purpose of the images.
7	Notes Content Page 	The Notes Content Page provide brief summaries for science topics. It includes diagrams and glossaries to make learning easy and interactive for users.
8	Games Content Page 	This page shows an interactive science-themed games such as Drag and Match, Fill in the Blank, and Spot and Click. Its aims to make science education enjoyable. The simple layout ensures ease navigation and engagement.

Conclusion

The development of Science Courseware for Standard 6 students is a great approach for the preparation of PKSK and UKKM. The system development follows the 5 phases in the ADDIE Model which are analysis, design, development, implementation and evaluation. The learning objectives, student needs, and system requirements were identified during the analysis phase. The design phase translates these insights into detailed plans, including content structure, user interface, and assessment strategies. The development phase focuses on creating the courseware, incorporating multimedia elements, interactive features, and assessment tools. Effective testing and teacher training is being done in the implementation phase. The evaluation phase involves measuring usability and functionality to get relevant feedback to improve the courseware continuously. This ongoing iterative cycle makes the courseware effective for creating good user experience and impactful in preparing students for PKSK and UKKM assessments.

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