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PIONEERING EDUCATIONAL PERSPECTIVES

Series 2025

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Series 2025

Chief Editors:
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Preface

Pioneering Educational Perspectives: Series 2025 is a collection of thought-provoking insights and research contributions exploring contemporary educational trends and practices. This eBook presents a diverse range of perspectives on innovative teaching methodologies, digital learning strategies, and transformative approaches in education. Designed to serve as a resource for educators, researchers, and practitioners, it aims to inspire meaningful discussions and advancements in the field. Through carefully curated chapters, this publication offers fresh ideas and practical solutions to enhance learning experiences in an ever-evolving educational landscape.

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THE MAGICAL JOURNEY INTO THE WORLD OF RENEWABLE ENERGY: AN AI-DRIVEN EDUCATIONAL VIDEO FOR POWER SYSTEM COURSE IN POLITEKNIK MALAYSIA

Kaliyamah Raman*, Norazlinda binti Mohamed, Eddyzulham Abu Bakar, Shaiful Bahari Mohamad Norani & Syazaliah binti Salim

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ABSTRACT

This project centres on the development of an AI-generated animated video titled The Magical Journey into the World of Renewable Energy, aimed to student Electrical Engineering Programme with courses Power System (DET30053) at Politeknik Malaysia. The video introduces key concepts of renewable energy, including solar, wind, and hydroelectric power, using a story-driven approach that engages students visually. AI tools such as ChatGPT were used for storyboarding, Canva for image generation, Runway AI for animation and lip-syncing, and Veed.io for text-to-speech narration. Adobe Premiere Pro was employed for final editing and adding multilingual subtitles. By simplifying complex engineering concepts and presenting them through visual storytelling, the video enhances student understanding and retention. It provides an interactive learning experience, helping students grasp the practical applications of renewable energy in a more engaging and accessible way. This method caters to diverse learning styles, making technical content easier to understand, especially for visual learners. The AI video thus improves comprehension and supports more effective learning outcomes, showcasing how AI can transform traditional educational methods in technical subjects.

KEYWORDS: AI-Generated Animation, Renewable Energy, Interactive Learning Tools, Visual Storytelling, Technical Education Enhancement

PROBLEM AND OBJECTIVE

Renewable energy is an essential topic in modern engineering education, especially as global energy needs increase and environmental concerns demand a shift toward sustainable energy sources. However, renewable energy concepts, particularly solar, wind, and hydroelectric power, can be challenging for students to visualise and understand. Conventional teaching methods often fail to engage students in meaningful ways, leading to difficulties in grasping complex engineering principles (Twidell & Weir, 2020).

The objective of this project is to develop an innovative educational tool using AI technology. The video titled "The Magical Journey into the World of Renewable Energy" aims to make the learning process more engaging and effective for electrical engineering students at Politeknik Malaysia. The project simplifies complex renewable energy concepts by using animated visuals and a story-driven approach, providing students with a clearer understanding of how these energy systems operate in the real world.

DESIGN DESCRIPTION

The design of The Magical Journey into the World of Renewable Energy revolves around an animated educational video tailored for electrical engineering students in the Power System

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course (DET30053) at Politeknik Malaysia. The primary purpose of this video is to simplify and visually represent complex renewable energy concepts—solar, wind, and hydroelectric power—in a manner that enhances student comprehension and engagement.

Features and Functionality
To provide an interactive and visually engaging learning experience that clarifies how different renewable energy systems operate.

- Story-driven Format: Students follow a narrative journey with their teacher and peers exploring various energy sources.
- AI-Generated Animations: Utilises AI tools to create dynamic visuals of solar panels, wind turbines, and hydroelectric dams.
- Text-to-Speech Narration: Offers clear and consistent narration, enhancing accessibility.

Target Audience
Electrical Engineering Students: Specifically designed for students studying Power Systems, aiding their understanding of renewable energy systems.

Advantages and Highlights
- Integration of AI Tools: Employs advanced AI technologies for storyboarding, animation, and narration, offering a modern, interactive educational experience.
- Multilingual Accessibility: Provides subtitles in Malay language, making the content accessible to a wider audience.
- Visual and Interactive Learning: Combines visual storytelling with technical education, making complex concepts more approachable and engaging.

This design effectively bridges the gap between theoretical knowledge and practical understanding, making it a valuable educational resource.

VISUALS

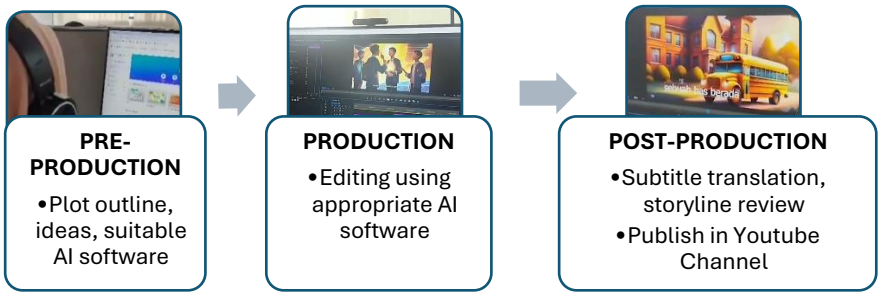


Figure 1: Workflow of the Video Production Stages

Pre-Production
In the pre-production phase, initial ideas were generated, and a plot outline was developed. The most suitable AI tools were identified for the project. Canva AI was used to create animated images, including those of the teacher, school bus, students, solar farm, wind turbine farm, and hydro dam.

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Figure 2: Screenshot of ChatGPT Interface Used for Storyboarding



Figure 3: Image Generated by Canva AI

Production

During production, the plot outline and ideas were implemented using the chosen AI software. Editing was carried out with Adobe Premiere Pro 2024, based on the storyboard. Existing images were animated using Runway AI, and the voice-over was generated using Veed.io.

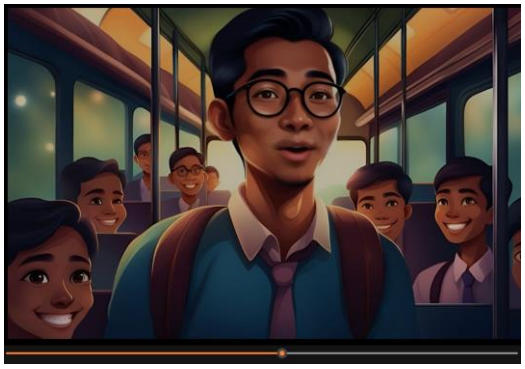


Figure 4: AI-Generated Image of Teacher Explaining Concepts

Post-Production

In post-production, subtitles were translated, and the storyline was reviewed. The final video was then published on a YouTube channel.

NOVELTY AND UNIQUENESS

The key innovation lies in the integration of multiple AI-driven tools to produce an engaging, story-based educational video. Unlike traditional teaching methods, this video uses advanced AI technologies to generate images, animations, and synchronised lip movements, all within a unified design. The AI-powered animation adds a dynamic, interactive dimension to learning, making technical content more digestible (Luckin et al., 2016). Furthermore, the project integrates multilingual subtitles, expanding accessibility for non-English-speaking students. This adds a level of inclusivity that is rarely seen in standard technical educational materials.

BENEFITS TO MANKIND

Educating future engineers about renewable energy has long-term benefits for society. By making these concepts more accessible, this video supports the transition to a more sustainable energy future. As students gain a clearer understanding of renewable energy systems, they become better equipped to contribute to environmentally friendly engineering solutions. The use of AI to produce this educational content also points to the broader potential of artificial intelligence in addressing educational challenges (Boyle, 2017).

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COMMERCIAL POTENTIAL

The potential for commercialisation exists in several key areas:

- Educational Licensing: The video could be licensed to other educational institutions, both in Malaysia and internationally, as part of their renewable energy curriculum.
- Customisation Services: The AI-driven approach can be adapted to create educational content for other topics in science, technology, engineering, and mathematics (STEM).

CONCLUSION

The Magical Journey into the World of Renewable Energy represents a novel approach to STEM education, combining AI-driven content creation with innovative animation techniques. By visualising the mechanics of solar, wind, and hydroelectric energy, this video enhances students' understanding of key engineering concepts. The integration of AI technology not only improves educational content but also makes it more scalable, customisable, and accessible. This project serves as a model for future educational tools, contributing to the broader goal of sustainable energy education.

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