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# PIONEERING EDUCATIONAL PERSPECTIVES

Series 2025

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## Series 2025


Chief Editors:
Nur Alyani binti Khairol Anuar
Muhammad Irfan bin Mokhtar

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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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Muhamad Arrysydi bin A Rizal[1], Suhanah Rosnan[2,*] ..... 316

FOCUSENIGMA - UNLOCK THE MYSTERIES OF MASTERFUL ATTENTION ..... 320

Choong Zhuo Lin[1,*], Shakirin Ahmad Bakary[2], Ho Chun Yi[3], Wong Yi Cheng[4] & Cheong Lip Ken[5] ..... 320

ELYWARE: AN APP DESIGNED TO STREAMLINE STUDENT AND LECTURER MANAGEMENT... 324

Sri Raj Jegan, Fitri Hazim Bin Bahrin, Nezsarn Sivanesan, Maisara Binti Mohamed Redzuan ,Nur Aleeya Binti Zulkapli &Nurul Husna Bt Mat Zaki ..... 324

AI-BASED TEACHING ASSISTANT (SMART TUTOR) ..... 328

Abdul Rahim Mohd Sobri[1],*, Ahmad Affandi Danial Nasri[1], Siti Arnasha Azman[2], Fauzan Iliya Khalid[2] & Sevakumar A/L Batumalai[2] ..... 328

RAJAH RAMA-RAMA : ALAT MEMPELAJARI KATA TUNJUK BAHASA ARAB ..... 332

Nida Nazifah Azmi[1], Siti Nurmaisarah Fkhururazi[2]*, Siti Fatimah Mohamad Radzi[3], Munirah Azrae[4], Farhana Idris[5]..... 332

THE MAGICAL JOURNEY INTO THE WORLD OF RENEWABLE ENERGY: AN AI-DRIVEN EDUCATIONAL VIDEO FOR POWER SYSTEM COURSE IN POLITEKNIK MALAYSIA ..... 335

Kaliyamah Raman*, Norazlinda binti Mohamed, Eddyzulham Abu Bakar, Shaiful Bahari Mohamad Norani & Syazaliah binti Salim..... 335

EXPLORING HISTORY THROUGH TIKTOK AS A MODERN LEARNING TOOL ..... 339

Syaimak Ismail[1*], Muhammad Saiful Islam Ismail[2] ..... 339

e-ISBN: 978-967-0033-31-0

# AI-BASED TEACHING ASSISTANT (SMART TUTOR)

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**ABSTRACT**
This research focuses on developing SMART TUTOR, an AI-based teaching assistant powered by the Gemini language model, designed to support college students by offering personalized learning assistance in both casual Malay and English, complete with emoji integration. This study is important as many students face language barriers and difficulty understanding formal terms in traditional educational materials, hindering effective learning. Current AI systems lack cultural and linguistic adaptability, especially in bilingual or informal communication settings. The research aims to address this gap by developing a chatbot web application that uses a Restful API to provide real-time, conversational learning support. Through user-centered design with HTML, CSS, and JavaScript, and by analyzing interactions between students and the AI assistant, the study demonstrates how casual language and emojis can improve engagement and understanding. SMART TUTOR also holds strong commercial potential, particularly for higher institutions, where the majority of students prefer learning tools that align with local language and culture. By providing a flexible AI solution that can be added to education systems, SMART TUTOR meets the rising need for personalized digital learning. Key findings suggest that students benefit from a relaxed, approachable AI interface, which enhances their learning experience. This research contributes to educational technology by offering an accessible, culturally relevant, and engaging AI solution for overcoming language barriers in learning.

**KEYWORDS:** AI-based teaching assistant, Gemini language model, Personalized learning, Natural Language Processing, Chatbox

## PROBLEM AND OBJECTIVE

Many college students, particularly in East Malaysia, face language barriers and struggle to understand formal terms and technical jargon in traditional educational materials (Ag-Ahmad & Lidadun, 2020; Kashinathan & Abdul Aziz, 2021). This language barrier hinders effective learning, engagement, and comprehension. Current AI-based teaching assistants are limited in their ability to communicate casually in bilingual formats and lack cultural adaptability, leaving students with limited access to personalized, relatable educational support (Sadikoğlu et al., 2023).

The primary objectives of SMART TUTOR are:

1. To develop a SMART TUTOR using the Gemini language model that provides personalized learning assistance in casual Malay and English.

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2. To provide real-time conversational support that helps students to learn. 3. To engage students through the use of a friendly AI chat that incorporates informal language, emojis, and cultural relevance.

**DESIGN DESCRIPTION**

SMART TUTOR is an AI-based teaching assistant designed to enhance the learning experience for college students by offering personalized support in both casual Malay and English. The primary goal of SMART TUTOR is to address language barriers and improve comprehension of educational materials through a more approachable and culturally relevant interface. By integrating casual language and emojis, SMART TUTOR aims to make learning more engaging and relatable, providing students with a supportive and interactive educational tool.

The assistant features dual-language support, allowing students to receive help in their preferred language. It incorporates emojis to enhance interaction and make the content more relatable, which can help in bridging communication gaps and making learning more enjoyable. SMART TUTOR offers real-time, conversational support via a web-based chatbot application, built with HTML, CSS, and JavaScript to ensure a user-friendly experience. The system uses a Restful API for seamless interaction with the model, providing a cohesive learning experience.

Targeting college students who may find formal educational materials challenging, SMART TUTOR provides a more relaxed and accessible learning environment. It is also designed with higher education institutions in mind, offering a flexible solution that can be integrated into existing systems or provided as a subscription-based tool. This adaptability makes it a valuable asset for enhancing student engagement and learning outcomes.

Unique selling points of SMART TUTOR include its cultural and linguistic adaptability, which addresses the need for educational tools that respect and incorporate local languages and informal communication styles. The use of casual language and emojis aims to increase student motivation and retention, making learning more approachable and enjoyable. Additionally, SMART TUTOR has strong commercial potential, offering a scalable solution that can be customized for various educational contexts.

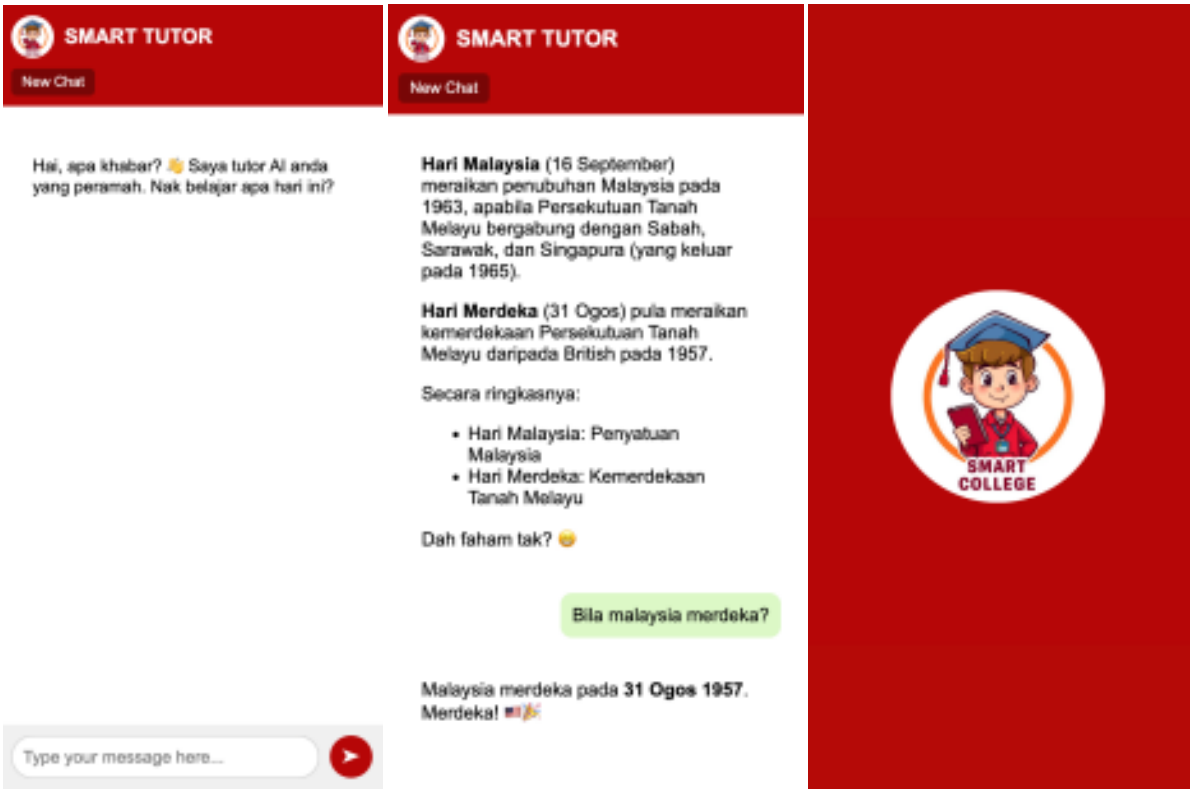
**VISUALS**

SMART TUTOR Interface Mockup

Figure 1 shows the homepage of the SMART TUTOR. The logo features a young boy wearing a graduation cap and holding a book, likely representing a student. This is set within a circular frame on a vibrant red background. The text "SMART COLLEGE" is placed below, clearly associating the visual with an educational institution.

Figure 2 and Figure 3 shows the chat interface of the "SMART TUTOR" app. A friendly AI tutor greets the user and asks what they would like to learn today. Figure 3 showcases how user can communicate with the SMART TUTOR by using Malay casual language.

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## NOVELTY AND UNIQUENESS

SMART TUTOR is a unique AI teaching assistant that supports college students with bilingual responses in casual Malay and English, making it more approachable and relatable. It enhances communication by incorporating emojis, adding a fun and modern touch to the learning process. The assistant uses a Restful API for seamless integration into web applications, ensuring flexibility and easy deployment across different platforms. The web-based chatbot, designed with HTML, CSS, and JavaScript, provides a dynamic and user-friendly interface, offering real-time conversational support and adapting to various subjects and topics, making it a standout tool compared to traditional educational systems.

## BENEFITS TO MANKIND

SMART TUTOR offers significant benefits by addressing language barriers and improving comprehension for college students through its bilingual, casual communication. By making learning more engaging with emojis and a user-friendly interface, it enhances student motivation and academic performance. This approach not only supports better educational outcomes but also fosters inclusivity and accessibility, helping students from diverse linguistic backgrounds succeed. Additionally, the scalable nature of SMART TUTOR allows it to be integrated into various educational settings, broadening its positive impact across different institutions.

## COMMERCIAL POTENTIAL

SMART TUTOR has strong commercial potential due to its unique bilingual, casual communication style, which differentiates it from traditional educational tools. Its use of emojis and a user-friendly web interface offers a competitive advantage by increasing student engagement and satisfaction. The scalable design allows for easy integration into existing university systems or as a subscription-based tool for broader accessibility. Business models

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could include institutional licenses or individual subscriptions, with cost analyses focused on development, deployment, and maintenance, ensuring affordability while addressing diverse market needs.

## CONCLUSION

In conclusion, SMART TUTOR provides an innovative solution to educational challenges by offering bilingual, casual language support and engaging communication through emojis. This approach effectively addresses language barriers and enhances student engagement, setting it apart from traditional educational tools. Its scalable design and flexible integration options present significant commercial potential, making it adaptable for various educational settings. Future directions could include expanding language options, incorporating advanced AI features for personalized learning, and exploring partnerships with educational institutions to refine and expand its impact. By continuously evolving and adapting to student needs, SMART TUTOR can further enhance educational experiences and outcomes.

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