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INTERNATIONAL SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

**INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION**

# **E-PROCEEDING**

## **EXTENDED ABSTRACT**

**UiTM** *di hatiku*

اوسها تقوى موليا

# **E-PROCEEDING**

## **EXTENDED ABSTRACT**



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## *Welcome Message*

**RECTOR, UITM KEDAH BRANCH**

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to extend my deepest appreciation to the organising committee of i-SPIKE 2025 for their steadfast dedication and commitment in making this prestigious event a reality. My heartfelt congratulations to the committee for their tireless efforts in ensuring that i-SPIKE continues to grow as a meaningful and impactful platform for academics, researchers, students, and industry players worldwide.

The theme for this year, “Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future,” is both timely and significant. It reflects our shared responsibility to not only embrace creativity and technological advancement, but also to ensure that innovation directly contributes to sustainable development, equitable education, and the well-being of future generations.

i-SPIKE 2025 provides a dynamic platform for showcasing innovations that address real-world challenges while opening new avenues for collaboration, engagement, and inclusivity. By bridging knowledge, innovation, and education, this symposium strengthens our collective capacity to design solutions that empower communities and inspire positive change.

I am truly impressed by the diversity and calibre of participants in this year’s event. The projects and ideas presented highlight the extraordinary creativity and determination of our innovators. I am confident that the insights and solutions shared here will pave the way for continuous advancement in teaching, learning, and innovation.

It is my sincere hope that you will find i-SPIKE 2025 an enriching experience, one that sparks new ideas, builds lasting collaborations, and strengthens our shared vision for a sustainable future. To all participants, I wish you every success, and to the winners, my warmest congratulations.

Once again, I thank the organising committee, partners, and contributors for their invaluable support. May i-SPIKE 2025 continue to inspire and empower minds for many years to come.

Professor Dr. Roshima Haji Said  
Acting Rector  
Universiti Teknologi MARA (UiTM) Kedah Branch

## *Welcome Message* (i-SPIKE 2025 CHAIR)

It is my great pleasure to welcome you to the 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2025 (i-SPIKE 2025). This year's theme, "Empowering Minds: Bridging Innovation, Knowledge, and Education for a Sustainable Future," reflects our collective commitment to advancing innovation and fostering meaningful collaboration across academia, industry, and communities.

i-SPIKE 2025 provides a platform for scholars, researchers, students, and practitioners from diverse fields to showcase their ideas, share knowledge, and inspire new solutions to global challenges. We extend our sincere appreciation to all participants and contributors whose efforts and dedication have made this symposium possible.

We hope that this e-proceedings serves not only as a record of the innovations presented but also as a valuable resource that continues to inspire long after the event.

Thank you.

Dr Junaida Ismail  
Chair

4th International Exhibition & Symposium on Productivity, Innovation,  
Knowledge, and Education 2025 (i-SPIKE 2025)

**PREFACE**

The 4th International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education (i-SPIKE 2025) marks yet another milestone in our ongoing commitment to fostering innovation, creativity, and collaboration across disciplines. Guided by this year's theme, "Empowering Minds: Bridging Innovation, Knowledge and Education for a Sustainable Future," the event provides a dynamic platform for students, educators, researchers, and professionals to share their ideas, showcase their innovations, and engage in meaningful knowledge exchange.

This year, we are pleased to report that i-SPIKE 2025 received approximately 50 initial submissions, with more than 35 projects successfully advancing to final presentation and exhibition. These projects reflect a rich diversity of innovation, ranging from educational technologies, digital applications, and gamified learning tools to sustainable materials, cultural heritage preservation, and community-focused solutions. Collectively, they embody the spirit of bridging innovation and education to address pressing societal and global challenges.

We sincerely thank all participants, reviewers, and committee members for their invaluable contributions in making i-SPIKE 2025 a success. It is our hope that this e-proceedings will not only serve as a record of the ideas and innovations presented, but also as an inspiration for future collaborations and advancements in the pursuit of sustainable knowledge and innovation.

Assoc. Prof. Dr. Azlyn Ahmad Zawawi  
Editor-in-Chief, i-SPIKE 2025 Proceedings

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**CATEGORY 2**  
**SS (ACADEMIC)**

## ECONOSPHERE 1.0 – THE ECONOMICS E-FLASHCARDS

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### ABSTRACT

Economics is often perceived as a difficult subject due to its abstract concepts and complex terminology, which many students struggle to understand. Traditional teaching methods and physical flashcards, while useful, often fail to provide the level of engagement, flexibility, and interactivity that today's learners require. EconoSphere 1.0 introduces an online economics flashcards platform designed to address these challenges by integrating technology into learning. The platform contains 90 key economics terms, each presented on a digital card with explanations revealed upon flipping, alongside randomized questions to encourage critical thinking and application. Unlike physical flashcards, the online version supports self-paced learning, provides immediate feedback, and tracks progress, making it a more effective and sustainable alternative. By leveraging digital tools, the platform fosters active learning, promotes learner autonomy, and enhances long-term retention of economic concepts. The innovation lies in its ability to replace traditional flashcards while adding interactivity, accessibility, and eco-friendliness. This application demonstrates how technology-enhanced learning tools can improve student comprehension in economics, a subject crucial for informed decision-making and civic participation. Ultimately, the online flashcards platform highlights the transformative potential of digital innovation in education and contributes to bridging the gap between abstract theory and student understanding.

**Keywords:** Economics education, digital flashcards, active learning, self-paced learning, educational technology

### INTRODUCTION

Learning economics has long been a challenge for students due to its reliance on abstract theories, technical models, and conceptual terminology that often appear disconnected from real-world applications. Many learners find it difficult to memorize and apply economic terms, which hinders their ability to analyze problems and engage in critical economic thinking (Becker, 2017). In the digital era, however, education has been reshaped by technology, enabling tools that foster interactive, personalized, and flexible learning. Research highlights that digital innovations not only improve student engagement but also enhance retention and comprehension through active learning strategies (Bond et al., 2020; Crompton & Burke, 2020). Against this backdrop, EconoSphere 1.0 introduces the Economics E-Flashcards as an innovative approach to support student learning by combining digital accessibility with proven active recall strategies.

## OBJECTIVES

1. Enable students to accurately define and distinguish 90 core economics terms that underpin introductory micro- and macroeconomics.
2. Promote frequent, effortful recall using randomized prompts and repeat exposure over time, supporting robust long-term retention.
3. Provide an online experience that accommodates varied schedules and study habits, lowering friction to daily practice.
4. Offers all the benefits of paper flashcards, such as brevity, portability, and focus, without the logistical drawbacks of printing, shuffling, carrying, or losing decks.
5. Make it easy for instructors to recommend or integrate the deck into weekly learning routines, tutorials, or formative checks.

## DESCRIPTION OF THE PRODUCT

### *Product Features*

The Economics E-Flashcards consist of a comprehensive set of 90 key economic terms. Each flashcard presents a concise definition, which can be revealed by flipping the card, mimicking the interactive nature of traditional flashcards. To strengthen conceptual understanding, the platform also includes randomized practice questions linked to the terms, allowing students to apply their knowledge and test recall in diverse contexts. The digital format provides features such as instant feedback, mobile accessibility, and self-paced learning, ensuring that students can study anytime and anywhere. Teachers may also integrate the flashcards into classroom activities, making them a versatile resource for both guided and independent learning. Key features of the E-Flashcards include: (1) interactive card flipping to simulate traditional flashcards, (2) randomized practice quizzes for reinforcement, (3) immediate feedback for self-assessment, and (4) mobile accessibility for learning on the go. These features are designed to make the study process simple, effective, and adaptive to the learner's pace.

### *Functionality*

Functionality is a central element of the Economics E-Flashcards. The system is built for ease of navigation, with intuitive controls that replicate the experience of physical flashcards while enhancing it through digital interactivity. Students can shuffle terms, attempt quizzes, and track progress without requiring additional resources or printed materials. The platform is compatible across devices, ensuring smooth functionality for both web and mobile users.

### *Usefulness*

The E-Flashcards are designed to be practical, user-friendly, and suitable for learners of different levels. Their digital accessibility ensures that students no longer need to rely on printed flashcards, thus making the tool more environmentally sustainable and cost-effective. Beyond memorization, the flashcards help students retain knowledge more effectively through repetition and active recall strategies, both of which are proven to enhance long-term retention (Cepeda et al., 2006).

### Practicality

- **Replaces Physical Decks:** No printing, binding, or re-ordering cards; instant updates; no risk of lost cards. Digital decks also afford randomized order and easy duplication for targeted sets that are cumbersome with paper (UNESCO, 2023).
- **Low Setup Cost:** Single URL access; no app store or device lock-in; suitable for “bring-your-own-device” environments.
- **Scalable & Maintainable:** Terms and explanations can be refined based on instructor feedback or analytics without reissuing materials.

### Novelty

The novelty of the Economics E-Flashcards lies in the shift from physical flashcards to a fully digital, interactive platform. While physical flashcards have been widely used as a learning aid, this innovation enhances the concept by integrating technology for greater engagement, interactivity, and sustainability. The inclusion of randomized practice questions further differentiates it from conventional flashcards, encouraging not just recall but also application and critical thinking skills that are vital in mastering economics.

## CONCLUSION

Economics E-Flashcards translates strong, contemporary learning science into a simple, online experience that directly targets the discipline’s biggest early barrier: precise conceptual language. By entering retrieval practice, immediate feedback, and self-paced study in the browser, the product preserves everything learners value about physical flashcards while surpassing them in scalability, maintenance, and accessibility. Positioned as a complement to lectures, readings, and problem sets, this tool provides a pragmatic, evidence-aligned path to sharper definitions, fewer misconceptions, and better long-term retention, exactly what students need before moving on to models, graphs, and applied analysis.

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