E-PROCEEDINGS

INTERNATIONAL TINKER INNOVATION & ENTREPRENEURSHIP CHALLENGE (i-TIEC 2025)

"Fostering a Culture of Innovation and Entrepreneurial Excellence"

23 January 2025
PTDI, UiTM Cawangan Johor
Kampus Pasir Gudang

ORGANIZED BY:

Electrical Engineering Studies, College of Engineering
Universiti Teknologi MARA (UiTM) Cawangan Johor
Kampus Pasir Gudang
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Editors

Aznilinda Zainuddin

Maisarah Noorezam

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PREFACE

It is with great pleasure that we present the e-proceedings of International Tinker Innovation & Entrepreneurship Challenge (i-TIEC 2025), which compiles the extended abstracts submitted to the International Tinker Innovation & Entrepreneurship Challenge (i-TIEC 2025), held on 23 January 2025 at **PTDI, Universiti Teknologi MARA (UiTM) Cawangan Johor, Kampus Pasir Gudang.** This publication serves as a valuable resource, showcasing the intellectual contributions on the invention and innovation among students, academics, researchers, and professionals.

The International Tinker Innovation & Entrepreneurship Challenge (i-TIEC 2025), organized under the theme "Fostering a Culture of Innovation and Entrepreneurial Excellence," is designed to inspire participants at various academic levels, from secondary students to higher education students and professionals. The competition emphasizes both innovation and entrepreneurship, encouraging the development of product prototypes that address real-world problems and have clear commercialization potential. By focusing on technological and social innovations, i-TIEC 2025 highlights the importance of turning creative ideas into viable, market-ready solutions that can benefit users and society. The extended abstracts in this e-proceedings book showcase the diverse perspectives and depth of research presented during the event, reflecting the strong entrepreneurial element at its core.

We extend our sincere gratitude to the contributors for their dedication in sharing their innovation and the organizing committee for their hard work in ensuring the success of the event and this publication. We also appreciate the support of our collaborators; Mass Rapid Transit Corporation Sdn. Bhd. (MRT Corp), Universitas Labuhanbatu, Indonesia (ULB), Universitas Riau Kepulauan, Indonesia (UNRIKA) and IEEE Young Professionals Malaysia, whose contributions have been instrumental in making this event and publication possible.

We hope that this e-proceedings book will serve as a valuable reference for researchers, educators, and practitioners, inspiring further studies and collaborations in both innovation and entrepreneurship. May the knowledge shared here continue to spark new ideas and market-ready solutions, advancing our collective expertise and fostering the growth of entrepreneurial ventures.

A-SS004 - A-SS121

A-SS101: INNOVATION IN STEM EDUCATION: INTEGRATING MATHEMATICS AND ENTREPRENEURSHIP

Nadzrinah Ahmad
Sekolah Menengah Kebangsaan Pitas II, Sabah, Malaysia,

Corresponding author: Nadzrinah Ahmad, iman.nazrina91@gmail.com

ABSTRACT

The integration of mathematics and entrepreneurship in STEM education offers a unique opportunity to enhance student engagement and equip them with essential skills for the 21st century. Traditional mathematics education often lacks real-world application, which can lead to reduced interest among students. By embedding entrepreneurial concepts into mathematics instruction, this study aims to create an interdisciplinary framework that fosters critical thinking, creativity, and practical problem-solving. This research employed a mixed-method approach, combining qualitative and quantitative data collection. A series of project-based learning modules were designed to integrate mathematical concepts. The results indicate a significant improvement in students' understanding and application of mathematical concepts. Students reported higher levels of engagement and confidence in solving practical problems. Teachers observed enhanced collaboration and creativity among students as they applied mathematics in entrepreneurial contexts. Quantitative analysis showed a 25% increase in test scores related to the application of mathematics in real-world scenarios. Integrating mathematics and entrepreneurship within STEM education proves to be an effective strategy for fostering interdisciplinary skills and real-world problem-solving abilities. This approach not only deepens mathematical understanding but also equips students with entrepreneurial mindsets essential for future careers.

Keywords: STEM, Mathematics, Integrating ,Innovations, entrepreneurial

1. Product Description

Return on Investment (ROI) is a financial metric used to evaluate the profitability of an investment. It measures the return or gain relative to the initial cost, helping businesses and investors determine how efficiently their resources are being utilized. This product is about using microsoft excel template to calculate the ROI.

To calculate ROI (Return on Investment), use the formula:

$$\text{ROI (\%)} = \frac{\text{Net Profit}}{\text{Cost of Investment}} \text{x} 100$$

Steps to Calculate ROI:

Determine Net Profit:

Net Profit = Total Revenue - Total Expenses

Total Revenue: Income generated from the investment.

Total Expenses: Costs incurred for the investment (e.g., purchase costs, operating costs).

Identify the Cost of Investment:
This is the initial amount spent to make the investment.

Plug the Values into the Formula:
Substitute the values of net profit and cost of investment into the formula.

Example Calculation:
- Investment Cost: RM10,000
- Total Revenue: RM15,000
- Net Profit: RM15,000 - RM10,000 = RM5,000

Key Considerations:
- Positive ROI: Indicates a profitable investment.
- Negative ROI: Indicates a loss.

2. Table ROI

Table 1. ROI calculation using excel template

Description	Amount
Investment Cost (RM)	10000
Total Revenue (RM)	15000
Net Profit (RM)	5000
ROI (%)	50

The table presents a Return on Investment (ROI) calculation for a given financial scenario.

It includes the following key data points:
Investment Cost (RM 10,000): The initial amount invested in a project or business activity.
Total Revenue (RM 15,000): The total earnings generated from the investment.
Net Profit (RM 5,000): The profit obtained after subtracting the investment cost from total revenue.
ROI (50%): The percentage return on the investment, calculated using the formula:

Substituting the values:
The table is part of an ROI calculation using an Excel template, as referenced in **Figure 1**. This analysis helps in evaluating the effectiveness of the investment by comparing the profit gained relative to the cost incurred.

3. Novelty and uniqueness

Combining mathematics and entrepreneurship in STEM education is an innovative approach that offers a unique opportunity for students to develop a diverse set of skills. By integrating these two disciplines, students can learn not only the foundational principles of mathematics but also the practical application of these concepts in real-world scenarios through

entrepreneurial activities. This approach provides a holistic learning experience that encourages creativity, critical thinking, problem-solving, and collaboration. Students can explore mathematical concepts in the context of business decision-making, financial planning, data analysis, and market research, among others. By engaging in hands-on projects and simulations, students can gain a deeper understanding of how mathematics is used in entrepreneurship and develop an entrepreneurial mindset.

Furthermore, integrating mathematics and entrepreneurship in STEM education can help students see the connections between different subject areas and understand how they can be applied together to solve complex problems. Overall, the integration of mathematics and entrepreneurship in STEM education represents a novel and unique approach that can enhance students' learning experiences, foster their skills development, and prepare them for the challenges and opportunities of the 21st century.

4. Benefit to mankind

Integrating mathematics and entrepreneurship in STEM education can provide several benefits to mankind.

Practical application: By combining mathematics with entrepreneurship, students can learn how to apply mathematical concepts in real-world scenarios. This practical approach can enhance their problem-solving skills and prepare them for future careers in various fields.

Critical thinking: Entrepreneurship involves identifying opportunities, analyzing risks, and making strategic decisions. By integrating entrepreneurship into STEM education, students can develop critical thinking skills that are essential for success in the modern economy.

Innovation: The intersection of mathematics and entrepreneurship can spark creativity and innovation. Students can learn how to use mathematical concepts to develop new products, services, or business ideas that can benefit society and drive economic growth.

Career opportunities: By equipping students with both mathematical and entrepreneurial skills, they are better prepared to pursue careers in a wide range of industries, from technology and finance to healthcare and social enterprises. This can lead to greater job opportunities and economic empowerment for individuals and communities.

5. Innovation and Entrepreneurial Impact

This project promotes innovation and fosters a culture of entrepreneurship in several significant ways.

a) Developing Entrepreneurial Skills in Students

The project empowers students with critical entrepreneurial skills such as:

- Creative Thinking: Encouraging students to develop innovative solutions to practical problems.
- Financial Literacy: Teaching concepts like profit forecasting, budgeting, and cost analysis using mathematical models.
- Problem-Solving: Applying mathematical techniques to make informed decisions in entrepreneurial scenarios.

b) Community Engagement and Impact

For instance, students may work with local entrepreneurs to optimize operations using mathematical insights, creating mutual benefits and practical learning experiences.

c) Institutional Benefits

Within educational institutions, this project creates a shift toward experiential learning. Teachers and students collaborate on innovative projects, enhancing the institution's reputation as a hub for STEM and entrepreneurial development.

d) Industrial Relevance

Companies benefit from individuals who can analyze data, identify opportunities, and implement solutions effectively.

6. Potential commercialization

ROI (Return on Investment) is not just a financial metric for analysis but also a critical tool for commercialization strategies in various sectors. It plays a key role in measuring and justifying the viability of commercial initiatives. Here's how ROI can be commercialized or leveraged. Decision-Making in Business Ventures ROI helps businesses decide which projects to pursue based on profitability. The application are Compare ROI across different products or services and Focus on high-ROI projects to optimize resource allocation. Therefore, Marketing ROI helps businesses allocate budgets effectively to marketing campaigns that yield the highest returns. Investor Pitching and Fundraising Companies showcase their ROI on previous or ongoing projects to attract investors. High ROI serves as proof of strong business performance and Demonstrates effective use of capital and operational efficiency.

7. Acknowledgment

I would like to express my deepest gratitude to school principal for their invaluable guidance, support, and encouragement throughout the course of this research. Their expertise and insights were instrumental in shaping this work. I am also grateful to my friend for providing the necessary resources and a conducive environment to carry out this study. Special thanks go to my colleagues and peers for their constructive feedback and unwavering support, which inspired me to persevere during challenging times. Lastly, I extend my heartfelt thanks to my family and friends for their love, patience, and understanding, which have been my greatest source of strength.

8. Authors' Biography

Nadzrinah Ahmad is an experienced educator with 8 years of teaching Mathematics and Additional Mathematics at SMK Pitas II. She holds a Master degree in Mathematics Education from UPSI. Nadzrinah has demonstrated her innovative skills by winning the ANINOS competition and receiving the Gold accolade for her outstanding contributions to education. Her dedication to enhancing mathematics education reflects her passion for inspiring and empowering students through innovative teaching methods.