



# Preliminary Study in Developing a Neuroscience-Based Entrepreneurship Module To Enhance Financial Literacy Of Elementary School Students

Eli Elliyani<sup>1</sup>, Arita Marini<sup>2</sup>, M.Jafar<sup>3</sup>

eli.elliyani@unj.mhs.ac.id, [aritamarini@unj.ac.id](mailto:aritamarini@unj.ac.id), mjapar@unj.ac.id

Universitas Negeri Jakarta<sup>1, 2, 3</sup>

## Abstract

*This preliminary study aims to identify the urgency, rationale, and research focus for developing a neuroscience-based entrepreneurship module designed to enhance the financial literacy of elementary school students. In the context of the Sustainable Development Goals (SDGs), particularly Goals 1, 4, and 8, financial literacy is recognized as an essential 21st-century skill. However, various reports, including those from OECD (2024) and OJK (2019), reveal that Indonesia's financial literacy levels remain relatively low, especially among primary school students. Using a Research and Development (R&D) approach within the ADDIE framework, this study explores the needs and conceptual foundations for developing a neuroscience-based entrepreneurship learning module. The module is designed to integrate financial knowledge with entrepreneurial attitudes through principles of brain-based learning such as emotional stimulation, multisensory integration, and meaningful repetition. The expected outcome is a valid, practical, and effective instructional module that supports financial understanding and entrepreneurial character formation among young learners.*

**Keywords:** *neuroscience-based learning, entrepreneurship education, financial literacy, elementary school, R&D, module development*

## Introduction

The 21st century has brought rapid social and economic transformation, requiring educational systems to prepare students with adaptive and future-oriented competencies. Among the Sustainable Development Goals (SDGs), financial literacy contributes significantly to eradicating poverty (SDG 1), ensuring quality education (SDG 4), and promoting decent work and economic growth (SDG 8). Financial literacy equips individuals with the capacity to manage resources, make informed decisions, and achieve sustainable well-being.

Nevertheless, reports from the OECD (2024) and Indonesia's Financial Services Authority (OJK, 2019) indicate that the financial literacy level of Indonesian students remains low, with limited understanding of basic concepts such as saving, budgeting, and distinguishing between needs and wants. Learning at the primary level often introduces financial topics only superficially, without deep conceptual engagement. This situation highlights the need for innovative educational interventions that are both developmentally appropriate and contextually relevant.

In response, entrepreneurship education offers a promising avenue for improving financial literacy through experiential learning. By embedding financial principles in entrepreneurial contexts, students not only acquire financial knowledge but also cultivate creativity, responsibility, and decision-making skills. To enhance the effectiveness of such learning, integrating *neuroscience principles* is essential. Neuroscience reveals how the brain learns best through multisensory engagement, emotional connection, and active experience, making it a powerful foundation for designing educational interventions at the elementary level.

## Literature Review

Several studies underscore the importance of strengthening financial literacy in basic education (Mukhlis et al., 2025; Hermansyah et al., 2024; Prabowo, 2023). Yet, these studies also reveal that implementation often remains fragmented and lacks a systematic model aligned with brain-based learning.

The theoretical foundation of this study draws from:

1. Constructivism (Piaget, 1972; Vygotsky, 1978): Learning as an active process of constructing meaning through experience.
2. Social Learning Theory (Bandura, 2018): Learning through observation and modeling.
3. Humanistic Approach (Maslow, 2013; Rogers, 2021): Learning in emotionally supportive and meaningful contexts.
4. Neuroscience of Learning (Tokuhama-Espinosa, 2020; Medina, 2021): Emphasizing principles such as dual coding, spaced repetition, and emotional engagement to optimize brain function during learning.

These theories collectively underpin the proposed model of neuroscience-based entrepreneurship learning, designed to stimulate students' prefrontal cortex development, crucial for decision-making, planning, and self-regulation.

## Method

This study adopts a *Research and Development (R&D)* approach using the ADDIE model (Analyze, Design, Develop, Implement, Evaluate). The present paper reports on the analysis stage, including literature review, field observation, and need assessment conducted in two elementary schools in East Jakarta: SDN Pulo Gadung 01 Pagi and Sekolah Islam Tugasku.

Data were collected through observation, teacher interviews, and student responses to identify gaps between current financial literacy learning and the ideal learning conditions expected by the curriculum.

## Findings and Discussion

### Findings

The preliminary findings from the analysis and field observation stages reveal that financial literacy education at the elementary level in Jakarta remains limited in both content and pedagogical approach. Most schools introduce financial concepts such as saving, buying, and needs versus wants only superficially within other subjects (e.g., Social Studies or Mathematics). Teachers report a lack of structured teaching materials and practical guidelines for implementing financial education systematically.

Interviews with teachers and students from SDN Pulo Gadung 01 Pagi and Sekolah Islam Tugasku show that students demonstrate enthusiasm toward experiential and story-based learning activities. However, the learning process still relies heavily on verbal instruction and lacks multisensory stimulation. Students often memorize financial terms without understanding their application in daily life. Teachers also face challenges in connecting financial learning with real-life experiences and entrepreneurial values such as responsibility, honesty, and problem-solving.

Needs analysis results identify three core gaps:

1. Conceptual gap: limited understanding of basic financial principles (budgeting, saving, spending wisely).
2. Pedagogical gap: absence of contextual and neuroscience-aligned learning models that activate students' brain functions optimally.
3. Character gap: insufficient emphasis on building entrepreneurial attitudes (creativity, independence, perseverance).

These findings support the need for developing a neuroscience-based entrepreneurship module that not only teaches financial knowledge but also strengthens emotional engagement and hands-on experience to foster long-term behavioral change.

### Discussion

The findings confirm that integrating neuroscience principles into entrepreneurship education has the potential to enhance students' financial literacy more effectively than conventional approaches. Neuroscience-based learning emphasizes how the brain learns

best through emotional engagement, repetition, and multisensory experiences, which aligns with how children at the elementary stage process and retain information (Tokuhamma-Espinosa, 2020; Medina, 2021).

This study supports Bandura's (2018) *Social Learning Theory*, which highlights learning through observation and modeling, and Piaget's (1972) *Constructivism*, which views knowledge as built through active experiences. When students participate in activities such as simulated trading, storytelling about entrepreneurship, or managing small classroom markets, they are not merely learning financial terms — they are constructing cognitive and emotional associations with money management.

From a neuroscience perspective, engaging multiple sensory channels—visual, auditory, and kinesthetic—stimulates different brain regions, reinforcing memory consolidation and cognitive flexibility. Moreover, positive emotions experienced during play-based entrepreneurship tasks stimulate the release of dopamine, which enhances motivation and focus. These neurological mechanisms explain why emotionally rich and interactive learning environments result in deeper understanding and more enduring behavioral outcomes.

The integration of John Medina's 12 Brain Rules into the module design strengthens this alignment. For instance, the rules on “Exercise boosts brain power,” “We don't pay attention to boring things,” and “Repeat to remember” are reflected in the use of movement-based games, emotional storytelling, and spaced repetition strategies embedded in the module.

The findings also align with global and national educational agendas. According to OECD (2024) and OJK (2019), improving financial literacy from early education stages supports SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). By developing a neuroscience-based entrepreneurship module, this research contributes to both academic innovation and practical policy direction for financial education in Indonesia.

## Implications

The implications of this preliminary study are threefold:

1. For teachers, it offers a framework for applying brain-based principles to make financial literacy lessons more engaging and meaningful.  
For curriculum developers, it provides an evidence-based model for integrating entrepreneurship and neuroscience into early education.
2. For policymakers, it emphasizes the importance of designing inclusive, brain-friendly learning resources to foster financially literate and entrepreneurial citizens from a young age.

Overall, the findings affirm that the neuroscience-based entrepreneurship model has strong theoretical and empirical potential to improve financial literacy while nurturing entrepreneurial character among elementary students.

## Conclusion

This study provides a conceptual and empirical foundation for developing a neuroscience-based entrepreneurship module aimed at enhancing financial literacy among elementary school students. The main advantage of this approach lies in its integration of neuroscience principles such as multisensory engagement, emotional stimulation, and meaningful repetition into entrepreneurship education. These principles ensure that learning aligns with how the brain processes, stores, and recalls information, thereby improving both financial understanding and entrepreneurial behavior. The module's design also addresses pedagogical needs by combining theoretical rigor with practical classroom application, making financial education more interactive, contextual, and enjoyable for young learners.

However, this research has several limitations. The current findings are based on the preliminary (analysis) stage of the R&D process and are limited to a small number of schools in Jakarta. Therefore, the conclusions should be interpreted as an initial framework rather than a fully validated model. Future stages—including design, development, and field testing are needed to assess the module's validity, practicality, and effectiveness across diverse educational contexts.

Despite these limitations, the study has significant potential applications. The proposed module can be adapted as a teaching resource in entrepreneurship and financial literacy programs at the elementary level, a professional development tool for teachers to apply brain-based learning strategies, and a policy reference for curriculum designers seeking to integrate neuroscience-informed entrepreneurship education into national curricula. Overall, this work contributes to advancing innovation in education by demonstrating how neuroscience can bridge the gap between cognitive development and practical financial competence, empowering students to become responsible, creative, and financially literate citizens.

## References

- Allo, M., Rahmawati, L., & Siregar, D. (2023). *Pentingnya implementasi pendidikan literasi keuangan di sekolah*. *Jurnal Pendidikan Ekonomi*, 12(2), 115–127.
- Bandura, A. (2018). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Djoko, S. (2024). *Integrasi literasi finansial dalam kurikulum nasional sekolah dasar di Indonesia*. *Jurnal Pendidikan Dasar*, 14(1), 45–60.
- Hermansyah, R., Prabowo, A., & Ningsih, Y. (2024). *Implementation of financial literacy in elementary school: Study in Indonesia*. *International Journal of Educational Research*, 9(1), 23–34.
- Kafabih, A. (2020). *Pengaruh model pembelajaran terhadap peningkatan literasi finansial siswa sekolah dasar*. *Jurnal Pendidikan Keuangan*, 5(2), 90–101.
- Maslow, A. H. (2013). *A theory of human motivation*. Floyd, VA: Wilder Publications.



- Medina, J. (2021). *Brain rules: 12 principles for surviving and thriving at work, home, and school*. Seattle, WA: Pear Press.
- Mukhlis, H., Pratiwi, D., & Kusnadi, A. (2025). *Financial literacy of elementary students: A preliminary study on early financial knowledge and attitudes in Jakarta and Bekasi*. *Journal of Early Childhood and Primary Education*, 4(1), 33–47.
- OECD. (2024). *Financial literacy and education in the 21st century*. Paris, France: OECD Publishing.
- OJK. (2019). *Survei nasional literasi dan inklusi keuangan*. Jakarta, Indonesia: Otoritas Jasa Keuangan.
- Piaget, J. (1972). *The psychology of the child*. New York, NY: Basic Books.
- Prabowo, R. (2023). *Manfaat pentingnya meningkatkan literasi finansial anak sekolah dasar dengan program social fair and festival literasi finansial di Kebun Teh Wonosari*. *Jurnal Literasi Ekonomi Anak*, 2(3), 55–70.
- Tokuhama-Espinosa, T. (2020). *Neuroscience of learning and development: Enhancing creativity, compassion, critical thinking, and peace in higher education*. New York, NY: Routledge.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wibowo, S. (2025). *Integrating financial literacy in elementary school curriculum: A comparative study of developed countries*. *Journal of Global Education Studies*, 7(2), 88–101.