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Board Game-Based Experiential Learning as a Sustainable Innovation for Media and Information Literacy

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Abstract

The rapid spread of misinformation within digital media ecosystems poses a significant challenge to sustainable development, democratic participation, and informed civic engagement, highlighting the critical role of Media and Information Literacy (MIL) in achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions). However, traditional MIL instruction often relies on didactic approaches that limit learner engagement and experiential depth. This study investigates the critical success factors of a board game-based experiential learning approach as a sustainable and innovative intervention for MIL education. An MIL workshop was conducted with 422 students using a board game designed around Kolb's Experiential Learning Theory (ELT), enabling structured cycles of experience, reflection, conceptualisation, and action. A convergent parallel mixed-methods design was employed, combining Exploratory Factor Analysis (EFA) and correlation analysis with qualitative reflections collected through open-ended questionnaires. Five key factors were identified: (F1) Experiential Skills Development, (F2) Affective Motivation, (F3) Social Learning, (F4) Game Engagement, and (F5) Active Participation. The findings demonstrate that experiential learning plays a central role, strongly influencing motivational, social, and engagement-related factors. The intervention strengthened cognitive and affective MIL competencies, indicating that continued experiential engagement may

further support the progression from awareness to active participation in addressing misinformation. This paper contributes a scalable, low-cost, and non-digital educational innovation, offering practical insights for educators and policymakers seeking to design inclusive, learner-centred MIL interventions that support long-term social resilience and sustainable development.

Keywords: Media and information literacy, Experiential learning, Non-digital game-based learning, Sustainable development goals, Active participation, Exploratory factor analysis

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Introduction

The rapid expansion of social media platforms and advances in Artificial Intelligence (AI) technologies have significantly accelerated the production, circulation, and amplification of misinformation and disinformation worldwide (Putra, 2024). These escalating information disorders represent a major global challenge, with far-reaching implications for sustainable development, democratic governance, and social resilience (Heryanto et al., 2024). Misinformation has been shown to distort public understanding of critical issues such as climate change, public health and vaccination, electoral processes, and international affairs (Zhang & Ghorbani, 2020), while also eroding trust in institutions, damaging reputations, and, in extreme cases, inciting violence by intensifying racial, religious, and ideological tensions (Azmi, 2022). Such impacts directly undermine the achievement of the United Nations Sustainable Development Goals (SDGs), particularly SDG 16, which emphasises peace, justice and strong institutions (United Nations, 2015).

In response, Media and Information Literacy (MIL) has emerged as a critical educational strategy for fostering informed, ethical, and responsible participation in digital societies (Nieminen, 2024). MIL equips individuals with the essential competencies needed to critically evaluate information, distinguish credible sources from false or misleading content, and engage ethically and responsibly in digital environments (Adjin-Tettey, 2022). Studies indicate that MIL-trained individuals are more capable of identifying misinformation and are less likely to disseminate false content, highlighting MIL's role in fostering informed citizenship and democratic resilience (Pinto da Mota Matos et al., 2016). As such, MIL serves as a key enabler of SDG 4 (Quality Education) by promoting inclusive, equitable, and lifelong learning competencies essential for navigating complex digital ecosystems (United Nations, 2015).

The effectiveness of MIL education is strongly influenced by pedagogical design. Traditional lecture-based methods often position learners as passive recipients of knowledge, limiting engagement and the development of critical MIL competencies (Cernicova-Buca & Ciurel, 2022; C. Chan, 2020). Although online learning environments can enhance interactivity, persistent digital divide issues, such as limited internet connectivity, inadequate access to digital devices, and infrastructural disparities continue to marginalise learners in rural and remote communities, making it difficult for teachers to maintain meaningful interaction and instructional continuity (Kem, 2024). These inequities challenge the inclusiveness and equity principles central to SDG 4 (Loganathan et al., 2021).

As digital culture evolves, MIL has shifted toward more creative, participatory, and socially situated learning models that emphasise active student engagement, peer collaboration, and shared knowledge construction rather than being passive consumers (Buckingham, 2015; Jenkins, 2006).

Experiential and game-based learning approaches align closely with this paradigm by offering interactive and reflective learning experiences that foster critical thinking, active learning, and real-world application (Buckingham, 2019; Pomichal & Trnka, 2022). While digital game-based learning (DGBL) shows promise, it often limits face-to-face social interaction, accessibility barriers, and varying levels of infrastructure and readiness among teachers and schools (Kaimara et al., 2021; B. S. Tan et al., 2021). In contrast, non-digital game-based learning (NDGBL), particularly through board game-based approaches, provides an inclusive, socially interactive, and cost-effective alternative. Board games are said to be able to support collaborative learning and peer interaction without reliance on digital infrastructure (Ong, 2022).

Therefore, this study sought to investigate board game-based experiential learning as an innovative approach to MIL education for Malaysian school students, grounded in Kolb's Experiential Learning Theory (ELT). The research focused on identifying the critical success factors in designing and implementing board games for sustainable, inclusive and engaging MIL education with the aim of empowering students to become critical media users and responsible digital citizens who contribute to democratic participation, social cohesion, and long-term social resilience.

The objective of this study is to develop an integrated pedagogical framework that combines Kolb's ELT with MIL competencies for sustainable education. From this objective, the study addresses the following research questions:

1. RQ1: What are the critical factors in designing and implementing board game-based experiential learning for sustainable MIL education?
2. RQ2: How can the findings inform inclusive, equitable, and sustainable MIL education practices that support SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions)?

Literature Review

MIL and Sustainability Competencies

Media and Information Literacy (MIL) has been widely recognised as a foundational competence for navigating contemporary information ecosystems characterised by misinformation, algorithmic systems, and artificial intelligence. UNESCO defines MIL as a set of competencies that enable individual to access, evaluate, use, create, and reflect on information and media content in ethical and effective ways (UNESCO, 2021; Wilson et al., 2011). These competencies are increasingly essential in addressing the global spread of misinformation and disinformation which undermine informed decision-making, civic participation, and public trust (Reineck & Lublinski, 2015).

MIL is also evolving in response to the digital age from a critical stance to one rooted in participatory culture, where students are encouraged not only to consume but also to create, share, and reflect on media content. In this context, learning becomes more meaningful when students are active contributors, engaging in co-construction of knowledge and civic dialogue (Jenkins, 2006; Jenkins et al., 2006). Embedding these participatory values into MIL pedagogy bridges the gap between awareness and action, empowering students to not only analyse information but to respond ethically and responsibly.

From a sustainable development perspective, MIL contributes directly to social resilience, democratic stability, and inclusive education, aligning closely with the objectives of SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions) (United Nations, 2015). Empirical studies indicate that individuals with MIL training are more capable of identifying false or misleading content and less likely to disseminate misinformation, thereby supporting informed citizenship and responsible participation in democratic processes (Adjin-Tettey, 2022). As such, MIL is increasingly positioned not only as a media skill set, but as a critical component of education for sustainable and democratic societies (UNESCO, 2015).

UNESCO further emphasises that MIL plays a key role in empowering citizens to exercise fundamental rights related to freedom of expression and access to information, while also fostering ethical responsibility in media use and content creation (UNESCO, 2015). Core MIL competencies include the ability to critically evaluate information, understand the roles and responsibilities of MIL providers in democratic societies, and engage with media for lifelong learning, civic participation, and good governance. When integrated with cultural and social competencies, MIL also supports intercultural dialogue, social cohesion, and a culture of peace, reinforcing its relevance to SDG 16 and long-term societal sustainability (UNESCO, 2015).

Experiential Learning Theory

This study is grounded in Kolb's ELT, which conceptualises learning as a cyclical process involving four stages: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualisation (AC), and Active Experimentation (AE) (Kolb, 1984). ELT emphasises learning through experience and reflection, making it a widely adopted framework in educational game design and applied learning contexts (Stock & Kolb, 2021). By engaging learners in active experimentation and reflection process, ELT promotes supports deeper understanding and development of higher-order cognitive skills, including critical thinking, problem-solving and ethical decision-making, which are central to MIL education (Buckingham, 2019).

Empirical studies demonstrated the effectiveness of experiential learning in enhancing critical thinking and self-directed learning across disciplines including higher education, cultural heritage, and media-related fields (Dimmitt, 2017; Moon, 2013; Sun & Hashim, 2025). It was found that reflection is a key mechanism through which learners integrate theoretical knowledge with practical experience, leading to more meaningful learning outcomes (Moon, 2013).

Critiques of experiential learning suggest that ELT, when applied in isolation, may insufficiently address social interaction and limit broader learner engagement (Quay, 2003). However, MIL learning is inherently social and contextual, requiring dialogue, collaboration, and ethical reasoning beyond individual cognition (Livingstone, 2004). Integrating interactive and collaborative elements within experiential learning environments can therefore strengthen ELT's capacity to support MIL competencies by enabling learners to critically evaluate information (Adam & Perumal, 2020; Mai et al., 2024), engage in collective sense-making, and apply ethical judgment in real-world media contexts (Buckingham, 2019).

Dieleman and Huisingsh (2006) highlight that games provide structured environments where learners can experiment, reflect, and engage in dialogue, fostering systems thinking, ethical reasoning, and collaborative problem-solving. These potential benefits make games highly relevant to experiential learning for sustainability. While Dieleman and Huisingsh's 2006 study focused on digital games, these principles may apply to non-digital board games, which facilitate face-to-face ethical deliberation enable learners to internalise MIL competencies through experiential and reflective processes, enhancing critical thinking, ethical awareness, and sustainability-oriented skills.

Non-digital Game-based Learning (NDGBL) as Experiential Implementation of MIL

Building on the experiential learning principles outlined above, NDGBL has gained increasing attention as a potentially effective pedagogical approach for implementing experiential learning in MIL education, particularly in a resource-constrained context (Naik, 2014). In contrast to DGBL, NDGBL offers a socially rich learning environment that supports face-to-face interaction, emotional engagement, role negotiation, and collaborative problem-solving, making it particularly suitable for MIL education (Kaimara et al., 2021; Suprpto & Hartanti, 2019).

Board game-based NDGBL promotes active participation, peer learning, and strategic decision-making while reducing technological demands and accessibility barriers often associated with DGBL (Cortés et al., 2024). Unlike digital approaches that may limited social interaction and high technical demands, NDGBL fosters active group participation, role negotiation, and peer learning, making it an

effective tool for delivering complex concepts such as MIL in accessible, engaging ways (Naik, 2014; Ong, 2022). By enabling learners to experiment with decisions, reflect on outcomes, and adjust strategies in a structured setting, board games align closely with Kolb's experiential learning cycle and support the internalisation of MIL competencies through interactive and reflective processes (Sato & De Haan, 2016).

More importantly, NDGBL also addresses persistent digital divide challenges, including limited internet connectivity, inadequate access to digital devices, and infrastructural disparities which continue to marginalise learners in rural and under-resourced contexts (Kem, 2024; Loganathan et al., 2021). As a cost-effective and accessible alternative, NDGBL supports the equity and inclusiveness principles of SDG 4 (Quality Education) by enabling meaningful participation regardless of digital access.

The integration of interactive gameplay and collaborative scenarios enhances learners' capacity to reflect on misinformation, practice ethical decision-making, and engage in collective sense-making. Empirical studies indicate that experiential game-based approaches enhance learner motivation, engagement, and knowledge retention, particularly when students are allowed to test ideas safely before applying them to real-world scenarios (Booker & Mitchell, 2021; Sun & Hashim, 2025). These outcomes contribute to democratic participation, social cohesion, and resilience to disinformation, aligning MIL education with SDG 16 (Peace, Justice, and Strong Institutions).

Research Gap and Study Contribution

Despite growing interest in experiential and game-based approaches for MIL education, existing studies have primarily focused on DGBL or short-term interventions, with limited attention to non-digital board game-based implementations in resource-constrained educational contexts (Cernicova-Buca & Ciurel, 2022; Naik, 2014). Aside from that, there is a lack of studies that have systematically examined the critical success factors that underpin effective board game-based experiential learning for MIL particularly from a sustainability and equity perspective (Dieleman & Huisingsh, 2006). There remains a lack of empirical evidence linking experiential learning design, non-digital game-based pedagogy, and MIL competencies within a coherent framework aligned with SDG 4 (Quality Education) and SDG 16 (Peace, Justice, and Strong Institutions) (Cortés et al., 2024). To address this gap, this study focused on investigating the critical factors of a non-digital board game-based experiential learning for MIL education amongst Malaysian students using a mixed-methods research approach.

Methodology

Designing the Non-digital MIL Board Game Experiential Learning Framework

This study proposed an MIL learning design framework that integrates Kolb's Experiential Learning Cycle (Kolb, 1984). The intervention was structured around a three to four hours workshop which comprised three structured gameplay rounds aligned with the four ELT stages: CE, RO, AC and AE, thus creating a dynamic learning environment that integrates affective engagement, peer interaction, and core game-based elements such as collaboration, role-play, and strategic decision-making. The gameplay rounds are as follows:

- **Round 1: Concrete Experience**—Participants engage in guided gameplay exploring media roles and ethical dilemmas within a simulated media ecosystem, where hidden agenda mechanics require them to make real-time decisions such as balancing information sharing versus verification under competing goals (e.g., gaining followers versus ensuring accuracy), thereby fostering emotional and social interaction.
- **Round 2: Reflective Observation & Abstract Conceptualisation**—Facilitated discussions by coach with peers help participants analyse decisions, identify bias, and relate gameplay to real-world MIL issues, reinforcing key competencies.
- **Round 3: Active Experimentation**—Participants apply their insights by co-creating MIL content or simulating responses to information disorder, solidifying learning through collaborative practice with creating project or game.

To operationalise this framework, this study utilised the *Follow Me* board game—an educational, non-digital serious game developed by ARUS Academy and designed specifically to address key MIL competencies. The game set includes cards, tokens, and a guidebook, mirrors real-world media dynamics using relatable demographics, media roles, and hidden agendas, supporting both gameplay and coach-led lesson planning (ME4A ARUS, 2024). Game elements such as strategic planning, secret agendas, and ethical choices support deep learning and reinforce participants' ability to apply MIL knowledge beyond the classroom. By aligning Kolb's ELT cycle with game mechanics and socio-emotional interaction, the framework fosters not only cognitive and skill development but also the emotional and ethical understanding vital for effective MIL education.

Sampling and Participants

A total of 422 Malaysian students aged 13 to 24 from secondary and tertiary institutions participated in this study. This age range was selected to capture learners at different educational stages, where variations in MIL competencies are expected. While the Department of Statistics Malaysia (DoSM) and the United Nations (2014) define youth as aged 15-24, prior studies highlight the importance of developing MIL skills among younger adolescents (below 15) as well (Costa et al., 2018; Pandian et al., 2020). The participants were selected based on minimal prior exposure to MIL board games. They

were recruited through eight *Follow Me* workshops that were conducted between October 2023 and March 2024. Ethical approval was obtained from the relevant institutional authority. Participation was voluntary, and all data were anonymised to ensure confidentiality.

Data Collection and Analysis

This study operationalised MIL competencies through experiential learning processes and participant responses, rather than assessing MIL as a single, standardised skill set. Consistent with UNESCO's MIL framework, competencies such as critical evaluation of information, ethical reasoning, reflection, awareness, participation, and systems thinking are examined through students' experiential engagement, affective responses, collaborative interaction, and behavioural intentions (UNESCO, 2013, 2019). This process-oriented approach reflects evidence that MIL development is best captured through learning experiences integrating cognitive, emotional, and social dimensions, particularly in experiential and game-based contexts (H. S. Tan et al., 2025). Data collection methods used in this study are as follows:

- A. ***Quantitative Data: Survey Questionnaire.*** A post-intervention survey was administered using a 5-point Likert scale, with 40 items adapted from existing studies on experiential, game-based, and interactive learning (C. K. Y. Chan, 2023; Dieleman & Huisinigh, 2006; Sato & De Haan, 2016). To ensure scale reliability, the instrument was validated by three domain experts and refined through Cronbach's Alpha, achieving high internal consistency ($\alpha = .968$) (Pallant, 2020).
- B. ***Qualitative Data: Reflective Feedback Form.*** Open-ended questions to encourage participants to reflect on their entire board game-based experiential learning journey. Questions prompt discussion on key takeaway, helpful and distracting factors of the experience, and the participants' willingness and confidence in actively participate in combating information disorder to support the quantitative finding (Dieleman & Huisinigh, 2006).

Accordingly, a convergent parallel mixed-methods design was used to integrate post-intervention surveys and reflective feedback, enabling a comprehensive evaluation of the intervention form both quantitative and qualitative perspective (Creswell & Creswell, 2023). This design allowed both datasets to be analysed independently and then merged to provide complementary insights, where qualitative findings were used to triangulate and enrich the interpretation of the five quantitative factors derived from the Exploratory Factor Analysis (EFA).

Qualitative data from open-ended responses were analysed using reflexive thematic analysis following Braun and Clarke's fix-phase framework to identify recurring patterns and experiential

meanings related to participants' learning experiences (Braun et al., 2019). The resulting themes were then systematically mapped onto the EFA-derived factors to examine areas of convergence, extension, and divergence, thereby strengthening the overall validity and interpretation depth of NDGBL in MIL education.

The thematic analysis revealed five overarching themes clusters: *(Theme 1) experiential learning takeaways, (Theme 2) perceived learning enablers, (Theme 3) perceived constraints and distractions during gameplay, and (Theme 4) social and affective learning experiences, and (Theme 5) perceived willingness and confidence in addressing information disorder.* These thematic clusters were not treated as standalone descriptive categories but were explicitly used to triangulate the quantitative factor structure. The integrated findings are further elaborated in the subsequent factor-based results section.

Results Analysis and Discussion

An Exploratory Factor Analysis (EFA) using Principal Axis Factoring (PAF) confirmed the dataset's suitability with a KMO value of 0.962 and a significant Bartlett's Test ($p < .001$) (Pallant, 2020). After removing items with loadings below 0.5, 29 items were grouped into five factors, accounting for 63.64% of total variance. Bivariate correlation analysis further explored inter-factor relationships. Factor labels were named based on item content and supported by participant feedback.

Factor 1: Experiential Skills Development

As the most dominant factor (45.49% of variance), bridging the gap between game mechanics and cognitive development. Factor 1: Experiential Skills Development showed strong correlations with all other factors ($r = 0.574-0.725$, $p < .01$), highlighting its central role. Aligned with Kolb's ELT, it supports MIL awareness, reflection, critical thinking, and real-life application (Stock & Kolb, 2021). Participants reported that gameplay helped them connect MIL concepts to real-life cases ($M = 3.90$), self-reflection on media use ($M = 3.71$).

This quantitative pattern is further reinforced by *Theme 1 (experiential learning takeaways)*, where participants similarly emphasised learning through real-world application, reflective thinking, and cognitive engagement during gameplay. Feedback included: *"It helped me link the concept of MIL with real information issues"* and *"It made me rethink how I use media."*

Reflection was reinforced through feedback and strategy refinement ($M = 3.69-3.67$) supporting Kolb's RO phase. Deeper cognitive engagement emerged in moral decision-making ($M =$

3.65), aligned with AC, as shown in comments like: “*Do they need my comment, or will it create more hate?*”

Finally, AE was evident as students applied MIL skills to real-life contexts (M = 3.75–3.77). One participant shared: “*I recognised media users type I didn’t know before and made better choices.*”

Overall, this factor indicates that experiential gameplay fosters emotional, ethical, and cognitive engagement essential for building critical MIL competencies.

Factor 2: Affective Motivation

This factor emphasised the importance of teacher guidance and emotional engagement in MIL learning, supporting what has been found in research (C. Chan, 2020). This factor is triangulated with *Theme 2 (perceived learning enablers)*, where participants similarly highlighted the role of facilitator support, emotional engagement, and structured guidance in enhancing learning motivation, thereby reinforcing the quantitative evidence for affective motivation.

Most participants agreed that face-to-face interaction made learning more enjoyable (M = 4.20), and the game helped them connect thoughts, emotions, and actions (M = 3.81), which participants commenting that “*I finally know how to control emotions when facing the media.*” These findings highlight the role of affective engagement and facilitator guidance in supporting reflective learning and meaning making, which are central to experiential learning processes.

Teacher guidance was found to be highly valued in this study, particularly in explaining rules, facilitating debriefs, and shaping strategy (M = 4.06–4.13). Comments such as “*The coach’s explanation help us focus.*” reflects the importance of structured facilitation in experiential learning environments, where guided reflection helps learners connect experience with conceptual theoretical understanding. While competition moderately enhanced motivation (M = 3.65), feedback showed mixed preferences, with many students valuing collaboration and conceptual learning over winning.

Factor 3: Social Learning

Factor 3: Social Learning emerged as a key component of the MIL board game experience, reinforcing the social collaborative and interactive dimensions of experiential learning embedded in non-digital game-based learning environments (Adam & Perumal, 2020). Quantitative data showed that collaboration, discussion, and peer engagement significantly contributed to learning (M = 3.85–4.03), demonstrating how peer interaction and discussion support deeper reflection and collective sense-making during experiential learning. This finding is further support by *Theme 4 (social and affective*

learning experiences), where participants similarly emphasised collaboration, peer interaction, and shared discussion as key learning mechanisms, thereby reinforcing the quantitative evidence for social learning.

The strong correlation between this factor and Factor 2: Affective Guidance and Motivation ($r = .751, p < .001$) underscores the synergy between facilitator support and peer collaboration, suggesting both are essential for meaningful learning.

Comments such as “*Collaboration helped us learn*” and “*Listening to others gave me new perspectives*” illustrate the value of guided interaction in deepening understanding and sustaining motivation in MIL learning.

Factor 4: Game Engagement

Game-based learning (GBL) draws from constructivist, cognitive, and behaviourist theories, promoting engagement, interactivity, and structured challenges (Plass et al., 2015). Factor 4: Game Engagement showed strong correlations with Factors 1 to 3 ($r > .60, p < .001$), indicating that enjoyment and engagement were closely linked to learning, motivation, and collaboration (Sun & Hashim, 2025).

Participants reported high levels of game enjoyment ($M = 4.01$), perceived learning ($M = 3.85$), and willingness to replay ($M = 3.83$). The role-playing and strategy elements were especially appreciated, with comments like, “*It needs to be played multiple times to fully understand,*” reflecting Kolb’s emphasis on iterative experience. For example, players encounter ethical dilemmas involving “sharing versus verifying” information, where the hidden agenda mechanic requires them to decide whether to prioritise gaining followers or verifying content accuracy. This creates immediate reflective observation on the potential consequences of spreading misinformation within the gameplay context.

Overall immersion was generally positive ($M = 3.77$), suggesting that gameplay effectively supported engagement and learning processes. However, engagement was not uniform across all participants, as some reported constraints that affected the game experiences, including unclear rules, time limitation, and occasional social discomfort. This finding is further triangulated by *Theme 3 (perceived constraints and distractions during gameplay)*, which similarly identified issues related to rule clarity, time management, coordination challenges, and competition elements. These findings suggest that engagement is shaped not only by motivational factors but also by structural and design-related constraints within gameplay.

Factor 5: Active Participation

This factor explores participants' attitudes toward combating information disorder. While awareness was high ($M = 4.11$), and importance recognised ($M = 3.89$), participants were undecided when it came to willingness to act ($M = 3.25$), indicating a gap between awareness and behavioural readiness. This pattern is further triangulated by qualitative result of *Theme 5 (perceived willingness and confidence in addressing information disorder)*, where participants reflected on their readiness and perceived barriers to action, thereby extending and contextualising the quantitative evidence for active participation. Qualitative feedback suggests this “hesitation gap” is rooted in social discomfort and a fear of online conflict rather than a lack of MIL awareness, consistent with moderate correlations across items ($r = .286-.483$). Though some expressed intent to engage, others cited barriers like low confidence or disinterest, suggesting that awareness alone is insufficient for action.

From a pedagogical perspective, these findings highlight the need for action-oriented learning strategies that build communicative confidence alongside technical verification skills, in order to translate awareness into agency. Approaches such as structured role-play, guided response scenarios, and supportive discussion environments may help reduce perceived barriers and strengthen students' confidence in responding to misinformation (Adjin-Tettey, 2022; Pinto da Mota Matos et al., 2016). These findings further suggest that while experiential learning can raise awareness, sustained opportunities for reflection, practice, and real-world application are necessary to translate MIL awareness into active participation (Buckingham, 2013; Jenkins, 2006).

Factor 5: Active Participation correlated moderately with the other factors ($r = .478-.574$), suggesting that while experiential learning, reflection, and collaboration contribute to raising MIL awareness, no single element guarantees active engagement. This supports Kolb's ELT, where hands-on experimentation must extend beyond the game to translate learning into action (Stock & Kolb, 2021).

Collectively, the five factors (*F1*) *Experiential Skills Development*, (*F2*) *Affective Motivation*, (*F3*) *Social Learning*, (*F4*) *Game Engagement*, and (*F5*) *Active Participation* highlight the central role of experiential learning in supporting MIL development through emotional engagement, reflection, collaboration, and ethical decision-making.

The findings demonstrate that non-digital board game-based learning environments provide a structured yet flexible platform for learners to experience, reflect, conceptualise, and apply MIL competencies. By aligning Kolb's ELT with inclusive and socially interactive game mechanics, the proposed framework offers a practical approach to fostering critical media engagement, democratic participation, and social resilience in support of SDG 4 and SDG 16. Additionally, the relationship

between the learning outcomes and the identified critical success factors is reflected through the design of the game-based activities. For instance, hands-on gameplay and real-world scenario tasks support *experiential learning and skill development*, as students actively apply decision-making and connect concepts to real-life context. Reflection and facilitator-led debriefing contribute to *affective guidance and motivation*, reinforcing understanding through feedback and emotional engagement. Furthermore, peer discussion and collaborative gameplay align *with interactive and collaborative learning*, fostering teamwork and social interaction. The use of engaging game mechanics enhances *game enjoyment and immersion*, which supports sustained participation. Finally, project-based application and role-play elements promote *awareness and active participation*, enabling students to transfer MIL competencies into real-world practices. (refer to Figure 1).

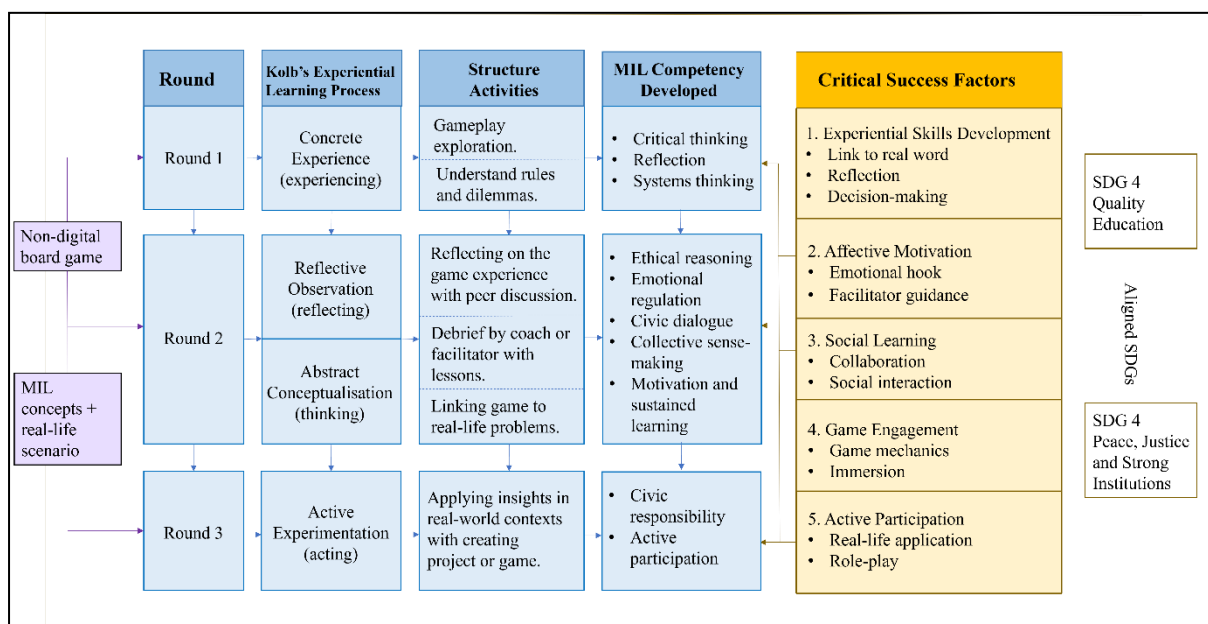


Figure 1. Non-digital MIL Board Game Experiential Learning Framework

Conclusion and Future Work

This study presents a novel non-digital, experiential learning framework for MIL education, grounded in Kolb's Experiential Learning Theory (ELT) and implemented through a board game-based approach. Using the *Follow Me* board game as a teaching tool, the study explored how structured, hands-on, and interactive gameplay effectively built MIL competencies among Malaysian students across secondary and tertiary levels students particularly in low-tech educational contexts (Kem, 2024; Loganathan et al., 2021).

In answering RQ1, five critical factors were identified as essential for effective board game-based MIL education: *Experiential Skills Development, Affective Motivation, Social Learning, Game*

Engagement, and Active Participation. The quantitative and qualitative results indicate that board game-based experiential learning supports critical thinking, ethical reasoning, self-reflection, and collaborative sense-making, reinforcing the value of experiential and game-based pedagogies for MIL education (Dieleman & Huisingsh, 2006; Kolb, 1984; Sato & De Haan, 2016; Stock & Kolb, 2021). These factors illustrate how NDGBL can operationalise ELT, enabling learners to internalise MIL competencies through structured experiential processes, reflection, and peer interaction (Cortés et al., 2024). The findings align with prior research on experiential and game-based learning for sustainability and ethical reasoning (Dieleman & Huisingsh, 2006), demonstrating that NDGBL can achieve similar outcomes to digital approaches while addressing accessibility and equity challenges.

In response to RQ2, the study shows that board game-based experiential learning promotes inclusive, equitable, and sustainable MIL practices. By combining cognitive, social, and affective learning, the approach supports SDG 4 by enabling quality, accessible, and participatory education, and SDG 16 by fostering responsible digital citizenship, ethical media engagement, and social resilience (UNESCO, 2015). While the intervention promoted cognitive and affective development, relatively weaker links between awareness and action suggest that students may need targeted confidence-building interventions to overcome social discomfort when intervening in digital misinformation cycles to transform understanding into behaviour. This echoes Jenkins' participatory culture, which highlights the importance of empowering, collaborative environments for sustained engagement (Buckingham, 2013; Jenkins, 2006).

However, the short duration of the intervention limited insights into long-term impact, and some participants faced confidence or cognitive barriers that may have affected engagement. Future research could consider exploring longitudinal interventions, adaptation of the framework across diverse contexts, examining the motivational effects of competition and collaboration, and develop educator toolkits to support broader implementation. Overall, this study provides empirical evidence that non-digital, board game-based experiential learning is a viable, sustainable, and socially inclusive approach to MIL education, bridging theory, practice, and the UN Sustainable Development Goals.

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