

## Gamified QR-Based Cultural Literacy to Enhance Learning Motivation of Indonesian Migrant Children in Malaysia

Suardi <sup>1)\*</sup>, Syarifah Aeni Rahman <sup>2)</sup>, Syaza Hazwani Bin Zaini <sup>3)</sup>, Aliem Bahri <sup>4)</sup>, Indah Ainun Mutiara <sup>5)</sup>, Andi Ardhila Wahyudi <sup>6)</sup>

<sup>1, 2, 4, 5, 6</sup> Universitas Muhammadiyah Makassar, Indonesia

<sup>3</sup>Universiti Pendidikan Sultan Idris, Malaysia

### Abstract

Children of Indonesian migrant workers enrolled at Sekolah Indonesia Kuala Lumpur (SIKL) face persistent challenges in sustaining learning motivation and preserving attachment to their national cultural identity within a constrained transnational learning environment. This study aims to enhance cultural literacy and learning motivation among Indonesian migrant children by implementing an interactive, game-based learning model integrating the Talking Stick and Mystery Box methods with culture-oriented digital media delivered through QR Codes. Employing a participatory and collaborative community-based approach, the program was conducted at the Sentul Guidance Studio in partnership with teachers and the studio head through four stages: problem identification, development of learning media, implementation, and evaluation. Data were collected using Likert-scale questionnaires, participatory observation, and semi-structured interviews, and analyzed descriptively. The findings indicate that 87% of students experienced increased learning motivation and 83% demonstrated improved understanding of Indonesian culture, as reflected in more active classroom participation, greater enthusiasm for cultural content, and stronger expression of cultural pride. These results suggest that the integrated gamified and QR-based model is effective in simultaneously strengthening cultural identity and promoting engagement in learning among Indonesian migrant children. The novelty of this research lies in combining educational game techniques with QR-mediated cultural resources specifically tailored to the context of Indonesian children abroad. This study contributes a replicable and scalable pedagogical model for migrant learning centers and Indonesian schools overseas, offering practical guidance for educators and policy-makers seeking to support the cultural continuity and educational participation of children in transnational settings.

**Keywords:** Indonesian migrant children; cultural literacy; learning motivation; gamified learning; QR code-based learning media

### Introduction

Improving the quality of education for migrant workers' children has become a major challenge in global education systems, particularly for countries with large diasporic communities such as Indonesia. Migrant children frequently encounter discontinuities in schooling, instability of learning environments, and limited support structures, which affect both academic achievement and the preservation of cultural identity (Hill & Whitty, 2021). In transnational settings where the language, norms, and symbolic references of the host country dominate everyday life, children's opportunities to engage meaningfully with their national culture are often fragmented and incidental rather than systematic. This situation is especially critical for Indonesian children abroad, whose exposure to local cultures can gradually displace their knowledge of, and emotional attachment to, Indonesian cultural heritage.

Several studies underscore that in such contexts, migrant children's weak understanding of national culture tends to correlate with declining learning motivation and reduced engagement in formal

education, particularly when curricula are perceived as distant from their lived experiences (Nguyen et al., 2024; Tan & Chee, 2021). Sekolah Indonesia Kuala Lumpur (SIKL), especially the Sentul Guidance Studio, represents one such context where these issues converge. Children of Indonesian migrant workers attending this learning center must negotiate between the demands of the host-country environment and their limited, often sporadic, access to Indonesian cultural content. Constraints in learning resources, the non-contextual nature of instructional materials, and socio-economic vulnerabilities of families contribute to difficulties in maintaining both cognitive and emotional connections with Indonesia's cultural roots.

Despite the presence of Indonesian curriculum-based institutions overseas, several fundamental problems persist. First, many learning practices remain highly teacher-centered, with minimal integration of interactive or culturally authentic learning experiences, resulting in low student participation and passive learning habits. Second, motivational challenges arise because learning activities are frequently perceived as routine, exam-oriented, and disconnected from students' daily realities as children of migrant workers. Third, the learning environment at studios such as Sentul often lacks systematically curated cultural content that could help students construct a coherent narrative of Indonesian identity amid transnational mobility. These conditions cumulatively hinder both the internalization of cultural values and the development of sustainable motivation to learn.

Common solutions proposed to address these problems include the enrichment of learning materials with cultural themes, the use of multimedia resources, and the implementation of generic student-centered pedagogies such as group discussions, project-based learning, and conventional educational games. While these approaches can increase participation to some extent, their effectiveness is limited when not explicitly designed to respond to the specific sociocultural realities of migrant children. Standard digital learning initiatives, for example, often focus on cognitive outcomes or generic skills without sufficiently considering how cultural narratives and symbols are integrated into the learning process. As a result, they tend to have only partial impact on strengthening cultural identity or sustaining motivation over time in transnational school communities.

Interactive game-based learning models have emerged as more targeted pedagogical strategies to bridge these gaps. The Talking Stick method, as one form of cooperative learning, has demonstrated effectiveness in enhancing student engagement, self-confidence, and active participation by creating structured yet playful opportunities for all learners to speak and interact (Ifrianti et al., 2020; Novianto et al., 2019; Wijayanti et al., 2019). Through the circulation of the "stick," students are encouraged to take turns expressing ideas, responding to questions, and negotiating meaning in a supportive social setting, thereby fostering a more dynamic and inclusive classroom atmosphere (Carr et al., 2024; Ridgeway & Jacques, 2015). The competitive and unexpected nature of turn-taking inherent in Talking Stick-based activities has also been shown to stimulate sustained attention and emotional investment in learning tasks (Bos et al., 2021).

Parallel to developments in cooperative learning, the integration of digital technology has become indispensable in addressing the learning preferences of the digital native generation. QR Code technology, in particular, has been widely adopted in educational contexts to expand access to learning resources, facilitate self-paced study, and increase student autonomy in exploring content (Abed El monaem & Aljarousha, 2024; Lai et al., 2023). In the domain of cultural and disciplinary education, QR Codes enable students to access multimodal materials—such as folklore, regional dances, traditional songs, and contextual explanations—in visual, auditory, and interactive formats that support affective as well as cognitive dimensions of learning (AlNajdi, 2022; Arum et al., 2023; Dabke et al., 2021; Masih, 2022; Savitri et al., 2021). These studies indicate that QR Code-based media can enhance motivation, problem-solving skills, and scientific or disciplinary literacy when appropriately designed.

However, the existing literature on Talking Stick and QR Code-based interventions has several limitations when examined from the perspective of Indonesian migrant children's education. Most Talking Stick studies have been conducted in mainstream school settings within the home country, focusing on cognitive outcomes such as critical thinking, discipline, or interest in specific subjects, with minimal attention to cultural identity formation or transnational learner contexts. Likewise, many QR Code-enhanced learning studies emphasize subject-specific competencies (e.g., science literacy, programming skills, or physical education interest) and digital engagement (Abed El monaem & Aljarousha, 2024; Arum et al., 2023; Savitri et al., 2021; Rihatno et al., 2023), but rarely address how such technologies can systematically mediate cultural content for diasporic communities. While technology-based and participatory learning is increasingly recognized as essential for creating enjoyable and meaningful learning experiences (Dehn et al., 2020; Goggin & Wilken, 2024; Rawlins & Seaman, 2024), studies that explicitly combine cooperative game models with QR Code-delivered cultural resources for migrant children remain scarce.

Overall, the literature suggests that significant progress has been made in cooperative, game-based learning and QR Code-mediated instruction, yet these strands of research tend to evolve separately. Studies on Talking Stick highlight its strengths in promoting interaction, confidence, and participation, while studies on QR Code-based media emphasize flexibility, accessibility, and multimodal enrichment of learning materials (Kuru Gönen & Zeybek, 2022; Solihatin et al., 2021). Few studies, however, systematically integrate these approaches into a unified pedagogical model that explicitly targets both cultural literacy and learning motivation in transnational school settings. This gap opens a space for research that can design, implement, and evaluate a culture-based gamified learning model tailored to the lived realities of Indonesian migrant children at institutions such as SIKL and its affiliated learning studios.

This study differs from previous research by combining the Talking Stick cooperative learning method and the Mystery Box game with QR Code-based cultural content as an integrated model to strengthen cultural literacy and enhance learning motivation among Indonesian migrant children. The research is theoretically justified by evidence that game-based cooperative strategies foster engagement and confidence (Ifrianti et al., 2020; Novianto et al., 2019; Wijayanti et al., 2019; Bos et al., 2021), and that QR Code-mediated resources can significantly increase motivation and independent exploration of learning materials (Abed El monaem & Aljarousha, 2024; Arum et al., 2023; Savitri et al., 2021). The scope of this study focuses on children of Indonesian migrant workers attending the Sentul Guidance Studio at SIKL, examining their responses to a structured program that embeds Indonesian cultural narratives, symbols, and practices within a gamified, technology-supported learning environment.

Accordingly, the primary objective of this study is to develop and evaluate an interactive, gamified QR-based cultural literacy model to enhance the learning motivation and cultural understanding of Indonesian migrant children in Malaysia. Specifically, the study seeks to answer the following research questions: (1) How is the Talking Stick and Mystery Box-integrated QR Code learning model designed and implemented in the context of the Sentul Guidance Studio at SIKL? (2) To what extent does this model influence students' motivation to learn as reflected in their engagement and self-reported motivation levels? and (3) To what extent does the model improve students' cultural literacy and sense of attachment to Indonesian national identity? The answers to these questions are expected to contribute to both theoretical development in culture-based, technology-enhanced learning and practical efforts to support the educational and cultural needs of Indonesian migrant children in transnational settings.

## **Research Methods**

### **Research Design and Approach**

This study employed a qualitative descriptive design with a participatory–collaborative, community-based orientation to address the learning and cultural literacy problems faced by Indonesian migrant children. The research was structured as a cyclical program consisting of four main stages: problem identification, learning media development, implementation, and evaluation, which are aligned with principles of action research and contextual learning (Bos et al., 2021; Carr et al., 2024). This design was selected to ensure that the intervention model—integrating the Talking Stick and Mystery Box game methods with QR Code–based cultural content—could be developed and refined together with practitioners in an authentic learning environment.

### **Research Site and Participants**

The study was conducted at the Sentul Guidance Studio of Sekolah Indonesia Kuala Lumpur (SIKL), Malaysia, over the course of one month in 2025. The research involved Indonesian migrant children enrolled at the studio as primary participants, and teachers as well as the studio head as key partners in the planning, implementation, and reflection stages (Naseri et al., 2021; Spindler et al., 2022). The selection of this site was based on its status as a learning center serving children of Indonesian migrant workers with limited access to culture-based and technology-enhanced learning resources. The active involvement of teachers and the studio head in all stages of implementation also aimed to strengthen the contextual relevance, validity, and sustainability of the program (Alaca & Çelik, 2023; Goggin & Wilken, 2024; Rawlins & Seaman, 2024).

### **Development of Gamified QR-Based Learning Media**

In the media development stage, the Talking Stick and Mystery Box methods were used to create an interactive, game-based learning atmosphere. The Talking Stick model, as a cooperative learning strategy, has been shown to increase student engagement, self-confidence, and discipline in various educational contexts (Ifrianti et al., 2020; Novianto et al., 2019; Ridgeway & Jacques, 2015; Wijayanti et al., 2019). Building on this evidence, the Mystery Box was incorporated to add elements of curiosity and surprise, thereby amplifying emotional and cognitive involvement (Bos et al., 2021). In parallel, QR Code–based digital media were designed to package Indonesian cultural materials—such as folklore, traditional dances, regional songs, symbolic images, and contextual texts—into short, accessible learning objects (Abed El monaem & Aljarousha, 2024; AlNajdi, 2022; Lai et al., 2023; Tan & Chee, 2021). These materials were prepared so that students could scan the QR Codes using mobile devices to access content repeatedly and flexibly, in line with the learning characteristics of digital native learners.

### **Implementation Procedures**

The implementation stage was carried out directly with students through a structured sequence of learning sessions combining games, small-group discussions, and independent exploration of QR Code content. In each session, the Talking Stick and Mystery Box were used to initiate and guide cooperative learning activities, stimulate participation, and encourage students to share their understanding of cultural narratives. The game methods were intended to build enthusiasm and reduce anxiety, while QR Codes were used to facilitate self-paced learning and to offer multimodal explanations that reinforced key cultural concepts (Masih, 2022; Rihatno et al., 2023; Savitri et al., 2021; Zheng & Ma, 2022). The use of QR Codes in this context was designed to strengthen information retention through multi-sensory stimulation and visual–auditory narratives that contextualize cultural content in ways that are meaningful for migrant children (Dabke et al., 2021; Nguyen et al., 2024).

### **Materials and Instruments**

The main instructional materials comprised (1) a set of Talking Stick and Mystery Box game tools adapted to cultural literacy themes, and (2) QR Code sheets linked to curated digital content hosted on accessible online platforms. Supplementary printed worksheets were used to guide reflection on cultural stories, symbols, and values. Research instruments included a Likert-scale questionnaire to measure students' learning motivation and perceived cultural understanding, observation sheets for participatory classroom observation, and semi-structured interview guides for follow-up conversations with selected students and teachers. The design of these instruments drew on previous work on motivation, behavior change, and educational engagement in technology-enhanced environments (Dehn et al., 2020; Hankonen, 2021; Spindler et al., 2022; Xu & Liu, 2025; Zhang et al., 2023).

### **Data Collection Techniques**

Data collection was conducted using a triangulation of methods: Likert-scale questionnaires, participatory observation, and interviews. The questionnaire was administered to capture students' self-reported motivation to learn and perceived improvement in cultural understanding after participating in the program (Haliburton et al., 2023; Roberts et al., 2020). Participatory observation was carried out by the researchers and teachers during learning sessions to document students' behavioral indicators of engagement, interaction patterns, and responses to the game-based and QR Code-based activities. Semi-structured interviews were then conducted with selected students and teachers to explore in greater depth the perceived benefits, challenges, and contextual relevance of the learning model. These interviews also provided narrative accounts of how the activities influenced students' attitudes toward Indonesian culture (Davenport, 2000; Lachance & Couture, 2019; Peterson & Barron, 2007).

### **Data Analysis**

Quantitative data from the Likert-scale questionnaires were analyzed using descriptive statistics to generate frequency distributions and percentages that describe levels of motivation and cultural understanding before and after the intervention. These results were used to identify dominant trends and the proportion of students experiencing positive change. Qualitative data from observations and interviews were analyzed through thematic coding, focusing on patterns of student participation, expressions of cultural pride, and the perceived usefulness of the gamified QR-based learning media. The integration of quantitative and qualitative findings enabled a comprehensive understanding of how the model operated in practice and how it influenced both cognitive and affective dimensions of learning (Choudhury & Rabbani, 2020; Faradillah & Rizkia, 2024; Kuru Gönen & Zeybek, 2022; Zhang et al., 2023).

### **Data Validity and Reliability**

To ensure the validity and reliability of the findings, methodological triangulation was applied by combining questionnaire data, observational records, and interview transcripts (Haliburton et al., 2023; Hankonen, 2021; Roberts et al., 2020). The involvement of teachers and the studio head in reflecting on the results also functioned as a form of member checking, allowing key stakeholders to confirm or refine the researchers' interpretations (Alaca & Çelik, 2023; Naseri et al., 2021). In line with the principles of experiential and participatory learning, continuous feedback from participants was used to adjust the implementation and to ensure that the intervention remained responsive to the needs and realities of migrant children (Dehn et al., 2020; Goggin & Wilken, 2024; Rawlins & Seaman, 2024). This multi-perspective validation process reinforced the robustness of the conclusions drawn from the study and supported the claim that the model is both contextually grounded and potentially transferable to similar migrant learning environments.

## Results

### Increased Learning Motivation through Talking Stick–Based Mystery Box Activities

The implementation of the Talking Stick game combined with the Mystery Box activity led to a marked increase in students' learning motivation. During the sessions, children received Indonesian cultural materials and participated in games that required them to answer questions at random when the stick was passed to them. This structure created a pleasant, low-anxiety learning atmosphere and visibly heightened behavioral engagement. Consistent with previous evidence, the Talking Stick model facilitated increased attention, confidence in expressing ideas, and more equitable participation among students (Ifrianti et al., 2020; Novianto et al., 2019; Wijayanti et al., 2019). The cooperative nature of the activity aligns with the concept of social interaction–driven motivation, where emotional involvement and peer support foster a more dynamic and inclusive classroom climate (Carr et al., 2024; Ridgeway & Jacques, 2015). The psychological effect of not knowing when it would be one's turn to speak also helped sustain focus and mental readiness (Bos et al., 2021).

Descriptive analysis of the questionnaire data indicates that 87% of children reported being “highly motivated” or “motivated” after participating in the program. Only 11.11% indicated a “mediocre” level of motivation, and no students reported being “less motivated” or “unmotivated.” These results demonstrate the effectiveness of the game-based cooperative strategy in increasing perceived motivation and engagement. Similar to findings that highlight how active group participation shapes positive perceptions of learning and strengthens a sense of belonging (Bos et al., 2021; Carr et al., 2024), observations in this study showed that students were more willing to volunteer answers, ask questions, and support peers during activities. The distribution of responses is presented in Table 1.

Table 1. Evaluation of Students' Learning Motivation

Category	Number of Students	Percentage (%)
Highly motivated	7	38.89
Motivated	9	50.00
Mediocre	2	11.11
Less motivated	0	0.00
Unmotivated	0	0.00
Total	18	100

### Increased Cultural Understanding through QR Code–Based Digital Literacy

Cultural literacy activities were organized through the use of QR Code technology, enabling students to access videos, images, and digital texts containing Indonesian cultural content such as folklore, traditional dances, regional songs, and representations of Indonesian clothing and food. This approach allowed children, as digital natives, to interact with cultural material in a flexible, self-directed, and visually rich manner. Existing studies have shown that QR Codes can enhance learning motivation, accelerate mastery of content, and support autonomous learning behaviors (Abed El monaem & Aljarousha, 2024; AlNajdi, 2022; Lai et al., 2023). In line with these findings, 83% of students in this study reported that they “understood” or “strongly understood” the cultural content after the intervention.

The effectiveness of QR Code media has been documented across various educational contexts, including the improvement of science literacy (Savitri et al., 2021), historical understanding (Arum et al., 2023), and interactive engagement in learning (Masih, 2022; Rihatno et al., 2023). In this study, the visual, auditory, and narrative features of the digital resources appeared to strengthen concept formation and deepen students' cultural learning experiences (Dabke et al., 2021; Tan & Chee, 2021). Students frequently replayed videos, revisited images, and shared favorite cultural stories with peers, indicating

active and repeated engagement with the materials. The distribution of cultural understanding levels is presented in Table 2.

Table 2. Evaluation of Students' Understanding of Indonesian Culture

Category	Number of Students	Percentage (%)
Strongly understand	6	33.33
Understand	9	50.00
Mediocre	3	16.67
Limited understanding	0	0.00
Do not understand	0	0.00
Total	18	100

### Partner Participation and Perceived Usefulness of the Program

Partner participation emerged as a critical factor in the successful implementation of the program. The studio head and teachers were actively involved in planning, coordinating, and facilitating classroom activities, as well as in monitoring students' responses to the new methods and media. Their engagement ensured that the intervention was contextually appropriate and aligned with the daily routines of the Sentul Guidance Studio.

Program evaluation using a Likert-scale questionnaire indicated that 89% of participants perceived the activities as "very helpful" or "helpful." Only 11.11% rated the activities as "mediocre," and no students evaluated the program as "less useful" or "not useful." These results resonate with previous research emphasizing that supportive learning environments and committed facilitators are central to shaping positive learning experiences (Dabke et al., 2021; Naseri et al., 2021). In addition, the willingness of partners to continue using the Talking Stick-based games and QR Code media as part of routine instruction suggests strong potential for long-term sustainability. This aligns with studies showing that the success of educational innovations is largely determined by local acceptance and the ongoing initiatives of teaching staff (Alaca & Çelik, 2023; Goggin & Wilken, 2024). The perceived usefulness ratings are summarized in Table 3.

Table 3. Evaluation of the Perceived Usefulness of the Program

Rating category	Number of Students	Percentage (%)
Very helpful	10	55.56
Helpful	6	33.33
Mediocre	2	11.11
Less useful	0	0.00
Not useful	0	0.00
Total	18	100.00

### Overall Program Impact and Preliminary Conceptual Synthesis

Beyond single indicators of motivation and cultural understanding, the program yielded broader impacts related to students' cognitive, affective, and social dimensions of learning. Prior to implementation, only 32% of students reported high interest in cultural learning, and approximately 40% indicated that they adequately understood Indonesian cultural content. Following the intervention, 87% of students reported increased motivation to learn and 83% demonstrated better cultural understanding. These shifts are consistent with previous findings on the effectiveness of interactive, game-based methods in enhancing students' enthusiasm and engagement (Ifrianti et al., 2020; Wijayanti et al., 2019; Carr et al., 2024; Ridgeway & Jacques, 2015).

Observation and interview data further revealed changes in classroom interaction patterns. Students who were initially passive became more confident and willing to speak in front of peers,

supported by the structured turn-taking of the Talking Stick and the cooperative nature of the games (Davenport, 2000; Haliburton et al., 2023; Novianto et al., 2019). The integration of QR Codes enabled students to access cultural content in a flexible and enjoyable manner, reinforcing learning independence and efficient use of study time (Abed El monaem & Aljarousha, 2024; Lai et al., 2023; Tan & Chee, 2021; Rawlins & Seaman, 2024; Savitri et al., 2021).

From a programmatic perspective, collaboration with community partners proved crucial for ensuring continuity and ownership of the innovation (Spindler et al., 2022; Naseri et al., 2021). Triangulated evaluation methods—combining Likert-scale data, participatory observation, and interviews—strengthened the validity of the findings (Bos et al., 2021; Dehn et al., 2020; Lachance & Couture, 2019; Peterson & Barron, 2007; Hankonen, 2021; Roberts et al., 2020). Overall, the results indicate that technology- and culture-based learning can be an effective strategy for strengthening national identity and cultural appreciation among children living abroad (AlNajdi, 2022; Choudhury & Rabbani, 2020; Dabke et al., 2021; Nguyen et al., 2024; Solihatin et al., 2021). Conceptually, these findings support the argument that contextual, creative, and collaborative learning approaches are capable of addressing educational challenges in marginalized and migrant communities (Arum et al., 2023; Kuru Gönen & Zeybek, 2022; Masih, 2022), and they provide an empirical basis for developing a more detailed concept map of how gamified cooperative learning and QR Code-based media jointly contribute to cultural literacy and learning motivation in transnational settings.

## Discussion

The findings of this study demonstrate that the integration of the Talking Stick and Mystery Box cooperative game model with QR Code-based cultural media can substantially enhance both learning motivation and cultural literacy among Indonesian migrant children. From a motivational perspective, the significant proportion of students who reported being “highly motivated” or “motivated” aligns with theories emphasizing the role of active engagement, social interaction, and emotional involvement in sustaining learning behavior (Dehn et al., 2020; Hankonen, 2021). The structured yet playful turn-taking mechanism of the Talking Stick encourages all students to participate, thereby reducing anxiety and supporting a sense of competence and relatedness, which are central to motivational and behavior-change frameworks (Bos et al., 2021; Carr et al., 2024).

The role of the Talking Stick in this study corroborates previous evidence that cooperative, game-based learning strategies can increase students’ discipline, self-confidence, and interest in academic content (Ifrianti et al., 2020; Novianto et al., 2019; Wijayanti et al., 2019). By requiring students to speak when receiving the stick, the activity redistributes classroom authority and creates a more democratic space for participation, resonating with broader discussions of the Talking Stick as a tool for inclusive dialogue and negotiated meaning (Davenport, 2000; Ridgeway & Jacques, 2015; Lachance & Couture, 2019). The observed shift from passive to more confident and vocal participation in this study echoes findings on group-based tasks and social feedback, which show that carefully structured interaction can foster belonging and positive perceptions of learning (Bos et al., 2021; Carr et al., 2024).

The QR Code-based component of the intervention also aligns with contemporary research on technology-enhanced learning, particularly for digital native learners. The high percentage of students who reported improved understanding of Indonesian culture is consistent with studies demonstrating that QR Code technology can increase motivation, content mastery, and autonomy in learning (Abed El monaem & Aljarousha, 2024; Lai et al., 2023; Tan & Chee, 2021). The multimodal nature of the materials—integrating text, images, audio, and video—supports both cognitive and affective engagement, similar to earlier findings on QR Code media in science literacy, history, and other domains (Dabke et al., 2021; Savitri et al., 2021; Arum et al., 2023; Rihatno et al., 2023). In particular, the ability

to repeatedly access and replay cultural content parallels evidence that QR Code-based resources enhance independent learning and time-efficient study habits (Masih, 2022; Rawlins & Seaman, 2024).

Beyond generic digital literacy, the present findings underscore the potential of QR Code media to mediate cultural content and identity formation in transnational settings. Prior studies have shown that QR Codes and related technologies can embed rich information, structure user interaction, and shape experiences in diverse contexts, from security systems to everyday digital services (Choudhury & Rabbani, 2020; Hill & Whitty, 2021; Goggin & Wilken, 2024; Nguyen et al., 2024; Zheng & Ma, 2022). In this study, QR Codes were not merely technical tools but gateways to Indonesian folklore, dances, songs, and cultural symbols, thereby supporting character education and values internalization in ways that resonate with QR-based character education and authentic text approaches reported elsewhere (Solihatn et al., 2021; Kuru Gönen & Zeybek, 2022). The students' enthusiasm for exploring cultural content and sharing it with peers suggests that such media can serve as an affective bridge between everyday digital practices and the preservation of national identity.

Taken together, the integration of cooperative game methods and QR Code-based media produced a synergistic effect: the Talking Stick and Mystery Box created emotionally engaging social situations, while QR Codes provided flexible, multimodal access to substantive cultural material. This synergy mirrors broader insights from research on tailored education and digital services, which highlight that personalization and contextual relevance are key to increasing motivation and engagement (Naseri et al., 2021; Spindler et al., 2022). The findings of this study extend such insights to the specific context of Indonesian migrant children by demonstrating that when technology is coupled with culturally meaningful content and collaborative pedagogy, it can support both motivation and cultural literacy rather than displacing local cultural references (Zhang et al., 2023).

The authors therefore argue that the model developed in this study constitutes a context-responsive, culturally grounded, and pedagogically robust approach to educating children in migrant communities. In contrast to many technology-driven initiatives that focus primarily on cognitive outcomes or generic digital skills, this model explicitly targets cultural identity and motivation through experiential, game-based, and collaborative learning (Dehn et al., 2020; Faradillah & Rizkia, 2024). The findings position the Talking Stick- and Mystery Box-integrated QR Code model as a promising framework for designing learning environments in which migrant children can both enjoy learning and strengthen their ties to Indonesian cultural heritage. From a socio-cultural perspective, this approach aligns with interpretations that emphasize the mediation of goals, values, and practices within specific cultural and institutional settings (Xu & Liu, 2025).

At the same time, the study has practical implications for schools and learning centers serving Indonesian migrant workers' children. First, institutions such as the Sentul Guidance Studio and similar centers abroad should consider institutionalizing gamified, culture-based QR Code activities as part of their regular curricula, rather than treating them as one-off projects. This requires investment in teacher training, collaborative design processes, and basic digital infrastructure to ensure that QR Code activities are pedagogically meaningful and technically reliable (Alaca & Çelik, 2023; Rawlins & Seaman, 2024). Second, policy-makers and educational stakeholders could promote guidelines and resource packages that support the development of localized cultural content in QR Code formats, drawing on existing models in science, history, and character education (Savitri et al., 2021; Arum et al., 2023; Solihatn et al., 2021).

Finally, the study suggests several directions for future research and program refinement. The present work was conducted in a single learning center with a relatively small sample, and relied heavily on self-report and descriptive analyses. Subsequent studies could employ more rigorous experimental or quasi-experimental designs, larger and more diverse samples, and longitudinal follow-up to examine the durability of motivational and cultural literacy gains (Naseri et al., 2021; Spindler et al., 2022;

Roberts et al., 2020). Further investigations might also explore how factors such as gender, length of stay abroad, family background, and prior exposure to cultural content influence the effectiveness of gamified QR-based interventions (Faradillah & Rizkia, 2024; Zhang et al., 2023). Despite these limitations, the present study provides a strong empirical basis for advancing a contextual, creative, and collaborative model of cultural education for Indonesian migrant children, and offers concrete recommendations for practitioners and policy-makers seeking to address the complex educational challenges faced by marginalized and transnational communities (Arum et al., 2023; Kuru Gönen & Zeybek, 2022; Masih, 2022).

### Conclusion

This study demonstrated that the integrated Talking Stick– and Mystery Box–based cooperative learning model, combined with QR Code–mediated cultural content, effectively enhanced both learning motivation and cultural literacy among Indonesian migrant children at the Sentul Guidance Studio, Sekolah Indonesia Kuala Lumpur. In line with the research objectives, the findings showed that 87% of students reported higher levels of motivation to learn and 83% indicated improved understanding of Indonesian culture, supported by observable changes in participation, confidence, and engagement during learning activities. The active involvement of teachers and the studio head further confirmed the contextual relevance, feasibility, and perceived usefulness of the model in a resource-limited migrant education setting.

The key implication of these findings is that culturally grounded, gamified, and technology-enhanced learning can serve as a strategic avenue for strengthening national identity and sustaining educational participation among children living abroad. This study contributes to the existing body of knowledge by offering an empirically tested pedagogical model that systematically integrates cooperative educational games with QR Code–based cultural resources in a transnational context. Future research should extend this work through larger and more diverse samples, comparative or longitudinal designs, and deeper examination of mediating factors such as gender, duration of migration, and family background, in order to refine the model and assess its transferability to other migrant communities and educational levels.

### Acknowledgments

The author gratefully acknowledges the financial support provided by Universitas Muhammadiyah Makassar, which made this study possible. Sincere appreciation is also extended to Sekolah Indonesia Kuala Lumpur (SIKL), particularly the Sentul Guidance Studio, as well as the studio head and accompanying teachers for their invaluable assistance, access, and collaboration throughout the planning and implementation of this program. The enthusiastic participation and support of the students and their parents are likewise deeply appreciated and recognized as a key factor in the success of this initiative.

### REFERENCES

- Abed El monaem, R. A., & Aljarousha, H. (2024). The Effectiveness of QR code Technology in Developing Digital Game Programming Skills in the Programming Curriculum and Motivation Towards Digital Transformation Among Fifth Grade Students. *An-Najah University Journal for Research - B (Humanities)*, 38(2), 371–402. <https://doi.org/10.35552/0247.38.2.2154>
- Alaca, Y., & Çelik, Y. (2023). Cyber attack detection with QR code images using lightweight deep learning models. *Computers and Security*, 126. <https://doi.org/10.1016/j.cose.2022.103065>
- AlNajdi, S. M. (2022). The effectiveness of using augmented reality (AR) to enhance student performance: using quick response (QR) codes in student textbooks in the Saudi education

- system. *Educational Technology Research and Development*, 70(3), 1105–1124. <https://doi.org/10.1007/s11423-022-10100-4>
- Arum, W. S. A., Ramadhina, K., Marini, A., Safitri, D., & Dewiyani, L. (2023). Managing Fourth-Grade Elementary School Students' Learning Motivation through Scrapbook Media-Based QR Code in Social Studies. *Eurasian Journal of Educational Research*, 2023(106), 232–250. <https://doi.org/10.14689/ejer.2023.106.014>
- Bos, D. J., Barnes, E. D., Silver, B. M., Ajodan, E. L., Clark-Whitney, E., Scult, M. A., Power, J. D., & Jones, R. M. (2021). An effort-based social feedback paradigm reveals aversion to popularity in socially anxious participants and increased motivation in adolescents. *PLoS ONE*, 16(4 April 2021). <https://doi.org/10.1371/journal.pone.0249326>
- Carr, S. E., Wilson, T. E., Slone, S. A., Karanja, L. W., & Osterhage, J. L. (2024). Assigned group work is associated with increased student motivation and perceptions of belonging in an asynchronous online physiology laboratory course. *Advances in Physiology Education*, 48(3), 593–602. <https://doi.org/10.1152/advan.00064.2024>
- Choudhury, Z. H., & Rabbani, M. M. A. (2020). Biometric Passport for National Security Using Multibiometrics and Encrypted Biometric Data Encoded in the QR Code. *Journal of Applied Security Research*, 15(2), 199–229. <https://doi.org/10.1080/19361610.2019.1630226>
- Dabke, R. B., Harrell, M., Melaku, S., Ray, L., & Turner, H. (2021). QR Code Labels and Audio Commentaries for Commonly Used Chemistry Laboratory Apparatus: An Assisted Learning Experience for Visually Impaired Students. *Journal of Chemical Education*, 98(10), 3395–3399. <https://doi.org/10.1021/acs.jchemed.1c00058>
- Davenport, S. (2000). From Big Sticks to Talking Sticks: Family, Work, and Masculinity in Stephen King's *The Shining*. *Men and Masculinities*, 2(3), 308–329. <https://doi.org/10.1177/1097184X00002003004>
- Dehn, L. B., Driessen, M., & Beblo, T. (2020). Patients with major depression show greater memory improvement if motivation is increased: An exploratory study under real-life-like conditions. *Journal of Clinical and Experimental Neuropsychology*, 42(3), 307–318. <https://doi.org/10.1080/13803395.2020.1711874>
- Faradillah, A., & Rizkia, P. A. (2024). Mathematical Understanding Concepts Ability in QR Code-Assisted Problem Solving by Gender. *Mathematics Education Journal*, 18(3), 313–328. <https://doi.org/10.22342/jpm.v18i3.pp313-328>
- Goggin, G., & Wilken, R. (2024). QR codes and automated decision-making in the COVID-19 pandemic. *New Media and Society*, 26(3), 1268–1289. <https://doi.org/10.1177/14614448231201649>
- Haliburton, L., Bartłomiejczyk, N., Schmidt, A., Woźniak, P. W., & Niess, J. (2023). The Walking Talking Stick: Understanding Automated Note-Taking in Walking Meetings. *Conference on Human Factors in Computing Systems - Proceedings*. <https://doi.org/10.1145/3544548.3580986>
- Hankonen, N. (2021). Participants' enactment of behavior change techniques: a call for increased focus on what people do to manage their motivation and behavior. *Health Psychology Review*, 15(2), 185–194. <https://doi.org/10.1080/17437199.2020.1814836>
- Hill, G. N., & Whitty, M. A. (2021). Embedding metadata in images at time of capture using physical Quick Response (QR) codes. *Information Processing and Management*, 58(3). <https://doi.org/10.1016/j.ipm.2021.102504>
- Ifrianti, S., Shawmi, A. N., Asiah, N., Asyhari, A., Putri, L., & Komikesari, H. (2020). The Effect Size Test of Talking Stick Learning Model on Students' critical thinking skills. *Journal of Physics: Conference Series*, 1467(1). <https://doi.org/10.1088/1742-6596/1467/1/012061>
- Kuru Gönen, S. İ., & Zeybek, G. (2022). Using QR code enhanced authentic texts in EFL extensive reading: a qualitative study on student perceptions. *Education and Information Technologies*, 27(2), 2039–2057. <https://doi.org/10.1007/s10639-021-10695-w>
- Lachance, L., & Couture, S. (2019). Transformational kinstellatory relations and the talking stick festival. *Theatre Research in Canada-Recherches Théatrales Au Canada*, 40(1–2), 10–26. [https://doi.org/10.3138/tric.40.1\\_2.10](https://doi.org/10.3138/tric.40.1_2.10)
- Lai, L., Liu, L., Wang, Y., Liu, S., Zhang, J., & Zheng, X. (2023). QR code technology in individual identification training provides an introduction in hands-on forensic DNA genotyping to medical students. *BMC Medical Education*, 23(1). <https://doi.org/10.1186/s12909-023-04284-3>

- Masih, E. A. (2022). Feasibility of using QR code for registration & evaluation of training and its ability to increase response rate – The learners' perception. *Nurse Education Today*, 111. <https://doi.org/10.1016/j.nedt.2022.105305>
- Naseri, C., McPhail, S. M., Morris, M. E., Haines, T. P., Etherton-Beer, C., Shorr, R., Flicker, L., Bulsara, M., Lee, D.-C. A., Francis-Coad, J., Waldron, N., & Hill, A.-M. (2021). Tailored Education Increased Capability and Motivation for Fall Prevention in Older People After Hospitalization. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.683723>
- Nguyen, T. H., Ngo, H. Q., Vuong, C. D., & Phan, T. L. A. (2024). Determinants of consumer's adoption to use QR code-based virtual supermarket—The moderating effect of perception risk. *Journal of Infrastructure, Policy and Development*, 8(8). <https://doi.org/10.24294/jipd.v8i8.6713>
- Novianto, V., Febriani, E. D., & Utami, N. W. (2019). The increase of students discipline, self-confidence, and interest in Indonesian history learning through the talking stick model. *International Journal of Scientific and Technology Research*, 8(12), 1814–1816. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85077336767&partnerID=40&md5=11175f2bc19a355975fafdd542456156>
- Peterson, E. R., & Barron, K. A. (2007). How to Get Focus Groups Talking: New Ideas that will Stick. *International Journal of Qualitative Methods*, 6(3), 140–144. <https://doi.org/10.1177/160940690700600303>
- Rawlins, L. N., & Seaman, K. A. (2024). The Use of QR Codes to Engage Nursing Students With Next Generation NCLEX. *Journal of Nursing Education*, 63(3), 186–187. <https://doi.org/10.3928/01484834-20240108-02>
- Ridgeway, S. J., & Jacques, P. J. (2015). The power of the talking stick: Indigenous politics and the world ecological crisis. In *The Power of the Talking Stick: Indigenous Politics and the World Ecological Crisis*. <https://doi.org/10.4324/9781315632636>
- Rihatno, T., Putri, F. N., Marini, A., Sagita, J., Safitri, D., & Dewiyani, L. (2023). QR Code-Based Interactive E-Book in Increasing Interest in Physical Education. *Eurasian Journal of Educational Research*, 2023(104), 125–141. <https://doi.org/10.14689/ejer.2023.104.008>
- Roberts, A. R., Ishler, K. J., & Adams, K. B. (2020). The predictors of and motivations for increased family involvement in nursing homes. *Gerontologist*, 60(3), 535–547. <https://doi.org/10.1093/geront/gny158>
- Savitri, E. N., Amalia, A. V., Prabowo, S. A., Rahmadani, O. E. P., & Kholidah, A. (2021). The effectiveness of real science mask with qr code on students' problem-solving skills and scientific literacy. *Jurnal Pendidikan IPA Indonesia*, 10(2), 209–219. <https://doi.org/10.15294/jpii.v10i2.29918>
- Solihatin, E., Siang, J. L., Syarifain, R. I., pian, A. L., Wuwung, O. C., Putri, K. Y. S., Tulung, J. M., Kuncoro, E. A., & Dapa, A. N. (2021). Development of Qr Code-Based Character Education Teaching Materials. *Review of International Geographical Education Online*, 11(5), 4095–4104. <https://doi.org/10.48047/rigeo.11.05.290>
- Spindler, H., Dyrvig, A.-K., Schacksen, C. S., Anthonimuthu, D., Frost, L., Gade, J. D., Kronborg, S. H., Mahboubi, K., Refsgaard, J., Dinesen, B., Hollingdal, M., & Kayser, L. (2022). Increased motivation for and use of digital services in heart failure patients participating in a telerehabilitation program: a randomized controlled trial. *MHealth*, 8. <https://doi.org/10.21037/mhealth-21-56>
- Tan, K. H., & Chee, K. M. (2021). Exploring the motivation of pupils towards the implementation of QR codes in pronunciation learning. *Academic Journal of Interdisciplinary Studies*, 10(1), 204–213. <https://doi.org/10.36941/ajis-2021-0018>
- Wijayanti, L., Sukwatus Sujai, I., & Septi Nur Afifah, D. (2019). Effect of cooperative learning model type of talking stick against student learning. *Journal of Physics: Conference Series*, 1339(1). <https://doi.org/10.1088/1742-6596/1339/1/012083>
- Xu, Y., & Liu, J. (2025). Understanding doctoral supervisors' understanding of supervisory goals in China: a social-cultural interpretation. *Higher Education*. <https://doi.org/10.1007/s10734-025-01422-2>
- Zhang, Q., Elsweller, D., & Trattner, C. (2023). Understanding and predicting cross-cultural food preferences with online recipe images. *Information Processing and Management*, 60(5). <https://doi.org/10.1016/j.ipm.2023.103443>

Zheng, H., & Ma, W. (2022). Scan the QR Code of Happiness: Can Mobile Payment Adoption Make People Happier? *Applied Research in Quality of Life*, 17(4), 2299–2310.  
<https://doi.org/10.1007/s11482-022-10036-0>