

The Digital Bridge: Perceived Impact of Digital Literacy on Intercultural Communicative Competence (ICC) among Malaysian ESL Learners

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ABSTRACT

In the present era of internationalisation, fostering Intercultural Communicative Competence (ICC) through digital education is essential particularly for English as a Second Language (ESL) learners in Malaysia's multicultural context. This aligns with the Sustainable Development Goals (SDGs) indicator 4.4.1, which focuses on skills for a digital world. This study examines the perceived impact of digital literacy on intercultural communicative competence among ESL learners in higher education. By employing a qualitative approach, data were collected from a sample of eleven participants through open-ended questionnaires and were then analysed thematically. Findings revealed that communication tools were the most preferred digital literacy tools for cross-cultural interaction and cultural awareness as conceptualised in Byram's ICC model. Participants reported positive experiences in using digital platforms to improve their intercultural competencies. The study also highlighted that fostering learners' digital literacy is crucial for promoting cultural tolerance, improving communication skills, and facilitating knowledge exchange. This research hopes to contribute to the existing literature and offer insights for educators in implementing digital tools to enhance students' intercultural communication skills in the ESL classroom pedagogy for global citizenship.

1. INTRODUCTION

Language and culture are two important aspects of learning in today's interconnected world. In the context of Malaysian education, learners engage in a rich and culturally diverse environment interacting with peers and educators from various cultural differences. Such an environment allows individuals to not only reflect and understand their own culture, but also others' culture in navigating differences (Nur Rakhmawati, et al. 2020). This leads to the development of intercultural communication for individuals to communicate

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competently in a fully functioning multicultural setting (Lysiuchenko, et. al, 2021). This interaction creates opportunities for learners to further embrace norms and values practiced by other cultures.

Interestingly, the rapid development of global transformation and technical advancement further leads to the need for digital literacy skills in today's world. The ability to effectively navigate and communicate in a digital environment is crucial for individuals to survive the intense competition in this digital age. The demand of this digital age suggests that it is essential to enhance digital competencies, especially in the areas of communication, pedagogy, and instructional strategies (Tejedor et al., 2020). This idea aligns with the Sustainable Development Goals (SDGs), specifically the target concept for indicator 4.4.1, which highlights the importance of developing digital skills (UNESCO, 2019). This lays the foundation for Digital Sustainability, where sustainable communication gradually plays a significant role through the use of various digital channels in the evolving context of today (Siano et al., 2016). Ultimately, the integration of intercultural competence and digital skills within the educational experience prepares learners to be global citizens capable of creating significant impacts in diverse societies.

While digital literacy and intercultural communicative competence have been studied independently (Elboubekri, 2017; Kim et al., 2019), few studies have explored the perceived role of digital literacy in developing ICC among ESL learners. Most existing research focused on either technology adoption or intercultural competence, but limited attention is given to how Malaysian ESL learners, situated in a multilingual and multicultural society, experience this intersection. This lack of focus creates a gap in understanding how digital skills directly contribute to intercultural communicative competence, particularly in Malaysian higher education contexts. To address this gap, the present study aims to investigate the perceived impact of digital literacy on intercultural communicative competence among Malaysian ESL learners. Specifically, it examines (a) which digital tools learners find effective for intercultural interaction, and (b) how these tools impact their ICC development in multicultural classroom environments.

2. LITERATURE REVIEW

To support sustainable digitalisation, the role of digital literacy is significant in the digital learning environment. According to Farina Tazijan (2022), digital literacy can be defined as the knowledge and ability to utilise a plethora of technology tools for various purposes by incorporating digital skills for 21st-century learning. In a study conducted to investigate the levels of Digital Literacy among Vietnamese students, it was found that students generally have a positive attitude towards technology and achieved an adequate level of knowledge regarding digital literacy (Lan & Habók, 2022). This is further enhanced using digital tools such as Social and Media tools, search engines and online learning platforms among others, to leverage knowledge and understanding in learning (Lan & Habók, 2022). In another study by Kim, et al. (2019), it was also revealed that Korean students' digital literacy among primary and secondary levels have gradually improved overtime, suggesting that it is highly essential to have enough technological knowledge to be competent in this digital age. Also, the knowledge of digital literacy increased significantly post COVID-19 given the need for more online platforms and services to be utilised (Rahim et al., 2024). Being digitally literate not only enables individuals to encounter situations through different perspectives effectively but also to efficiently function in the dynamic digital world.

Furthermore, the role of digital literacy is also imperative to develop a communicatively competent individual. A person who possesses a set of competences essential for effective communication in multicultural surroundings may further develop a person's Intercultural Communicative Competence (ICC). To elaborate, ICC is a term that indicates the ability to establish repertoire with representatives of other cultures through direct communication or during the learning process in achieving mutual understanding (Lysiuchenko, et al., 2021). Studies have explored the significance of digital literacy in the context of intercultural communication in multilingual and multicultural settings (Elboubekri, 2017). Based on a study in Indonesia, it was revealed that learners' intercultural communicative competence increased when a digital literacy project was involved in the learning process (Nur Rakhmawati, 2018). This results

from the understanding of intercultural relationships among students who went through similar experiences in the process of intercultural learning.

In another study, Elboubekri (2017) demonstrated that most students who were exposed to a variety of engaging cultural learning through digital technology in the classroom showed positive outcomes. Another earlier research supported these findings, indicating that the use of digital technology enhanced learners' competencies, making them more aware of their attitudes and promoting an understanding of others' perspectives (Anderson & Corbett, 2012). Additionally, Kamaruddin, Azizul and Roslim (2024) further revealed that utilizing digital technology, such as movies contributed to meaningful and valuable language learning among students from diverse cultural backgrounds. These findings have confirmed that the use of digital tools contributes greatly to enhancing learners' digital literacy skills and intercultural communicative competence, given the right methods of intervention.

The relationship between digital literacy and ICC is framed by Byram's Model of Intercultural Communicative Competence (1997). The model identifies five critical components, namely (1) attitudes of curiosity and openness, (2) knowledge of cultural practices and products, (3) skills of interpreting and relating, (4) skills of discovery and interaction, and (5) critical cultural awareness. This model provides a structured lens for examining how digital literacy tools foster intercultural learning. By integrating Byram's ICC model into the analysis, this study positions digital literacy as both a medium and a catalyst for developing intercultural competence in multilingual classrooms.

The integration of digital literacy and intercultural communication paves the way for deeper investigation into exploring the essential skills and competencies that learners can develop. With the increasing demand of a globalised society, the need to embrace digital literacy and intercultural communication is vital to navigate and thrive in a diverse cultural environment. This research therefore, aimed to explore the perceived impact of digital literacy in enhancing intercultural communicative competence among university students in a multicultural classroom setting. Specifically, this study aims to identify effective digital literacy tools that can be used to enhance intercultural communication and how the use of digital technologies impacts the development of intercultural communicative competence among undergraduate students in a multicultural classroom.

2.1 The Theoretical Framework

This study is grounded in Byram's Model of Intercultural Communicative Competence (1997), which identifies five key components of ICC: (1) attitudes (curiosity and openness), (2) knowledge (of social groups and cultural practices), (3) skills of interpreting and relating, (4) skills of discovery and interaction, and (5) critical cultural awareness. Digital literacy intersects with these components in multiple ways. To illustrate, the digital literacy tools including video conferencing platforms, online forums, social media and online learning platforms, as well as translation and audiovisual tools, mediate and catalyse Byram's Model of Intercultural Communicative Competence (1997) in enhancing *knowledge and attitudes, skills of interpreting and relating, discovery and interaction* alongside *cultural awareness* by exposing learners to diverse perspectives. By using Byram's model, this study positions digital literacy as both a medium and a catalyst for developing ICC. The integration of Byram's model that underpins the study therefore provides a comprehensive perspective to investigate how digital literacy fosters ICC development as perceived by learners. Digital tools are not merely technological enablers but are essential in shaping learners' intercultural attitudes, knowledge, and skills in multicultural educational settings. The following framework depicts how digital literacy tools mediate into every component of Byram's ICC framework, enabling holistic intercultural competence development:

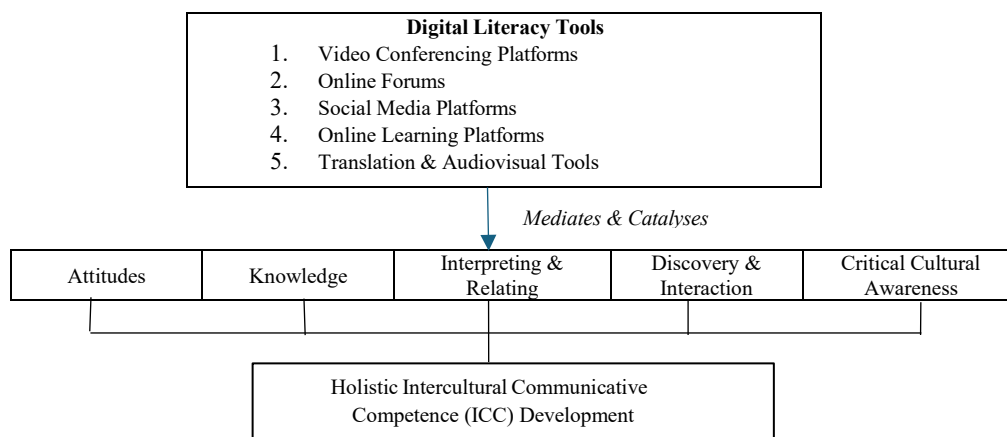


Fig. 1. Framework of the Study

3. METHOD

3.1 Research Design

The research employed a qualitative design to explore how undergraduate students perceive the role of digital literacy in enhancing intercultural communicative competence (ICC). According to Creswell (2007), a qualitative approach was deemed appropriate as it allows for an in-depth understanding of participants' experiences and perceptions of a particular context. This study, therefore, adopted a descriptive design based on the qualitative data gathered through Google Form using open-ended questions. This will enable the researchers to further extend, refine or explain the qualitative findings.

3.2 Participants

The study involved 11 first-year undergraduates students enrolled in Bachelor of Business Management at Universiti Teknologi MARA (UiTM) Sarawak Campus. The sample encompassed students from various ethnic backgrounds, including Malay, Iban, Bidayuh, Melanau, and Orang Ulu, residing in Sarawak, thus reflecting Malaysia's multicultural composition. Their English language proficiency levels ranged from intermediate to advanced.

The participants were recruited through convenience sampling, as students were readily accessible to the researchers, and they willingly agreed to take part in the study. Convenience sampling is commonly used in exploratory qualitative studies for the purpose of gaining insights rather than generalising to a larger population (Etikan, et al., 2016). The participants were considered suitable because UiTM Sarawak provides a natural set-up consisting of multicultural ESL learners that reflects Malaysia's linguistic and cultural diversity. The sample size was intentionally limited to ensure a manageable analysis of the data for thematic analysis and rich descriptions of participants' perspectives.

3.3 Data Collection and Instrument

Data were collected using a Google Form consisting of four open-ended questions. This method allowed participants to provide reflective and detailed written responses at their own pace and convenience. The use of online forms as a medium for qualitative research provides a practical approach as asynchronous written responses can and often yield detailed and meaningful responses (Braun et al., 2021). The open-ended items were designed to prompt participants to describe specific experiences and perceptions of using digital tools for intercultural communication. This method was deemed appropriate to explore participants' perceptions while extending or refining insights drawn from prior literature. To ensure rigor and trustworthiness in the study, participants were briefed on the purpose of the research, and verbal consent was secured from

everyone. Participants were informed that all data collected would remain confidential. The results obtained during the research were neither related to nor included in the students' continuous assessment or final grades. All the data remained anonymous and were stored only until the publication of this study.

3.4 Data Analysis

The qualitative data were analysed using the thematic analysis method, following the six-phase framework including familiarisation, coding, generating, reviewing, and defining themes, and finally producing the report (Braun & Clarke, 2006). This method provides a comprehensive understanding of the role of digital literacy in promoting effective intercultural communication among undergraduate students and offers insights for educators on how to leverage digital tools to enhance students' ICC. Themes were then interpreted in light of Byram's ICC model (1997), categorising them into attitudes, knowledge, skills of interpreting/relating, skills of discovery/interaction, and critical cultural awareness. This helped to provide a theoretically informed understanding of the findings.

4. FINDING & DISCUSSION

4.1 Digital Literacy Tools in Intercultural Communication

The data was qualitatively analysed using thematic analysis to identify the most effective digital literacy tools that can be used to enhance intercultural communication. The students' feedback regarding effective digital tools was organised in tabular form, and from this analysis, various themes emerged. These themes shed light on how students view the effectiveness of digital literacy tools in building intercultural connections. Based on the themes, the findings revealed that Communication tools were viewed as the most effective digital literacy tool to be used in communicating and understanding individuals from other cultures. The respondents believed that this tool further assisted them in empowering their Intercultural Communicative Competence (ICC), especially in a multicultural context. Table 1 indicates the list of effective digital literacy tools according to students' order of preference.

Table 1. Digital Literacy Tools in Intercultural Communication

Themes	Sub-themes	Preference
Communication tools	Virtual meetings / Video Conferencing (Eg: Zoom, Facebook Messenger, Microsoft Teams)	Most preferred
	Instant messaging / text chat Email	
Social media tools	Social media (Eg: YouTube, Facebook, Twitter, Instagram)	
Online learning	Online courses (Eg: MOOC), Online learning with speaker from another culture	
Search engines and browsing	Blogs Internet browsers	Least preferred
Dictionaries and lexicons	Bilingual dictionaries Target language encyclopedias	
Audio-visual tools	Films/videos with original subtitles Films/videos with English subtitles Podcasts	
Translation tools	Translation softwawres (Eg: Google Translate) Pronunciation tutorial videos	
Task-based tools	Online games	

Table 1 describes the preferred digital literacy tools in intercultural communication. Based on the responses given by the participants, the four most preferred digital literacy tools include Communication tools, Social media tools, Online learning tools and Search engines. Among the four digital literacy tools, Communication tools are perceived as the most preferred method for cultivating ICC among undergraduate students. Communication tools include platforms such as Zoom, Facebook Messenger, Microsoft Teams

or Google Meet, Instant messaging or text chat platforms and email. Students explained that such tools allowed them to engage in real-time interaction, bridging cultural differences by enabling them to both see and hear peers from different backgrounds. From the open-ended question, one participant noted:

*"I think video conferencing is the most effective digital tool in enhancing intercultural communication because it allows people to see and hear each other in real-time, which can help to **bridge cultural differences and create a more personal connection.**"* – R02

To this, another participant added:

*"Virtual Meetings, because Virtual meetings through video conferencing eliminate the need for physical travel, making it **easier for people from diverse cultural backgrounds to connect and collaborate,** even if they are geographically dispersed."* – R05

From these responses, it was revealed that students were aware of the effectiveness of Communication tools as a means to enhance Intercultural Communication. According to Lan and Habók (2022), the use of digital tools such as social media tools, search engines and online learning platforms among others, enables students to leverage knowledge and comprehension in communicating with other cultures. These tools further aid in understanding and embracing cultural differences to build more connections and collaboration among students of various backgrounds. This resonates with the findings of Elboubekri (2017), where students showcased positive outcomes when it comes to using technology in a multicultural classroom to communicate.

From the perspective of Byram's Model, these tools foster *skills of interaction* and *attitudes of openness*, as students learn to adapt communication styles while engaging with diverse peers. Social media platforms (e.g., Facebook, YouTube, Instagram) emerged as the second most frequently mentioned tools. They provided informal spaces for students to observe, engage with, and learn about cultural norms and practices. In this sense, social media contributed to *knowledge of cultural practices* and *critical cultural awareness* by exposing learners to multiple viewpoints. Other tools included online learning platforms (e.g., MOOCs, blogs), which students valued for structured intercultural exchanges, and search engines, which supported information-seeking and interpretation across cultural contexts. Audio-visual materials and translation tools were less preferred but still noted as helpful for interpreting meaning and understanding linguistic nuances.

4.2 Impact of digital technologies on the development of intercultural communicative competence (ICC)

The results from the study generally revealed that respondents positively embraced the significance of digital literacy tools, particularly in empowering Intercultural Communicative Competence (ICC). From the open-ended question, respondents were asked if digital technology has helped them in understanding students from other cultural backgrounds. Students reported that digital literacy tools not only facilitated communication but also encouraged empathy and appreciation of diversity. For example, group projects conducted via video conferencing and online forums were described as opportunities to share perspectives and co-construct knowledge. One respondent provided a comprehensive example of how the digital tools have impacted the development of ICC:

*"I think digital tools have helped me in understanding other students from different cultural backgrounds by **providing a platform for cross-cultural interactions and exchanges.** For example, when I was working on a group project with students from different countries, we used video conferencing to discuss our ideas and perspectives. This allowed us to learn from each other's unique cultural backgrounds and experiences, which helped us **to create a more diverse and inclusive project.**"* – R07

Interestingly, another participant also shed light on the impact of digital tools on ICC:

*"I have participated in online forums and discussion boards where I have been able to engage in conversations with students from different cultures about various topics. These conversations have helped me to **gain a better understanding of different cultural perspectives and to appreciate the diversity of experiences that exist in our world.**" – R10*

Based on the respondents' remarks, it clearly supported the previous findings which stated the importance of Communication tools as an impactful platform. Video conferencing platforms including online forums and discussion boards are significant to students' development in the process of enhancing intercultural communicative competence. It contributed to positive outcomes for students which benefited them in understanding and communicating effectively to gain new perspectives in a culturally diverse environment. In relation to Byram's Model (1997), it illustrates how digital tools cultivate *skills of discovery and interaction* as learners engage in intercultural dialogues that expand their worldview. Another respondent further described that online discussion forums help to encourage deeper cultural understanding:

*"Many educational institutions use online discussion forums or platforms to facilitate asynchronous conversations. These platforms allow students from diverse backgrounds to discuss various topics, share perspectives, and learn from each other's viewpoints. This **encourages empathy and cross-cultural understanding.**" – R08*

From this, the students' responses further highlight the importance of digital literacy tools in empowering students' intercultural communicative competence. These findings align with Elboubekri (2017) and Nur Rakhmawati (2018), who argued that digital platforms enhance intercultural learning and that digital projects improve ICC among learners. They also highlight the relevance of fostering digital literacy in higher education to strengthen learners' intercultural competencies. Additionally, key phrases such as "understanding cultural perspectives", "encourages empathy", and "cross-cultural understanding" further create a platform for effective intercultural dialogue to take place. This supports the ability to establish repertoire with representatives of other cultures through direct communication or during the learning process in achieving mutual understanding (Lysiuchenko, et al., 2021). The results reinforce previous research (Lan & Habók, 2022; Kamaruddin et al., 2024) by demonstrating that digital literacy to develop collaborative skills. Importantly, the Malaysian ESL context provides evidence of how digital tools operate in multicultural classrooms. Through the implementation of digital literacy tools, intercultural communicative competence can be enhanced and has proven to be effective in a culturally diverse and educational environment.

To provide further analysis, the findings were presented systematically according to Byram's (1997) ICC dimensions. By doing this, it helps to demonstrate how different digital literacy tools contributed to developing each component of intercultural communicative competence among ESL learners.

4.2.1 Attitudes (Curiosity and Openness)

The analysis revealed that students frequently highlighted the role of social media platforms (e.g., Instagram, YouTube, Facebook) in fostering curiosity about other cultures. By following peers from diverse backgrounds, they were exposed to cultural practices, values, and lifestyles beyond their own which further shape their attitude to be curious and open-minded. One participant explained:

"Through Instagram and YouTube, I could see how people from other countries celebrate events and live daily life. It made me more interested to learn about their culture." – R02

This finding reflects Byram's component of attitudes, particularly openness and willingness to engage with cultural difference. Digital platforms encourage learners to suspend judgment and develop curiosity. This resonates similarly to the findings of Nur Rakhmawati (2018), where digital projects encouraged students to embrace diversity and broaden their intercultural horizons.

4.2.2 Knowledge (Cultural Practices and Norms)

From the data, students also reported gaining knowledge through online learning platforms, blogs, and search engines. These tools provided structured content and opportunities to learn about cultural values and perspectives. For instance, one student remarked:

“When I took part in an online MOOC, the lecturer came from another culture, and it gave me a better understanding of how people in other countries think and behave.” – R01

Based on the response, it demonstrates how digital platforms act as knowledge resources, providing students with access to cultural norms and practices. By increasing awareness of cultural systems, learners develop the knowledge required for intercultural engagement. This resonates with Kim et al. (2019), who observed that digital literacy enhances learners’ cultural knowledge and readiness for global interaction.

4.2.3 Interpreting and Relating

Under this domain, audiovisual tools (films, subtitled videos, podcasts) and translation applications were noted as useful in helping students interpret cultural meanings and relate them to their own contexts. One participant shared:

“Watching movies with subtitles helped me to understand humour and cultural references that I wouldn’t normally get. I could compare them with my own culture.” – R11

Such practices embody Byram’s skills of interpreting and relating, where learners draw connections between cultural references and their personal experiences. This aligns with Anderson and Corbett (2012), who argue that exposure to authentic cultural materials deepens learners’ interpretive skills. These findings suggest that digital tools help students to engage in effective intercultural communication.

4.2.4 Skills of Discovery and Interaction

Communication tools such as Zoom, Microsoft Teams, and instant messaging were consistently described as the most effective for intercultural engagement. Students valued real-time communication, which allowed them to adapt and negotiate meaning with peers from diverse backgrounds. One respondent explained:

“Virtual meetings eliminate the need for travel, making it easier to connect with people from different cultures. I learned how to adjust my way of speaking to make sure everyone understood.” – R04

This illustrates Byram’s skills of discovery and interaction, as learners actively explore new perspectives and adjust their strategies. The immediacy of video conferencing also allows learners to observe non-verbal cues (tone, gestures, expressions), which leads to building understanding and rapport among learners. This supports Elboubekri’s (2017) findings that digital tools enable authentic intercultural dialogue to happen in a multicultural context.

4.2.5 Critical Cultural Awareness

Students also emphasised the role of online discussion forums in promoting critical reflection on cultural perspectives. Through asynchronous exchanges, they evaluated not only others’ perspectives but also their own assumptions. As one participant noted:

“When I joined online discussions, I could see different opinions. It made me reflect on my own culture and why we do certain things.” – R09

This reflects Byram's critical cultural awareness, where learners critically evaluate practices, values, and beliefs within their own and others' cultural contexts. By engaging in reflective online dialogue, students develop empathy and a deeper awareness of cultural diversity. These findings are consistent with Kamaruddin et al. (2024), who highlighted that critical reflection through digital platforms enhances intercultural learning outcomes.

By mapping the themes onto Byram's ICC framework, this study showcased how digital literacy supports a holistic development of intercultural competence. Different categories of digital tools were found to foster distinct ICC dimensions: social media enhanced attitudes and curiosity; online learning expanded knowledge; audiovisual and translation tools aided interpreting and relating; communication platforms promoted skills of discovery and interaction; and online forums cultivated critical cultural awareness. Together, these findings confirm that digital literacy is a vital enabler of ICC in multicultural ESL classrooms.

5. CONCLUSION

This study investigated the perceived impact of digital literacy on intercultural communicative competence (ICC) among Malaysia ESL learners. By exploring the attitudes of undergraduate students towards digital literacy, identifying effective digital tools that can enhance ICC, and analysing the impact of using digital tools on ICC development, this study revealed the significance of Communication tools as effective means to leverage intercultural communication. Anchored in Byram's ICC framework, the study revealed that digital literacy supports not only the acquisition of knowledge and skills but also the development of openness, empathy, and critical cultural awareness. The crucial role of digital literacy in promoting effective intercultural communication among ESL learners was found to be essential, especially in cross-cultural interactions. Students these days showed preference for synchronous learning, by incorporating the usage of multiple platforms at the same time, thus supporting the need to be digitally literate in the 21st century (Atikah, et al., 2022). This further enhances the role of technology on students, leading to the potential benefits of self-regulated learning in a technology-assisted learning environment (Halim et al., 2024).

Moreover, the findings of this study have important implications for educators to promote intercultural communication skills among students in higher education. By identifying effective digital practices and tools, educators can implement them into their syllabus to provide students with opportunities to develop their ICC skills in an online environment. In this case, educators hold the responsibility to deliver meaningful scaffolding experiences by strategising their approaches to enable students to engage in deep learning (Sim Phek Lin, et al., 2023). This will benefit learners of the target language to perform effectively in broadening their communicative competencies. However, it is also important to note that the findings in this study are only limited to the samples used in this research and thus cannot be generalised to the whole population.

The findings of this study hope to provide valuable insights into how digital literacy can be integrated into the undergraduate curriculum to enhance intercultural communicative competence. Additionally, the results may also provide valuable insights into the use of digital literacy practices in language learning and intercultural communication. This will eventually empower the development of intercultural communicative competence among undergraduate students in multicultural and multilingual classroom settings. The significance of this research lies in its potential to contribute to the development of effective strategies and approaches for teaching digital literacy skills to university students, which can ultimately improve their intercultural communication skills.

Future research can consider increasing the sample size to gain more conclusive results. Also, future studies can investigate other potential factors or challenges that may contribute to learners' digital literacy and development of ICC in the language classroom. In general, the outcome of the study suggests that digital literacy tools are key factors that significantly contribute to cultivating learners' cultural tolerance, enhancing communication skills and facilitating knowledge exchange. This will also contribute to the

existing literature on digital literacy and ICC to provide practical insights for educators to implement digital tools and technologies in empowering intercultural communication skills in a multicultural classroom.

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CONFLICT OF INTEREST STATEMENT

The authors confirm that the article is the result of the researchers' own efforts and has not been previously published or is currently being reviewed for publication elsewhere. The authors affirm that all authors have made substantial contributions to the material submitted to the GADING Journal for the Social Sciences.

AUTHORS' CONTRIBUTIONS

Jacqueline Susan led the research execution and manuscript preparation. Kimberley Lau conceptualised the study and provided the theoretical foundation. Tang Howe Eng designed the methodology and supervised research progress. Christine Jacqueline analysed the data and contributed to the discussion. Imelia Laura proofread, finalised, and approved the manuscript for submission.

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