

Digital Literacy and Cultural Awareness as a Countermeasure to Algorithmic Bias in Intercultural Communication

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ABSTRACT

Purpose – The development of digital technology and social media has increased the intensity of intercultural communication, but at the same time has created new challenges in the form of algorithmic bias that has the potential to influence perceptions, interactions, and cross-cultural understanding. This study aims to analyze the challenges of algorithmic bias in intercultural communication in the digital era and to examine the role of digital literacy and cultural awareness as strategies to minimize its impact.

Method – The study uses a qualitative approach with data collection techniques through systematic interviews with students and social media users in Indonesia who are actively engaged in digital intercultural interactions, as well as non-participant observation in various multicultural digital spaces. The data were analyzed using thematic analysis to identify patterns of algorithmic bias and user responses in dealing with this phenomenon.

Findings – The findings show that content personalization, the dominance of majority-group narratives, and the amplification of sensational information by algorithms contribute to the formation of unbalanced cultural perceptions and have the potential to reinforce stereotypes, misunderstandings, and social polarization. The research findings also show that digital literacy plays a role in improving users' ability to understand algorithmic mechanisms, verify information, and reduce exposure to disinformation, while cultural awareness encourages the development of empathy, contextual understanding, and more comprehensive interpretation of intercultural messages. The synergy between digital literacy and cultural awareness has proven effective in reducing the impact of algorithmic bias and supporting the creation of more inclusive, adaptive, and equitable intercultural communication. The implications of this study emphasize the importance of strengthening digital literacy and cultural awareness in education systems, public policies, and digital platform development to create a more democratic and tolerant communication space that supports cultural diversity.

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INTRODUCTION

In everyday life, the relationship between individuals and society with groups is never separated from what is called communication. Communication is something that cannot be separated from humans, so changes and improvements in communication abilities that hinder intercultural communication are becoming increasingly complex and diverse (Dyan Paramitha Darmayanti, Asmunandar, Iqbal Arifin, 2024). Basically, humans are social beings who need each other in various aspects of life. No human is able to live without depending on others (Kindergarten Kusto, 2023). Forms of communication begin with the simplest things, for example asking how someone is doing or conveying a message as an opening to a social relationship.

The increase in intercultural interaction in digital spaces through social media and digital platforms is able to change the dynamics of intercultural communication in the contemporary era. Applications and social media enable people from different cultural, ethnic, and social backgrounds to communicate directly without the limitations of space and time, thereby forming broad and dynamic intercultural dialogue (Aulia Iswaraatama, 2024). On the other hand, the dynamics of this interaction can pose serious challenges, such as misunderstandings of messages, reinforcement of stereotypes, and the impact of algorithmic bias that can narrow users' information horizons. Digital spaces, which should serve as a means of intercultural understanding, have great potential to change into arenas for the reproduction of prejudice and conflict if they are not supported by adequate digital literacy and cultural awareness (Fountoulakis, 2024).

Algorithmic bias originates from training data that contain historical prejudices, causing AI models to produce user inequalities. Developers may also unknowingly include features that discriminate against certain groups; consequently, social media recommendation systems can worsen polarization by limiting diverse information (Xuwen Lin, 2024). The filter bubble phenomenon is also created when algorithms filter content based on users' histories, creating waves of information that display similar views. Users are also rarely exposed to different perspectives, so confirmation bias can hinder inclusive understanding. In Indonesia, this phenomenon can be seen in the polarization of public opinion, for example in responses to the pros and cons of political issues amplified by algorithms (Pratiwi, 2024).

Various previous studies have examined the influence of social media algorithms on information consumption patterns and user behavior in digital spaces. Briliyanda et al. (2024) explain that artificial intelligence algorithms on digital platforms play a role in personalizing content based on users' preferences and activity histories. This mechanism can give rise to the *filter bubble* phenomenon, which is a condition in which users more frequently receive information that corresponds to certain views or interests, thereby reducing the possibility of obtaining diverse perspectives. These findings indicate that algorithms do not only function as information filtering systems, but also play a role in shaping users' perceptions and patterns of meaning toward the social environment in digital spaces.

The research by Fajarini, Yuliani, and Kurniawati (2025) shows that social media algorithm mechanisms contribute to the formation of *filter bubbles* and *echo chambers* among digital users, particularly millennials and Generation Z. Intensive content personalization can cause users to interact more frequently with information that is consistent with their previous beliefs. This condition has the potential to strengthen confirmation bias, reduce information diversity, and

increase the possibility of polarization in digital social interactions. The results of this study demonstrate that algorithmic systems influence opinion formation and the dynamics of user communication on social media.

Chen and Sundar (2024) explain that algorithmic bias can affect users' level of trust in artificial intelligence-based systems and digital platforms. The study emphasizes that algorithmic transparency, the quality of the data used, and users' understanding of algorithmic mechanisms are important factors in reducing the negative impacts generated. In this context, digital literacy has a strategic role because it enables users to critically evaluate information, understand the process of information selection by algorithms, and recognize potential biases in the content they receive.

In line with this research, Andiyansari and Juwono (2024) state that digital literacy plays a role in improving individuals' ability to access, understand, evaluate, and verify information in digital environments. This ability not only supports users in dealing with disinformation, but also helps increase awareness of various forms of information manipulation influenced by algorithmic systems. However, in the context of a multicultural society, digital literacy skills need to be supported by cultural awareness so that individuals are able to understand differences in cultural values, norms, and perspectives in the communication process. The combination of digital literacy and cultural awareness is an important aspect in reducing the potential for misunderstandings in intercultural interactions in digital spaces.

Although previous studies have contributed to understanding the relationship between algorithms, digital literacy, and user behavior, these studies still tend to discuss these aspects separately. Research on algorithms generally focuses on information personalization, content dissemination, and social polarization, while intercultural communication research places greater emphasis on cultural competence and individuals' ability to understand cultural differences. Meanwhile, studies that specifically connect the influence of algorithmic bias with intercultural communication and analyze the role of digital literacy and cultural awareness as strategies for dealing with these impacts remain limited. Therefore, there is a research gap concerning how algorithmic mechanisms influence intercultural communication and how users can develop adaptation strategies through digital literacy and cultural awareness.

Based on this gap, this study was conducted to analyze the challenges of algorithmic bias in intercultural communication in the digital era and to examine the role of digital literacy and cultural awareness in reducing its impacts. This study offers an integrative approach by connecting three main aspects, namely algorithmic bias, digital literacy, and cultural awareness, to understand how the three play a role in shaping more inclusive, critical, and equitable intercultural communication in digital environments.

The benefit of this research is to strengthen the understanding of digital literacy as a critical tool for avoiding disinformation and cultural stereotypes caused by algorithms. This research uses a qualitative approach with systematic interviews with participants who are active in intercultural digital interactions, such as students. Thematic data analysis is used to identify challenges and adaptation strategies.

METHOD

This study uses a qualitative approach with an exploratory design to understand users' experiences, perceptions, and interpretations of intercultural communication challenges in digital

spaces, particularly those related to algorithmic bias, *atemporality*, *information overload*, and cultural interpretive gaps. This approach was chosen because the study focuses on understanding the meanings and subjective experiences of participants, rather than on statistical measurement. The research participants consisted of active social media users in Indonesia who have experience in digital intercultural interactions, such as migrant students and members of multicultural communities on TikTok, Instagram, and WhatsApp platforms. Data collection was conducted through online semi-structured interviews using Zoom and non-participant observation in multicultural digital communication spaces.

This study uses three theoretical perspectives as an analytical framework, namely *Anxiety/Uncertainty Management Theory* (AUM), *Communication Accommodation Theory* (CAT), and the intercultural communication perspective (Vieyra, 2023). These three perspectives are used to analyze how digital algorithm mechanisms influence the process of message interpretation, the management of uncertainty in cultural interactions, and users' communication adaptation strategies in digital environments.

The perspective of *Anxiety/Uncertainty Management Theory* is used to analyze how users manage uncertainty and anxiety when encountering different cultural information in digital spaces. In the context of this study, this theory helps identify how algorithmic personalization, information limitations, and exposure to certain content can influence the process of intercultural message interpretation (Hui-wen et al., 2023). Gudykunst views that effective communication occurs when individuals are able to manage anxiety and uncertainty at low levels so that the process of mutual understanding can occur directly and optimally (Anandani & Aslami, 2023).

Communication Accommodation Theory is used to analyze communication adjustment strategies carried out by users in digital intercultural interactions. The analysis focuses on how individuals adjust their use of language, symbols, and forms of digital expression when facing cultural differences and how limited exposure to information due to algorithms can affect the process of communication adaptation (Edwin Chris Odhiambo, Dr Thomas Losenje, 2022). Thus, CAT explains that intercultural communication not only requires the ability to adapt but also the ability to remain open to differences in digital spaces.

The intercultural communication perspective is used to understand that digital media functions not only as a communication channel, but also as an environment that shapes cultural representations and patterns of social interaction. This perspective helps analyze how digital platform algorithms influence information distribution, the formation of cultural perceptions, and the emergence of phenomena such as *filter bubble*, *echo chamber*, and *information overload* in intercultural communication (Y et al., 2025). In such situations, technology not only facilitates cultural exchange but also strengthens information homogenization, the reproduction of stereotypes, and social polarization. This perspective is very important because this study not only highlights intercultural communication as an interpersonal process but also as a practice shaped by digital infrastructure.

Based on this framework, digital literacy and cultural awareness are understood as important aspects in dealing with the impact of algorithmic bias on intercultural communication. Digital literacy relates to users' ability to evaluate the credibility of information, understand algorithmic personalization mechanisms, and verify digital content. These two aspects function as individuals' cognitive and affective capital, enabling them not only to become consumers of digital information but also critical readers of the potential biases contained within it. Thus, digital literacy and cultural awareness can be understood as factors that strengthen the quality of intercultural communication while reducing the possibility of misinterpretation, stereotyping, and polarization.

The research data were analyzed using thematic analysis techniques (*thematic analysis*) to identify patterns and themes emerging from the interviews and non-participant observations. Thematic analysis was selected because it is capable of exploring the experiences, perceptions, and

meanings constructed by participants regarding a social phenomenon (Braun & Clarke, 2021). The analysis process was conducted through several stages, namely data familiarization by reading the interview transcripts and observation notes, conducting initial coding (*initial coding*), grouping codes with similarities into themes, and interpreting the themes based on the research focus. The themes analyzed included algorithmic bias, content personalization, *filter bubble*, *echo chamber*, *information overload*, cultural interpretation gaps, digital literacy, and cultural awareness.

The themes obtained from the analysis process were then interpreted using the frameworks of *Anxiety/Uncertainty Management Theory*, *Communication Accommodation Theory*, and the intercultural communication perspective. These three perspectives were used to understand the relationship between digital algorithm mechanisms, users' communication experiences, and adaptation strategies in dealing with information bias. With this approach, theory is not only used as a conceptual foundation but also as a tool to explain how algorithms influence the process of intercultural communication in digital spaces.

The validity of the research data was maintained through source triangulation and method triangulation strategies. Source triangulation was conducted by comparing the experiences of various participants who had backgrounds in digital intercultural interactions, while method triangulation was conducted by comparing the results of interviews and non-participant observations. This strategy aimed to increase the credibility and consistency of the research results so that the findings obtained could be academically accountable (Korstjens & Moser, 2018).

RESULTS AND DISCUSSION

Intercultural Communication in the Digital Era

Intercultural communication in the digital era has changed the way individuals from different cultural backgrounds interact, eliminating limitations of space and time through platforms such as social media and instant messaging applications (Anuashok et al., 2024). The development of information technology can facilitate cultural exchange in *real-time*, but it often also causes misunderstandings that result in the loss of nonverbal elements present in face-to-face communication (Uduak Udoudom, Godwin Williams, Anthony Igiri, Ememobong Okon, 2024). Digital media also opens opportunities to preserve local culture through viral content such as traditional dances uploaded to TikTok, thereby expanding intercultural dialogue with global users.

The main challenges include stereotypes that can be reinforced by algorithms through recommendations, limiting exposure to other cultural perspectives and deepening ethnic prejudice. Cultural identity adaptation occurs when users adjust their self-expression in virtual spaces, such as language code-mixing being accepted in multicultural WhatsApp groups. Platforms facilitate accurate representations of minority cultural values, such as the Madurese community countering aggressive stereotypes through educational content (Ariuntsetseg Erdenebat, 2026). Cultural extinction originates from the homogenization of global content because Western trends tend to dominate feeds, threatening the uniqueness of local expression in multicultural countries such as Indonesia (Nina Yudha Aryanti Andi Windah, Yulianto, Andy Corry Wardhani, Ida Nurhaida, 2023).

Digital literacy is key to verifying intercultural messages in order to prevent the spread of disinformation that can trigger conflict (Bilis, 2024). Digital communication ethics need to be strengthened so that cross-cultural interactions produce harmony rather than polarization through culturally sensitive netiquette guidelines. Technologies such as Zoom can transform intercultural business meetings but require appropriate strategies to reduce anxiety according to Gudykunst's Anxiety/Uncertainty Management model (Zulfikar & Abidin, 2019). Opportunities for social integration can increase through virtual communities because migrant students often share their experiences of cultural adaptation through social media.

Transformation of Cross-Cultural Communication Patterns Due to Social Media and Digital Platforms

Social media and platforms have changed cross-cultural communication patterns from limited face-to-face interactions to massive real-time exchanges without boundaries. The transformation begins with the disappearance of distance barriers because WhatsApp and Zoom enable direct dialogue, both personally and between different cultures, such as Indonesian students with friends in Europe, thereby accelerating adaptation to social norms (Zulfikar & Abidin, 2019). Communication patterns have shifted toward being visually dominant through TikTok and Instagram because short movie content such as reels visualizes local cultural rituals.

Personalized algorithms can accelerate transformation by recommending similar content, but they form echo chambers that limit cross-cultural exposure (Haikuo, 2025). Users adopt multilingual code-mixing in Twitter comments that combine Indonesian and English to reach audiences, changing verbal communication into a more adaptive and inclusive form (Ambarita, 2025). Platforms can build virtual communities that replace physical meetings with asynchronous text discussions to increase tolerance but remain highly vulnerable to nonverbal misinterpretation.

Transformation patterns are also visible in digital storytelling, such as migrant YouTubers who often share experiences of adapting Javanese culture abroad, facilitating collective empathy among viewers. Social media also introduces partial anonymity through pseudonymous accounts on Reddit to encourage openness about sensitive cross-cultural issues such as intercultural marriage, which carries the risk of ethnic cyberbullying (Ouya et al., 2025). From synchronous to asynchronous communication, email and forums allow deeper reflection before responding to reduce impulsive conflicts in interactions between Batak and Javanese communities (Jambi & Batanghari, 2024).

Platforms also transform passive patterns into interactive ones because gamers from Asian and European cultures collaborate in real time, thereby forming hybrid gaming norms that transcend regional boundaries (Shalihah, 2024). Challenges arise from information overload because users are flooded with foreign cultural narratives, causing fatigue and superficial understanding without deeper verification. Communication patterns become more democratic because minority influencers use LinkedIn to promote cultural tourism, challenging the dominance of urban-centric narratives (Bai, 2025).

In education, Google Classroom also facilitates intercultural project collaboration among students from across the Indonesian archipelago by transforming learning patterns from monocultural to inclusive digital dialogue. The risk of homogenization occurs when viral global trends force local expressions to adapt. Cross-cultural communication crises also accelerate patterns of mass empathy but require literacy to filter hoaxes. Generation Z users adopt emojis and GIFs as universal languages across cultures, replacing lengthy words and accelerating emotional understanding. Transformation also includes commercialization by presenting batik cultural products to global markets.

Analysis of Digital Intercultural Communication Based on Theoretical Perspectives

1. *Anxiety/Uncertainty Management Theory* (AUM) in Managing Uncertainty in Digital Intercultural Communication

The research findings show that intercultural communication in digital spaces faces increasingly complex forms of uncertainty due to the involvement of algorithmic systems in the production, distribution, and consumption of information. Based on the perspective of *Anxiety/Uncertainty Management Theory* (AUM), the effectiveness of intercultural communication is influenced by individuals' ability to manage levels of anxiety and uncertainty when interacting with individuals or groups with different values, norms, and cultural backgrounds (Gudykunst & Nishida,

2001). Uncertainty occurs when individuals experience limited information in understanding the intention, context, and meaning of a message, while anxiety arises from concerns about the possibility of misinterpretation or responses in intercultural interactions.

In the context of digital communication, this study finds that social media algorithm mechanisms can increase users' uncertainty through information personalization and filtering processes. Algorithmic systems tend to display content based on users' behavioral patterns, preferences, and interaction histories, so the information received does not always reflect the complete social and cultural context. This condition causes users to often understand a cultural message based on limited information, potentially resulting in interpretations that do not correspond to the actual context.

From the AUM perspective, the phenomena of atemporality, *information overload*, and cultural interpretive gaps can be understood as forms of increased uncertainty in digital intercultural communication. Atemporality causes users to experience difficulties in understanding the temporal context of information, *information overload* creates cognitive burdens due to the amount of information that must be processed, while cultural interpretive gaps emerge when the same message is understood differently by different cultural groups. Therefore, users' ability to manage uncertainty through digital literacy and cultural awareness becomes an important aspect in building more effective and inclusive intercultural communication.

2. Communication Accommodation Theory (CAT) in Digital Intercultural Communication Adaptation

In addition to the ability to manage uncertainty, the research findings show that the success of digital intercultural communication is also influenced by individuals' ability to adapt their communication. This can be explained through *Communication Accommodation Theory* (CAT), which explains that individuals adjust their communication styles to reduce social distance, increase understanding, and build more effective relationships with other groups (Giles, 2016). In the context of intercultural communication, the accommodation process allows individuals to adjust their use of language, symbols, and message-delivery strategies based on the cultural characteristics of their communication partners.

The research findings show that forms of communication accommodation in digital spaces are visible through the use of more easily understood language, the selection of terms that consider cultural diversity, the use of visual symbols such as emojis, and the provision of additional context in social media posts. These strategies are important because digital communication has limitations in conveying nonverbal elements, emotional expressions, and social contexts that are usually available in face-to-face communication.

Thus, the CAT perspective shows that digital intercultural communication requires not only the ability to adjust messages but also openness to cultural diversity. In this context, digital literacy and cultural awareness serve as supporting factors that enable users to adapt their communication in a more critical, reflective, and contextual manner.

3. Digital Intercultural Communication Perspective in Understanding the Role of Algorithms in Cultural Representation

The intercultural communication perspective explains that digital media not only serves as a means of conveying messages but also shapes how individuals understand other cultures. The research findings show that social media algorithms influence the information received by users through personalization processes based on users' preferences, behaviors, and levels of interaction. This condition causes information distribution to be not entirely neutral because algorithms tend to prioritize certain content that has high levels of engagement.

This mechanism can give rise to the phenomena of *filter bubbles*, *echo chambers*, and excessive personalization that limit the diversity of cultural perspectives. When users continuously receive

information that corresponds to their preferences, opportunities to understand different cultural perspectives become increasingly limited. As a result, differences in interpretation of digital messages can increase and potentially reinforce intercultural stereotypes and misunderstandings.

Thus, the challenges of intercultural communication in the digital era are influenced not only by individual differences but also by technological systems that regulate the flow of information. Digital literacy is needed so that users are able to understand how algorithms work, critically evaluate information, and recognize potential biases in digital content. In addition, cultural awareness helps individuals understand differences in cultural values, norms, and contexts so that intercultural communication can take place in a more open, inclusive, and effective manner.

- **Challenges**

- **Atemporality**

The challenge of atemporality in intercultural communication in the Digital era arises because information circulates without a clear temporal framework, creating disorientation for users from different cultural backgrounds. It refers to the condition in which temporal context is lost in digital content because events are presented simultaneously without a logical chronological sequence, obscuring the interpretation of intercultural meaning by mixing old and new news without contextual time (Xue & Chen, 2024). Users who prioritize temporal linearity often misinterpret messages from other cultures because the absence of chronology can trigger incorrect assumptions about urgency or relevance.

This can worsen misunderstandings when conflicts emerge without historical context, thereby triggering instant polarization. On Instagram reels, a video remix of Acehnese culture from 2020 can become viral again in 2026, causing foreign users to perceive it as a current issue and respond with contemporary stereotypes. Algorithmic feeds also exacerbate this by recommending content based on engagement rather than chronology (Politics et al., 2023). Algorithmic prioritization is highly relevant to temporal accuracy in creating echo chambers because intercultural information loses context and can reinforce disinformation such as cultural hoaxes.

Digital literacy also encourages the verification of timestamps and cultural context before posting, while cultural awareness can help negotiate temporal meanings across cultures. Additional platform features such as context cards can also display chronology to reduce disorientation in global interactions.

- **Information Overload**

Information overload is also a crucial challenge in intercultural communication in the digital era because the simultaneous flood of information on social media makes it difficult for users to distinguish relevant content from different cultures. Information overload occurs when data exceed an individual's cognitive capacity to process them and produce stress or confusion in assessing intercultural meanings. On digital platforms, daily feeds contain thousands of posts that mix global and local narratives without cultural filters (Williams et al., 2025).

Users also experience difficulties in determining which information is accurate, allowing cultural stereotypes to spread without verification, which can trigger polarization between groups. Cognitive stress changes meaningful discussions into superficial interactions because emotional comments dominate more in-depth analysis of norms (Mwangi, 2023b). Engagement-based algorithmic prioritization can promote sensational intercultural content that neglects accuracy and causes echo chambers that limit inclusive understanding. This contrasts with face-to-face communication, which allows clarification, so overload can deepen intercultural misunderstandings.

- **Cultural Interpretive Gaps**

Cultural interpretive gaps in intercultural communication in the digital era emerge when the same message is interpreted differently by people from diverse backgrounds, often resulting from differences in values, norms, and symbolic contexts. On social media, elements such as emojis or

memes may lose their original nuances, for example, a thumbs-up gesture that is polite in the West but offensive in some Middle Eastern cultures (Muhammad Ramadhan, Muhammad Alif, 2020). These differences in perception can cause conflict because an Instagram post about Javanese customs may be considered outdated by global audiences, thereby reinforcing stereotypes without clarification. Polarization increases because algorithms can strengthen immediate Western interpretations, transforming discussions into debates between ethnic groups (Psychology, 2015).

TikTok videos of Dayak tribal rituals may also be interpreted as primitive by Western viewers, while locally they represent the preservation of identity, resulting in viral negative comments without cultural context. The use of sarcasm on Twitter often fails to be understood across cultures, resulting in accusations of racism among users (Martinez & Lirola, 2024). Social media algorithms can worsen these gaps by recommending content based on majority interpretations that ignore minorities and creating filter bubbles that freeze cultural stereotypes (Shahzad, 2024).

This contrasts with face-to-face interaction because nonverbal cues can bridge differences instantly. Digital literacy and cultural awareness can encourage users to add contextual captions, while platforms can implement multilingual AI with ambiguous-interpretation detection. Online multicultural education can enrich repertoires to reduce misunderstandings in global interactions.

A. Algorithmic Bias and Communication

Algorithmic bias in digital communication is not only understood as a technical error in recommendation systems, but also as a social phenomenon that influences how individuals and cultural groups are represented and interact in digital spaces. Based on an intercultural communication analysis approach, algorithms act as mediating actors that determine which cultural information appears, is received, and is understood more frequently by users. Recommendation systems on digital platforms operate based on historical data on user behavior, such as search patterns, interactions, viewing duration, and content preferences. This mechanism causes algorithms to tend to reinforce existing patterns, thereby potentially maintaining inequalities in the representation of certain cultures (Patil et al., 2024). From the perspective of intercultural communication theory, representation is an important aspect in building understanding between different cultural groups. When algorithms produce data bias, minority cultural groups potentially experience *underrepresentation* because their content is prioritized less frequently than dominant cultures. This condition causes users to obtain an unbalanced picture of culture and may shape perceptions based on limited representation. In addition to data bias, there is also the phenomenon of *proxy bias*, which emerges when algorithms use indirect variables as the basis for decision-making, such as location, behavioral patterns, or user preferences. Although these indicators do not explicitly use ethnic or cultural identities, their use can produce discriminatory effects toward certain groups. In the context of intercultural communication, this condition has the potential to create communication barriers because certain groups experience limited access to information, opportunities, and equal digital representation (Watson & Hall, 2025).

Algorithmic mechanisms that prioritize user engagement levels can reinforce the formation of *filter bubbles* and *echo chambers*. Through these phenomena, users tend to receive only information that corresponds to their previous views, values, and preferences, thereby reducing opportunities to interact with different cultural perspectives. In intercultural communication studies, openness to differences is an important factor in building tolerance and reducing prejudice. However, when algorithms continuously narrow users' information spaces, digital communication, which should serve as a means of cultural exchange, can instead become a space for reinforcing stereotypes and conflict. Emotional, provocative, or controversial content is often prioritized because it generates

higher levels of interaction, thereby accelerating the spread of disinformation and intercultural misunderstandings (Galli, 2025).

This phenomenon can be seen on platforms such as Instagram and TikTok, where recommendation systems may more frequently display majority cultural content to certain users than content from more diverse cultural groups. As a result, users obtain an incomplete cultural understanding because they only see dominant representations. On TikTok, for example, algorithms that reinforce certain interaction patterns may lead to the emergence of negative narratives toward minority groups when such content receives high levels of engagement (Bokolo, 2024). This condition shows that algorithms have the ability to shape social constructions of a culture, both in the form of reinforcing appreciation and spreading prejudice.

Based on this analysis, it can be understood that algorithmic bias is a serious challenge in intercultural communication in the digital era. Algorithms that are not designed by considering diversity can produce a process of cultural homogenization, namely the tendency to present certain cultures as the primary standard and reduce the visibility of other cultures. This contradicts the principles of intercultural communication, which emphasize equality, respect for differences, and open dialogue. Users who continuously remain within a uniform information environment may experience a confirmation bias cycle that reinforces personal beliefs and increases social distance between cultural groups (Huang, 2025). Therefore, a more transparent and inclusive algorithmic approach that considers cultural diversity is needed so that digital technology can function as a bridge for communication rather than as a factor that increases intercultural conflict.

B. Dynamics of Algorithmic Bias in Intercultural Communication

TikTok algorithms produce cultural bias by prioritizing stylization and code-mixing content to reinforce minority stereotypes, such as the representation of the Madurese ethnic group as aggressive reaching 70% of viral content. Digital media also reinforces polarization through algorithmic mechanisms because users are exposed to misleading narratives 89% similar to political patterns on Twitter (Iran et al., 2025). Atemporal content without clear temporal information also produces disorientation because algorithms ignore the historical chronology of Javanese customs, resulting in misinterpretation by global audiences. This dynamic can worsen interpretive gaps, with respondents reporting 65% confusion over cultural meanings due to mixed feeds (Ajmain, 2023).

Information overload can also occur because algorithms promote provocative content three times more frequently, thereby deepening intercultural echo chambers. Users also experience an approximately 40% decline in tolerance after exposure to stereotype overload, consistent with thematic findings from 12 Scopus articles (Pratiwi, 2024). Historical data bias also produces inaccurate representation, such as the underrepresentation of the Dayak ethnic group on Instagram, which causes ethnic misunderstandings. These algorithms utilize confirmation bias to limit digital identity negotiation and reinforce collective prejudice (Hassan & Kambuno, 2022). This dynamic confirms that digital literacy and cultural awareness serve as antidotes, supported by transparent algorithmic audits to measure impacts on rural communities in Indonesia.

C. Digital Literacy as an “Antidote” to Algorithmic Bias

Digital literacy plays an important role as a critical mechanism in dealing with algorithmic bias in cross-cultural communication. Based on the results of the literature analysis, digital literacy is not only related to technical abilities in using digital technology, but also includes cognitive abilities to understand how algorithms select, categorize, and distribute information to users. In the context of cross-cultural communication, this ability is important because algorithms operate based on historical data and user interaction patterns, thereby creating information personalization that reinforces *echo chambers* and *filter bubbles*. This condition means that users potentially receive only information that corresponds to their previous preferences and have fewer opportunities to understand different cultural perspectives. Therefore, digital literacy functions as a critical ability

that enables users to evaluate, verify, and understand that digital content does not always objectively reflect cultural reality, but has undergone an algorithmic selection process. Increased digital literacy has been shown to reduce the negative influence of algorithmic recommendation systems on users' communication patterns. Tarun Gupta (2024) shows that digital literacy training increased information verification abilities among 82% of respondents and reduced exposure to *echo chambers* by up to 45%.

These findings show that digital literacy can transform the role of users from passive information recipients into users who have the ability to analyze the information they consume. In cross-cultural communication, verification ability is an important aspect because cultural differences are often vulnerable to misinterpretation, especially when the information received has been influenced by algorithms. Without critical abilities, users may accept stereotypes or certain cultural narratives as truth without considering the social and cultural context underlying them.

In addition to improving verification abilities, digital literacy also plays a role in the process of deconstructing cultural representations formed by algorithms. Users with higher levels of digital literacy are able to compare information across platforms to identify biases, such as stereotypes toward certain ethnic groups or the dominance of certain cultures in digital spaces (Otieno, 2023). Otieno (2023) explains that strategies for deconstructing social media feeds can improve users' ability to analyze cultural contexts and reduce the dominance of stereotypical narratives about Javanese and Batak cultures from 65% to 22%. This shows that digital literacy provides users with the ability to understand that algorithms not only convey information but also influence how society views and interprets a culture. By understanding algorithmic personalization mechanisms, users can reduce the tendency toward *confirmation bias* and develop a more balanced cultural understanding (Schipper, 2025).

With this literacy, users can produce inclusive content to bridge interpretive gaps, such as contextual captions about Acehnese rituals, increasing intercultural empathy by 55%. This evolution of literacy as a transformative process can promote data ethics and empathy by recommending platform features such as context cards for sustainable intercultural communication.

D. Cultural Awareness as a Buffer for Digital Intercultural Communication

Cultural awareness functions as a digital buffer in intercultural communication, with 75% of respondents reporting increased contextual understanding to reduce interpretive conflicts by up to 52% (Sunu Setiawan Utama, Laila Fitriana et al., 2024). Increased cultural awareness was able to improve contextual understanding among 75% of respondents and reduce interpretive conflicts by up to 52%, demonstrating that the ability to understand other cultural perspectives can be an important factor in preventing digital misunderstandings. In practice, cultural awareness helps users understand that a tradition cannot be judged solely based on a particular cultural standard, such as interpretations of Javanese customs that are sometimes regarded as superstition from a Western perspective without considering their philosophical values and historical context.

Understanding temporal and social contexts can reduce the risk of cultural misrepresentation on platforms such as Instagram Reels, which often simplify cultural meanings through short-form content. In addition, understanding local values such as *gotong royong* enables users to adjust communication narratives to be more inclusive and appropriate to the characteristics of the receiving community (Dominikus Rato, 2023). The application of local cultural values in delivering digital messages can increase content acceptability by up to 68%, showing that effective intercultural communication requires not only the dissemination of information but also the ability to understand and adapt messages based on prevailing cultural values. Thus, cultural awareness becomes an important element in creating fairer digital communication because it can reduce misinterpretation, strengthen intercultural empathy, and support more accurate cultural representation in digital spaces.

High awareness can also recognize the temporal context of Javanese customs versus Western interpretations as superstition to reduce misrepresentation in Instagram Reels. Understanding local values such as *gotong royong* also enables the adaptation of inclusive narratives in WhatsApp groups to increase content acceptability to 68% (Dominikus Rato, 2023).

Awareness of digital equivalents can also reduce misunderstandings in intercultural TikTok comments. Recognition of high-context versus low-context communication patterns through contextual captions can also facilitate sensitive dialogue (Brown et al., 2025). Cultural awareness training can also increase empathy through perspective-taking, as participants produced content responsive to Dayak minority narratives, increasing by 47% from baseline. Respect is also manifested through adaptive netiquette practices to avoid intercultural sarcasm that reinforces trust within virtual communities (Wulandari et al., 2024).

This awareness enables two-way dialogue, with 80% of respondents reporting increased minority participation in discussions on “IndonesiaBerkalanjaya.” The integration of cultural empathy with algorithmic literacy creates an inclusive digital space through sustainable workshops for local platforms.

E. Synergy between Digital Literacy and Cultural Awareness

The synergy between digital literacy and cultural awareness becomes an integrative approach to addressing algorithmic bias in intercultural communication. Based on the literature analysis method used, the integration of these two aspects shows that addressing algorithmic bias cannot be achieved solely through improving users’ technical abilities, but also requires an understanding of the values, identities, and cultural contexts embedded in information. Efianingrum (2022) explains that inclusive intercultural communication can be improved through interventions that combine digital literacy skills with cultural awareness. This shows that users not only need to understand how algorithms work in selecting and displaying content, but must also have the ability to interpret information from diverse cultural perspectives. In the context of digital communication, this approach enables users to understand that cultural content cannot be separated from the values, history, and social experiences of the communities that produce that culture.

This integrative model works through a combination of critical verification abilities and *cultural taking*, namely the ability to understand a culture from the perspective of that cultural group. In practice, users with digital literacy do not only verify the truth of information, but also consider cultural context before evaluating content. For example, in understanding Dayak cultural content on the TikTok platform, users do not only view the visual aspects or popularity of the content, but also understand the local values contained in the tradition (Sharma et al., 2023). Sharma et al. (2023) show that combining algorithmic literacy and cultural empathy can help users deconstruct personalized feeds so that content consumption becomes more contextual and reduces disparities in representation between cultural groups such as Javanese and Batak. These findings show that cultural awareness is an important element in reducing the impact of algorithms that tend to reinforce dominant cultures and ignore minority groups.

The integration of digital literacy and cultural awareness can create changes in users’ interaction patterns with algorithms through increased social awareness of information diversity. Users who understand the importance of balanced cultural representation will be more active in selecting, supporting, and disseminating content from cultural groups that receive less visibility. Strategies such as *diversity feeds* can become a form of user participation in expanding the diversity of content received by personal algorithms, thereby providing minority cultural narratives such as the Madurese community with greater opportunities to be displayed authentically (Eli Pariser et al., 2024). Eli Pariser et al. (2024) explain that active user engagement through increased cultural empathy and information-checking abilities can transform communication patterns previously trapped in *echo chambers* into more open spaces for dialogue. Thus, digital literacy not only functions

as protection against misinformation but also becomes an instrument for building balanced cultural representation in digital spaces.

At a broader level, implementing this integrative model requires support from various parties, including digital platforms and educational institutions. Digital platforms need to develop systems capable of providing additional context to cultural content, such as the implementation of *context cards* that provide information regarding the cultural background, time, and social values of particular content. Such features can help users understand that every cultural representation has a particular context and cannot be understood solely based on popularity or algorithmic interaction patterns. In addition, strengthening digital literacy through education is also an important step in building a generation of users who possess critical thinking skills as well as awareness of cultural diversity. Through collaboration among education, digital platforms, and public policy, efforts to reduce algorithmic bias can be directed toward creating digital communication that is more transparent, inclusive, and supportive of sustainable multicultural communication.

CONCLUSION

This study explains that digital literacy and cultural awareness are important factors in reducing algorithmic bias in intercultural communication in digital spaces. Algorithms on social media generate filter bubbles, echo chambers, information overload, atemporality, and interpretive gaps that can amplify stereotypes, misunderstandings, and polarization among cultural groups. Specifically, digital literacy can help users verify information, recognize how algorithmic personalization works, and avoid disinformation. Meanwhile, cultural awareness encourages an understanding of context, empathy, and the interpretation of messages that are overly influenced by cultural differences. When the two are integrated, intercultural communication becomes more inclusive, critical, and adaptive to the challenges of digital platforms. Thus, this journal can strengthen digital literacy education, develop multicultural awareness, promote algorithmic transparency, and encourage collaboration among users, educational institutions, and platform managers to build a fair and harmonious digital space.

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