Exploring Tertiary Students' Comprehension and Utilisation of the Emoji in Social Media Communication: Insights from a University in Ghana

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This study investigates how university students in Ghana utilise and understand emojis on the messaging platform WhatsApp. Emojis act as a visual shorthand in digital communication. However, ambiguity exists around emoji meanings, creating risks of misinterpretation. A survey of 300 students in a Ghanaian University examined emoji usage frequency, interpretation and perceived effects on interaction. Findings revealed frequent emoji use for expressing emotions and social bonding. But students did not consistently interpret emojis identically. Despite this, most students believed emojis enhanced interactions.

The discrepancies in emoji comprehension indicate potential communication risks. This study's findings highlight the need for greater emoji literacy to support university students' critical comprehension and principled usage. It also recommends the integration of emoji literacy skills into digital citizenship initiatives within educational institutions to foster judicious usage habits.

Keywords: Emoji, Emoticon, Social media, WhatsApp, University Students, Communication

The ubiquity of social media and messaging apps has transformed communication practices, especially among young people. Platforms like WhatsApp enable instant, multi-modal messaging integrating text, visuals, audio and video. Their interactive, participatory nature supports constant connectivity between users. However, these affordances also create challenges around misunderstandings and misinterpretations. Emojis' common symbolic meaning facilitates communication across diverse cultures and languages (Danesi, 2016). But ambiguity around emoji interpretations remains an issue. As Tigwell and Flatla (2016) found, people perceive emojis differently. Mismatches between sender intent and receiver understanding of emojis contribute to miscommunication. This links to media ecology

theory's examination of how communication technologies shape social meanings and cultures (McLuhan, 2010). Emojis represent a new visual language emerging from digital media, with implications for common understanding.

This study examines Ghanaian tertiary students' usage and interpretation of emojis on WhatsApp. University students constitute prime users of WhatsApp, heavily utilising emojis to communicate, express ideas and manage impressions (Al Rashdi, 2018). Prior research shows students actively use emojis to express emotions, enhance interactions and convey non-verbal cues in digital messaging (Rodrigues et al., 2018; Bai et al., 2019; Barbieri et al., 2016; Lebduska, 2014). But do students interpret emojis uniformly? Effective communication requires shared understanding between encoder and decoder. Several studies reveal users often misunderstand emojis, applying subjective meanings shaped by individual, social and cultural contexts (Niemelä-Nyrhinen, & Seppänen, 2020; Miller et al., 2016). Misunderstanding emoji meanings could undermine the relational and emotional communication purposes students aim to achieve through emojis. The pervasive uptake of messaging apps like WhatsApp among young people reflects broader shifts in communication technologies.

Previously, universities contacted students via noticeboards and posts, lacking interactivity. Now social media enables instant, multi-way communication between institutions and students, supporting feedback and engagement (Ariel & Avidar, 2015). For students, social media facilitates social bonding, information exchange, self-expression, coordination and collaboration with peers. WhatsApp's fusion of messaging, visuals and hyperlinks in a mobile interface provides constant connectivity for young people to participate in online social networks for multiple purposes, from socialising to learning. However, the reliance on written text and emoji to mediate communication online also poses risks. Misinterpretation of tone, intent and semantics increases compared to in-person conversations with vocal and physical cues.

Despite their popularity, emojis may thus foster miscommunication if meanings are unclear. Their use to express emotions also risks replacing development of verbal literacy. Yet research into emoji comprehension among university students is limited, especially in African contexts. This study therefore addresses gaps in understanding emoji usage and literacy among Ghanaian tertiary students. Surveying students provides insights into how

embedding of emojis in messaging may outpaces critical comprehension, highlighting risks of misunderstanding. It investigates emoji usage frequency and purposes, decoding skills and interpretation differences, and its implications for communication.

LITERATURE REVIEW

As social creatures, humans rely on communication for survival and connection. Verbal and nonverbal cues are used daily to convey meaning and emotion. With the invention of communication technologies like the telephone, computer and internet, remote communication has rapidly expanded. Smartphones are now the most ubiquitous communication technology, enabling instant messaging, social media and visual sharing globally. As technologies advance, communication can occur without face-to-face interaction. However, the rise of digital communication has also created challenges in conveying tone, emotion and nuance solely via text. Emojis have emerged as an extremely popular way to enhance digital communication. Originating in Japan in the 1990s, emoji use spread globally through mobile messaging and social media apps (Miller et al., 2016). Unicode standardisation has allowed emojis to be integrated across languages and platforms. However, ambiguities around emoji meaning can also lead to misinterpretation and misunderstanding. This literature review synthesises current research on emoji utilisation and comprehension in digital communication. Gaps in knowledge are highlighted regarding emoji use specifically within Ghanaian cultural contexts and by tertiary students.

Understanding of emojis

Some scholars argue that nonverbal cues in communication convey emotional expressions, while signals indicate personal attitude. Emojis can provide these missing layers in digital messages. By adding tone, emotion and nuance, emojis may enhance communicative abilities in the digital era. However, some associate emojis with unprofessionalism, and meanings can be unclear (Tigwell & Flatla, 2016). Emojis assist expression of feeling but can also create ambiguity leading to inefficient communication (Bich-Carriere, 2019). Users may interpret the same emoji differently based on cultural exposure, technical variations in emoji displays, and individual visual perception (Miller

et al., 2016). For example, some view 🙏 as "prayer" while others see "clapping hands." This can hamper mutual understanding and communication efficacy. Studies reveal individual variance in interpreting emojis. Berengueres and Castro (2017) found up to 26% divergence in people's emotional responses to negative emojis. Misunderstandings also increase when emojis are viewed across different platforms (Miller et al., 2016). By introducing multiple potential interpretations, ambiguous emojis can disrupt communication flow and damage interpersonal connections (Boutet et al., 2021; Tigwell & Flatla, 2016). Effective utilisation requires aligning emojis with the overall message.

Use of emojis and frequency of use

Emojis originated as a way to convey nonverbal cues like facial expressions, emotions and activities in digital messages (Alshenqeeti, 2020). First popularised in Japan, emoji use grew globally through Apple's iPhone and social media platforms like WhatsApp (Miller et al., 2016). As a visual language, emojis enable social media communication across language barriers. Studies reveal widespread adoption, with emoji used in over 50% of Instagram posts and 5 billion sent daily on Facebook (Bai et al., 2019). Beyond enhancing meaning and emotion, emoji provide tools for relationship management, social etiquette and tone communication in digital conversations (Riordan, 2017; Gantiva et'al., 2019). Research suggests emojis improve communication quality by adding nonverbal richness, allowing more accurate interpretation of intent and feeling (Hsieh & Tseng, 2017). As digital channels become predominant for interacting with contacts, emojis have emerged as an important evolution enabling expression in digital writing (Mcculloch, 2019). However, evidence indicates many WhatsApp users misunderstand and misuse emojis. Examining Ghanaian students' specific comprehension and use of WhatsApp emojis can reveal insights into this population's digital communication practices and abilities.

Statistics confirm the exponential growth in emoji usage across digital communication channels. There are now over 3000 emoji recognised by Unicode (Bai et al., 2019). Emojis appear in approximately 50% of Instagram posts and are used 5 billion times daily on Facebook. Research suggests emojis are diversifying communication opportunities by enabling more creative, expressive digital language (Danesi, 2016). Over 85% of Facebook users employ emojis in public posts (Oleszkiewicz et al., 2017). Within

mobile messaging apps like WhatsApp, emoji use has also become highly prevalent (Sampietro, 2020; Negishi, 2014). As visual cues, emojis fulfil the demand for nonverbal signals in digital communication to accurately convey meaning and emotion.

Widespread Internet and mobile device access has enabled constant social media engagement in many societies. Social media interactions can be mechanical (user-interface) or social (user-user) (Hoffman & Novak, 1996). Social connections motivate most social media use, including seeking information, advice, relationships and sense of community (Kim et al., 2011). Social interactions on platforms like WhatsApp can be categorised as vertical or horizontal interactivity. Vertical interactivity describes users interacting with close ties like family and friends. WhatsApp is primarily used for vertical sociality, connecting users to their existing intimates (Salehan et al., 2017; Stefanone et al., 2011). Horizontal interactivity on the other hand refers to users expanding networks by building new connections around shared interests or goals. Social media enables both vertical bonding with intimates and horizontal bridging to new contacts (Huang et al., 2018).

Phatic communication

Phatic communication describes social exchanges focused on relational bonding over informational content (Malinowski, 1922). These ritualistic social interactions using casual speech reinforce relationships through a sense of communality. Phatic communication is becoming more visible through widespread use of visual social media like Snapchat (Niemelä-Nyrhinen & Seppänen, 2020). Rather than conveying ideas, phatic language affirms social ties. Smartphone messaging frequently serves phatic purposes, with conversations prioritising social connection over information exchange (Sun, 2000). Though often dismissed as meaningless, phatic communication fulfils critical social functions like relationship building and affirming group identity (Burnard, 2003). Researchers now widely apply "phatic" to describe current visual social media use involving casual photo sharing (Niemelä-Nyrhinen & Seppänen, 2020). Enabled by smartphones and ubiquitous internet, everyday vernacular photography has been transformed into a social activity centered on maintaining connections (Lobinger, 2016). On platforms like Facebook and Snapchat, users share glimpses of life with friends and wider audiences, prioritising social bonding over informational content (John, 2012).

WhatsApp allows intimate circles to engage in similar phatic photo sharing. Investigating whether Ghanaian students' WhatsApp image exchanges are predominantly phatic could reveal how social ties are maintained digitally.

Emojis as phatic communication

Malinowski's theory of phatic communion suggests words themselves, regardless of meaning, serve a social function. Similarly, emojis' primary purpose may be social rather than informational. The Oxford Dictionary naming an emoji its 2015 Word of the Year signalled their integration into language. Danesi (2016) outlines how emojis are used phatically in instant messaging to initiate and conclude interactions, avoid textual silence, and set social tone. Beyond their explicit meanings, the act of exchanging emojis itself constitutes phatic communication building social capital (Aull, 2020). For example, a smiling emoji affirms bonds with the recipient when used phatically. WhatsApp exchanges using emojis for social connection rather than information illustrate this phatic capacity. As visual cues, emojis provide nonverbal social signals similar to those in face-to-face conversations, elucidating tone and affirming communal bonds (Vandergriff, 2013; Danesi, 2016). The deictic nature of emojis also resembles spoken phatic expressions. Overall, emojis now appear to play an important phatic role in digital communication, especially among young people in higher education. Investigating whether Ghanaian students utilise WhatsApp emojis predominantly for social signalling versus informational content can reveal the phatic nature of their digital sociality. Their ability to accurately comprehend emojis' phatic functions would also indicate degrees of digital communicative skill.

This literature review has summarised key research on emojis, highlighting their rising popularity alongside issues of ambiguity and misuse. Gaps exist regarding emoji use specifically by Ghanaian younger population in their dominant digital communication channels like WhatsApp. Examining this demographic's emoji comprehension and practices can provide greater insight into the phatic nature of their digital social exchanges, with implications for improving digital communication abilities.

Theorising media interactivity in social media communication

Interactivity is widely acknowledged as an important component of communication processes on social media platforms, as well as a relational maintenance technique that contributes to relational outcomes (Ariel & Avidar, 2015). In the context of social media

communication, emojis play a crucial role in enhancing interactivity by providing visual cues that complement text-based messages. This is particularly relevant for tertiary students in Ghana, who increasingly rely on social media platforms for both academic and social interactions.

Common definitions of interactivity include control, speed, participation, range of options, directionality, hypertext, connectivity, experience, and responsiveness (Rafaeli & Ariel, 2009). Interactivity has tended to be defined from three different research perspectives: (a) interactivity as a perception-related variable, focusing on participants' experiences and self-reports; (b) interactivity as a process-related variable, focusing on the ways participants exchange information; and (c) interactivity as a medium characteristic, focusing on the technological features of a medium and its ability to enable interaction (Sundar, 2004; Rust and Varki, 1996 and Markus, 1987). In the context of emoji use, these perspectives on interactivity can be applied in several ways. From a perception-related standpoint, we can examine how Ghanaian tertiary students perceive the interactivity of conversations enhanced with emojis. This approach focuses on the students' subjective experiences and interpretations of emoji-enriched communications. From a process-related perspective, we can explore how emojis facilitate information exchange and emotional expression in social media interactions among students. This view emphasises the role of emojis in shaping the communication process itself. Lastly, considering interactivity as a medium characteristic allows us to investigate how different social media platforms used by Ghanaian students integrate and display emojis as interactive features. This approach highlights the technological aspects of emoji use and how they contribute to the interactive capabilities of various digital platforms.

Other studies examining interactivity as a perception-related variable have investigated links between an individual user's psychological and social characteristics and their perception of a medium's degree of interactivity (Sohn & Lee, 2006). This approach could be extended to examine how Ghanaian students' cultural backgrounds and personal experiences influence their perception of emoji use in social media interactions. Rafaeli (1988) proposed a model of interactivity that differentiates noninteractive, reactive and fully interactive messages.

In Rafaeli's model, there are three different forms of messages in communication processes: one-way messages between a sender and receiver(s) constitute declarative communication. Two-way directional messages where the receiver can also send and receive messages back comprise responsive (reactive) communication, but the messages are limited to the information requested. The third form, fully interactive communication, involves a two-way flow of messages between sender and recipient, with each message referring not just to the most recent turn but also earlier ones, facilitating interpersonal communication (Ariel & Avidar, 2015). To develop a comprehensive understanding, researchers have examined a range of variables and models of interactivity, encompassing user experience, technological features and context (Gleason & Lane, 2009). In the case of emoji use among Ghanaian tertiary students, this could involve examining how cultural context, technological accessibility, and individual user experiences shape the ways in which emojis are used and interpreted in social media communication.

A slight shift in perspective can completely change one's understanding of interactivity and its role in communication processes. Interactivity has traditionally been conceptualised in the literature by linking it to the presence of a technological feature, a user's perception, or a combination of the two. In each case, interactivity is characterised as something that drives the communication process from the inside out (Gleason & Lane, 2009). Interaction and interactivity are both derived from interaction, referring to a communication process marked by mutual or reciprocal actions, influence, or exchange of messages. While interaction denotes the act or process of interacting itself, the related terms interactive and interactivity each describe something distinct. Although often used interchangeably, their roles and the elements they describe in communication differ significantly. Interactive refers to technological channel features or content elements that enable an active communication transaction where these components act on or with other technologies and features to obtain data or commands and provide immediate feedback or updated information.

Interactivity, on the other hand, is a simplistic view of how much a user (the interactant) participates (interacts) in a communication process (interaction) with a technology's substantive interactive features. In the context of emoji use, interactivity could be viewed as the degree to which Ghanaian students engage with and utilise emojis

to enhance their social media communications. Interactivity is a highly complex and subjective term far from being the concrete absolute it is often portrayed as in communication literature (Gleason & Lane, 2009). As Lee (2000) states, "what matters is the interaction among the variables, not the objectively measured interactivity". In her view, interactivity is ultimately a perceptual variable. Other writers (McMillan, 2002; Stromer-Galley, 2000) also acknowledge that users' perceptions of interactivity vary. To establish interactivity as a perceptual variable, the user must actively perceive its presence, which Wu (2005) describes as "psychological sensations experienced by site-visitors." Laurel (1986) identifies the feeling of interactivity, or the user's sense of "participating in the representation's ongoing action," as one of the defining elements of interactivity. It is each user's (receiver's) actions or involvement that triggers the perception of interactivity.

More recent interactivity research has built on this view of interactivity as a perceptual variable dependent on user psychology and the context of interaction. For example, Song and Zinkhan (2008) found that users' perceived level of interactivity varied depending on website features and individual differences in need for cognition, web browsing style and web expertise. Other studies have shown interactivity perceptions are shaped by user motivation, ability and opportunity to process information and personality traits like extroversion. In the context of emoji use among Ghanaian tertiary students, these findings suggest that factors such as cultural background, digital literacy, and individual personality traits may influence how students perceive and engage with emojis in their social media communications. While existing research provides a solid foundation for understanding interactivity in social media communication, there is a notable gap in studies specifically addressing emoji use among Ghanaian tertiary students. This research aims to fill this gap by exploring how interactivity theories can be applied to understand the comprehension and utilisation of emojis in this specific cultural and educational context.

Media ecology in social media communication

Media ecology refers to the study of media environments, the idea that technology and techniques, modes of information and codes of communication play a leading role in human affairs. McLuhan used the terms technology and media interchangeably, referring

to print as "the technology of individualism," before going on to discuss "media fallout" (McLuhan, 1962). Media ecology provides a useful framework for understanding how new forms of communication, including emojis, shape human interaction and perception in digital environments.

To understand McLuhan's philosophy of media ecology, it is important to recognise that media are technologies, and technologies are media. McLuhan considered all technologies and tools as media. A key premise was that media impacts societal development, with key eras and advances characterised by the rise of a dominant medium during that time. Ecology refers to the environment in which the medium is used, encompassing what the medium is and how it shapes the environment. As Postman (2006) stated, "If a medium in biology is something in which a bacterial culture grows (as in a Petri dish), in media ecology, the medium is a technology within which a (human) culture thrives." Media ecology examines how communication media shape human perception, understanding, feeling and value; and how our interaction with media helps or hinders our chances of survival. Ecology refers to the study of environments, including their structure, content and effect on people. After all, an environment is a complex message system that imposes certain patterns of thinking, feeling and behavior on humans (McLuhan, 1962). Media ecology posits that media serve as extensions of human senses in each era, with communication technology as the main driver of social change. McLuhan is best known for coining the phrase "the medium is the message," meaning the medium used to convey a message is as, if not more, important than the message content itself.

Today's mainstream internet platforms are now all referred to as "social media," encompassing social networking sites like Facebook, Twitter, WhatsApp and YouTube. Social media is commonly recognised as an inherent part of Web 2.0 (Kaplan & Haenlein, 2010), a term coined by O'Reilly (2007) to describe the emergence of new platforms, features and uses relying on user-generated content, decentralisation and rich user experience. In Ghana, social media platforms like WhatsApp, Facebook, and Twitter have gained significant popularity, especially among young adults and university students (Tetteh & Kankam, 2024; Biney & Kumi-Asamoah, 2023). These platforms have become integral to how Ghanaian tertiary students communicate and express themselves. However, some media scholars argue that framing these platforms as part of a Web 2.0

revolution obscures their continuity with longer-term trends of increasing commercialisation and centralised control within internet cultures (Lesage & Natale, 2019; Fuchs, 2016). Fuchs (2016) suggests Web 2.0 motifs of participation and user empowerment provides ideological cover for technology corporations to exploit user data and attention, utilise free user-generated content, and consolidate oligopolistic positions.

Emojis, as a form of visual communication within social media, represent a unique aspect of the current media ecology. These small digital images or icons used to express emotions, ideas, or objects have become a global phenomenon, transcending language barriers. In the context of Ghanaian tertiary education, emojis offer students a way to enhance their digital communication, adding nuance and emotional context to text-based messages. The interpretation and use of emojis can vary significantly across cultures (Danesi, 2016; Chandra Guntuku et al., 2019; Park et al., 2021). In Ghana, where traditional forms of non-verbal communication play a crucial role in daily interactions, the adoption and adaptation of emojis by university students present an interesting area of study. Understanding how Ghanaian students comprehend and utilise emojis can provide insights into the interplay between global digital communication trends and local cultural norms.

According to Fuchs (2016), platforms like Facebook and YouTube exhibit contradictory qualities that reflect tensions between user community and hierarchy, democracy and control, participation and surveillance. Their participatory architecture and discourse of sharing, openness and collaboration contrasts with proprietary technology, algorithmic power over visibility, and extraction of user data for advertising. Media ecologists characterise social media platforms as attention economies that compete for scarce user time and data. Attention becomes a commodity traded by users in exchange for connectivity and access to networks (Kubler, 2023; Crogan & Kinsley, 2012). For tertiary education institutions, the use of emojis in student-to-student and student-to-faculty communication via social media platforms raises questions about academic discourse, formality, and the evolution of language in digital spaces. Exploring how Ghanaian university students navigate these boundaries can offer valuable insights into the changing nature of academic communication in the digital age.

Other media ecology perspectives highlight how social media reshape concepts of space, time and boundaries between public and private. Meyrowitz (1985) argued electronic media merge formerly distinct physical settings, social situations and hierarchies, bringing dispersed social worlds into new overlapping configurations. In similar context, other scholars argued that social media is blurring the boundaries, allowing remote, absent others into proximal, present encounters (Mols, & Pridmore, 2021; Leppäkumpu & Sivunen, 2021). New temporalities also emerge, as social media enable constant connectivity, real-time updating and archiving of past moments for future review (Jacobson, 2022; Coleman, 2020; Lohmeier et al., 2020).

Overall, media ecology reveals how new communication technologies interact with and shift personal psyches and social relations in complex ways. Ong (2012) characterised media as exteriorised technologies that restructure consciousness. The ecology of social media suggest that its platforms promise connection, but can also foster isolation; they increase visibility, but can facilitate harassment; they promote transparency, yet enable misinformation. Their ecological impacts remain contradictory and open-ended. While media ecology provides a broad framework for understanding digital communication, there is a lack of specific research on emoji use among Ghanaian tertiary students. This study aims to fill this gap by exploring how students at a Ghanaian university comprehend and utilise emojis in their social media communication, contributing to our understanding of media ecology in a specific cultural and educational context.

METHODS

This research adopts a descriptive research design to investigate the comprehension and utilisation of emojis by Ghanaian tertiary students in their social media communications at the University. As Saunders et al. (2009) outline, descriptive research aims to provide an accurate profile of people, events or situations from the perspective of individuals, organisations or industries. Situating this study within this framework enabled the research to develop a detailed understanding of how students comprehend and use emojis based on their perspectives and experiences. The study population comprised undergraduate students of various faculties and schools of the two campuses of the University for Development Studies (UDS). A convenience sampling technique was

employed, where participants were selected based on their ease of availability, accessibility, use of WhatsApp and willingness to participate (Dörnyei, 2007; Saunders et al., 2009). This non-probability sampling method requires that subjects are available and consent to take part, without any further sampling criteria (Saunders et al., 2009).

This research collected primary data over a period of 45 days *(spanning from 13th October to 28th November 2022)*, directly from 300 undergraduate students with the relevant experience of using emojis in WhatsApp communications to explore their comprehension and usage patterns, through self-administered questionnaires containing a mix of closed and open-ended questions. Closed questions were used to elicit quantitative data on aspects such as students' information sources, communication channels, frequency of emoji use and perceptions of effects on interactions. Open-ended questions gathered qualitative insights through illustrative quotes and clarification of students' understanding and expectations when using emojis. Quantitative data was analysed using SPSS statistical software. Descriptive statistics, including numbers, tables and graphs, are used to summarise and present the results. For qualitative data, thematic analysis is utilised to scrutinise and code responses to identify key themes and patterns (Braun & Clarke, 2006). This enabled dominant trends in emoji comprehension and use to be determined.

The methodology links to the overall research topic on exploring tertiary students' comprehension and use of emojis in several ways. Firstly, the descriptive research design enables an in-depth profile of this phenomena to be developed from the perspectives and experiences of students as the primary participants (Saunders et al., 2009). Secondly, convenience sampling provides access to a relevant cross-section of tertiary students who actively use emojis in social media communications for exploration (Dörnyei, 2007). Thirdly, the mixed methods approach through questionnaires generates both quantitative insights into emoji usage patterns as well as qualitative perspectives on comprehension and expectations. Finally, the data analysis techniques facilitate summarisation of emoji usage trends and elucidation of students' understanding.

The sample provides diversity across faculty/schools and gender to gain varied insights, as emoji usage may differ across these groups. The 300 sample size provides a sufficient sample for descriptive statistical analysis of quantitative results. The

combination of quantitative and qualitative data facilitates a comprehensive understanding of both emoji usage patterns as well as user perspectives on meaning and motivation.

RESULTS

The results revealed social media, especially WhatsApp, is the predominant platform students use to communicate and obtain information on campus. Over 70% of respondents revealed that they get campus information via social media platforms, while 83% reveal that they communicate with friends through social media messaging apps. WhatsApp was the most widely used platform, with 85% of students utilising it frequently. This aligns with recent studies showing the ubiquity of WhatsApp among young people and students for communication and information exchange (Al Rashdi, 2018; Amry, 2014).

Emojis appear deeply embedded in students' WhatsApp interactions. It is found to be very popular among Ghanaian tertiary students who use WhatsApp messaging platform as 69% of respondents who engage in WhatsApp conversations reported always using emojis. The results show that 42% of respondents' primary expectation of emoji usage during WhatsApp conversations is to convey emotions with profound impact on the receiver. Other reasons cited for the frequent emoji usage during conversations was to make messages shorter and more appealing. Overall, 83% of respondents believe emojis have a positive effect on their WhatsApp interactions with peers and met their communicative expectations. However, while frequently using emojis, comprehension of most emojis used in conversation was found to be limited. Only 40% of respondents were found to understand the meaning of emojis used during their own conversations. The remaining 60% were uncertain, indicating a high risk of misinterpreting emojis and by implication, the communicative action.

To analyse emoji comprehension among respondents in this study, 14 commonly used emojis were presented to students who stated what they perceived the meaning to be.

Table 1: List of Emoji used to test respondents' comprehension

Emojis	Unicode Classified Intended Meaning	Emojis	Unicode Classified Intended Meaning
😍	In love	😳	Flushed Face. Surprise or confusion
🤣	Rolling on the Floor Laughing (Laughing loud)	😜	Face With Stuck-Out Tongue and Winking Eye. (Teasing)
😊	Smiling Face	😏	Smirking face. (Indifference)
🙏	Person With Folded Hands. High five	😡	Pouting Face (Anger or Annoyance)
😭	Loudly Crying Face	💃	Dancing Woman (Excitement or Celebration)
😘	Face Throwing a Kiss with love	😒	Unamused Face (Annoyance or Distress)
👍	Thumbs-Up	👏	Clapping Hands

Source (Extracted from Unicode Emoji List, 2022)

Results from this experiment showed wide variation in interpretation. Emojis perceived accurately by the majority of respondents were crying 😭 (88%), smiling 😊 (75%), kissing 😘 (90%), clapping 👏 (67%), dancing 💃 (62%) and angry 😡 (92%). Their visual representations clearly reflect the implied meaning. Greater ambiguity existed for emojis like smirking 😏 (20%), thumbs up 👍 (20%), high fives 🙏 (18%) and loved up 😍 (17%). Students projected diverse interpretations based on individual perceptions, rather than intended meaning. Other researchers have highlighted the socially constructed nature of emojis, where interpretation goes beyond official definitions (Barbieri et al., 2016; Lebduska, 2014). Risk of miscommunication is high when utilising such open-ended emojis in digital conversations.

To further explore emoji usage contexts, open-ended responses revealed that students predominantly use them to express emotions like happiness, sadness, love and pain. Emojis help visually articulated feelings and moods during emotional states or conversations. This aligns with research showing emojis' role in manifesting emotions and reactions (Bai et al., 2019; Cetinkaya, 2017; Barbieri et al., 2016). However, overuse may replace development of emotional vocabulary.

Generally, the results indicate deep entrenchment of emojis within students' WhatsApp communications to express emotions and enhance conversations. However, comprehension gaps exist, with risks of misinterpreting meaning. Usage is often instinctive rather than based on confirmed understanding. This exploration provides insights into emoji utilisation patterns and comprehension issues among Ghanaian students. The prevalent use of WhatsApp and emojis aligns with literature on young people digital communication preferences. The primacy of emojis for expressing emotions concurs with studies of their affective functions (Alshenqeeti, 2020; Boutet et al., 2021; Tigwell & Flatla, 2016; Bai et al., 2019). However, comprehension limitations found here contrast with assumptions that digital natives intuitively understand new technology.

The variability and misinterpretations in emoji meanings reflect arguments that usage is socially constructed beyond official definitions (Barbieri et al., 2016). Students projected their own perceptions when meanings were unclear. The context dependency and subjectivity of emojis highlighted by Lebduska (2014) is evidenced in these communication risks. The emotional contexts reported for emoji usage reflect recent studies on their role in manifesting feelings and moods (Bai et al., 2019). But over-dependence may inhibit development of emotional language. In conclusion, the results reveal how engrained emojis are in students' digital communications for emotional expression and interaction enhancement. However, comprehension gaps indicate usage is not always mindful. This highlights the need for greater critical awareness as emojis evolve as a prominent youth communication mode within digital environments.

DISCUSSION

This study investigates the utilisation and comprehension of emojis among Ghanaian tertiary students at the University for Development Studies. Usage patterns

and perspectives are explored through a survey, providing insights into the embedding of emojis within digital communication. Several key themes emerge around emoji adoption, purposes, comprehension gaps and misinterpretation risks. Students have rapidly incorporated emojis into messaging interactions, primarily for emotional expression. However, this enthusiasm outpaces understanding, with uncertainties and subjective interpretations indicating the socially constructed nature of emojis.

Prevalence of WhatsApp and emoji usage

The widespread use of WhatsApp among students aligns with literature on the platform's dominance for youth communications (Mustaffa and Ibrahim, 2014). Near ubiquitous adoption makes WhatsApp an important channel for information exchange and social interaction among digital natives. However, the finding that most respondents view WhatsApp information as reliable contrasts with research highlighting risks of misinformation on social media. This suggests students may lack critical perspectives on evaluating online information, indicating an area for further literacy development. Similarly, emojis are entrenched in students' WhatsApp messaging, with 47% using them always and a further 22% frequently. This echoes studies showing growing integration of emojis into digital communication by young people (Al Rashdi, 2018). Students have enthusiastically adopted emojis alongside text within messaging. The primary aim of expressing emotions reinforces evidence that affective functions are central to emoji usage, enabling transmission of feelings visually. Emojis also provide shortcuts to augment messages. However, high usage does not necessarily equate to comprehension, as discussed below.

Emoji comprehension uncertainties

Despite frequent use, just 40% of students were certain about emoji meanings. The majority were uncertain, highlighting comprehension limitations even among these digital natives. This aligns with research finding most users do not share understanding of emoji meanings and functions (Miller et al., 2016). Uncertainties were evidenced when students interpreted a sample of common emojis. Visual icons representing clear concepts like smiling or crying were accurately decoded. However, emojis with more ambiguous meanings saw diverse subjective interpretations based on individual perceptions. This disconnects between frequent use and limited understanding indicates adoption may

precede comprehension. Youth incorporate emojis into messaging out of desire for novelty before grasping meaning. Mindful usage requires literacy development. Uncertain meaning indicates usage is often unconscious. Students need guidance on interpreting emojis mindfully by considering context and multiple connotations to mitigate miscommunication risks (Tigwell & Flatla, 2016).

Risks of misinterpretation

The variability in emoji interpretations highlights the risk of misconstruing meaning in digital interactions. As scholars argue, emoji usage is socially constructed beyond official definitions (Barbieri et al., 2016). Users apply subjective perspectives, cultural contexts and platform differences which influence decoding of emojis (Lebduska, 2014). Misunderstandings and unintended meanings are likely when interpretations diverge between communicator and recipient. Even seemingly clear emojis may denote different sentiments based on context. These risks indicate using emojis requires an awareness of potential ambiguity and multiplicity of meanings. Developing critical perspectives on emoji usage, rather than assuming universal meaning, can mitigate misinterpretation. This points to a need for greater emoji literacy efforts among students to support comprehension.

Functions and contexts of emoji usage

Expressing emotions was the primary function students associated with emojis. Enabling communication of feelings and reactions through visual icons aligns with research on affective capacities of emojis. Emojis also provide shortcuts to enhance messages, with students using them to be more concise. However, overuse for brevity risks replacing words and hindering language development. Students must learn to balance efficiency with communicative richness. The circumstances for emoji usage further demonstrate their affective roles. Students predominantly employed them when expressing happiness, sadness, love and pain to convey emotional states. Emojis seem entwined with manifestation of feelings, particularly where verbal vocabulary proves challenging. However, an over-reliance on emojis in emotional communication may inhibit growth of emotional language literacy. While emojis can support emotional skills when applied judiciously, students must retain breadth of feeling vocabulary.

Implications for research and practice

In the context of Ghanaian higher education, the findings from this research on emoji usage in digital communication have several important implications. Firstly, the research underscores a significant gap in our understanding of emoji usage among young adults in academic settings. This gap implies a pressing need for more qualitative studies to gain in-depth insights into students' perspectives and experiences with emojis. The prevalence of emoji use in digital communication, coupled with potential misinterpretations, suggests that small focus groups could yield valuable data on comprehension issues and communication challenges faced by students.

Secondly, the findings highlight the lack of cross-cultural studies in this area. This absence implies that there may be significant, yet unexplored, variations in emoji usage and understanding across different global regions and age groups. The increasingly diverse student populations in Ghanaian universities make this implication particularly relevant, suggesting a need for comparative analyses to inform more culturally sensitive communication strategies. Thirdly, the research points to a potential link between emoji usage and emotional intelligence, an area that remains largely unexplored. This implies that the increasing reliance on emojis in digital communication may have far-reaching effects on the development of communication skills and social relationships among students. Longitudinal studies could provide crucial insights into these potential impacts, informing future educational strategies and policies.

Fourthly, the findings suggest a lack of formal guidance on emoji usage in academic environments. This implies a need for universities to develop comprehensive policies and guidelines for emoji use in official communications. The absence of such guidance could lead to miscommunication and potential breaches of academic etiquette, particularly in student-faculty interactions or formal academic discourse. Finally, the research highlights a general lack of emoji literacy among university students. This implies that current digital literacy programmes may be inadequate in addressing the complexities of emoji-based communication. It suggests that universities may need to revise their orientation programmes and ongoing digital literacy initiatives to include more focused attention on emoji usage and interpretation.

These implications collectively point towards a need for a more structured and informed approach to emoji use in academic settings. They suggest that universities, particularly in Ghana, may need to reassess their communication policies, digital literacy programmes, and cultural sensitivity training to better prepare students for effective communication in an increasingly emoji-rich digital landscape. These implications also underscore the importance of further research in this area to inform evidence-based policies and practices in higher education institutions.

Conclusions and recommendations

This study offers valuable insights into the use and understanding of emojis among Ghanaian university students in social media communications. The findings reveal that whilst students have enthusiastically adopted emojis to enhance their digital interactions, particularly in expressing emotions where their vocabulary may be limited, there exists a notable disparity between frequent usage and critical comprehension. The research indicates that students often interpret emojis based on personal experiences rather than standardised definitions, leading to individualised and potentially divergent understandings. This subjectivity in interpretation raises concerns about potential miscommunication, especially when the intended meaning of an emoji differs significantly between the sender and the recipient.

These findings underscore the importance of developing emoji literacy among university students. The study suggests implementing tailored educational programmes to enhance students' critical understanding and judicious use of emojis. Proposed initiatives include interactive workshops that encourage reflection on the variable meanings of emojis across different sociocultural contexts, and the potential for misinterpretation. The integration of emoji literacy into broader digital citizenship education within academic institutions is also recommended. The research advocates for a balanced approach to emoji usage, encouraging students to use emojis sparingly to enrich communication without over-relying on them at the expense of developing a broader emotional vocabulary. It is suggested that students be guided towards self-reflection on their emoji usage habits to promote more mindful application.

Furthermore, the study recommends leveraging students' creativity in designing awareness campaigns about potential emoji misinterpretations, which could enhance

understanding whilst engaging students actively in the learning process. The conclusions drawn from this research emphasise that emojis have become an integral part of student communication. However, they also highlight the need for more thoughtful usage underpinned by robust comprehension. The study calls for further research into the relationship between emoji usage and the development of emotional intelligence among young adults.

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