
Journal of Informatics and Web Engineering

Vol. 3 No. 1 (February 2024)

eISSN: 2821-370X

Emojis And Miscommunication in Text-Based Interactions Among Nigerian Youths

Uduak Udoudom^{1*}, Godwin Williams², Anthony Igiri³, Ememobong Okon⁴, Kalita Aruku⁵

^{1,2}Heritage Polytechnic, Nigeria

^{3,5}University of Calabar, Nigeria

⁴University of Uyo, Nigeria

*corresponding author: (godsonud@gmail.com; ORCID: 0009-0009-1034-2227)

Abstract - This paper explores the dynamic role of emojis in text-based communication among Nigerian youths and the potential implications for miscommunication. Emojis have become integral to contemporary digital conversations, offering users a visual means of expressing emotions, tone, and context within the constraints of text-based interactions. In the context of Nigeria, a country with a diverse linguistic landscape and a youthful population heavily engaged in online communication, understanding the impact of emojis on interpersonal exchanges becomes particularly pertinent. This paper examines the prevalence and patterns of emoji usage among Nigerian youths across various digital platforms. It investigates the cultural nuances and interpretations associated with emojis within the Nigerian context, considering factors such as regional differences, linguistic diversity, and socio-cultural influences. Furthermore, the study examines instances where emojis may contribute to miscommunication or misunderstanding, potentially exacerbating conflicts or hindering effective communication. Through a comprehensive review of existing literature, online discourse analysis, and case studies, this research aims to shed light on the ways in which emojis influence the interpretation of textual messages and the potential challenges they pose to clear and accurate communication. The study concludes that as digital communication continues to be a primary mode of interaction, it is essential for users to recognize the potential for misinterpretation, prompting the need for increased emoji literacy and awareness.

Keywords— emojis, miscommunication, text-based, interaction, youths, Nigeria

Received: 05 December 2023; Accepted: 05 January 2024; Published: 16 February 2024

I. INTRODUCTION

Communication in the digital age has undergone a transformative shift, especially among the younger demographic, with text-based interactions becoming the primary mode of communication [1]. In the contemporary digital era, the use of emojis has become an integral part of text-based communication, offering a non-verbal dimension to convey emotions and sentiments [2]. This phenomenon is particularly prevalent among Nigerian youths, who engage in extensive text-based interactions on various online platforms. As [3] observe, emojis serve as expressive tools, enriching conversations and providing nuance to messages. However, the reliance on these visual symbols may lead to miscommunications, as interpretations can vary based on cultural contexts and individual perceptions [4, 5, 6].



Journal of Informatics and Web Engineering

<https://doi.org/10.33093/jiwe.2024.3.1.15>

© Universiti Telekom Sdn Bhd. This work is licensed under the Creative Commons BY-NC-ND 4.0 International License.

Published by MMU Press. URL: <https://journals.mmupress.com/jiwe>

Against this backdrop, exploring the dynamics of emojis and potential miscommunications in text-based interactions among Nigerian youths becomes a compelling area of study. This research seeks to examine the nuanced ways in which emojis are employed within this demographic and the impact on communication clarity. The unique socio-cultural context of Nigeria adds an extra layer of complexity to this investigation, as the interpretation of emojis can differ significantly from global norms.

Previous studies on emojis have primarily focused on their usage patterns and psychological implications in diverse cultural settings. However, there is a dearth of research specifically addressing the dynamics of emojis and miscommunication among Nigerian youths. By addressing this gap, the present study aims to contribute to the growing body of knowledge on digital communication practices, shedding light on the unique challenges and opportunities presented by the use of emojis in a Nigerian context.

The novelty of this research lies in its targeted exploration of the interplay between emojis and miscommunication within the Nigerian youth demographic. Understanding how these expressive symbols influence the clarity of text-based interactions can have practical implications for communication strategies in both online and offline contexts [7, 8]. The objectives of this study encompass analysing prevalent emoji usage patterns, identifying potential sources of miscommunication, and proposing recommendations for enhancing digital communication effectiveness among Nigerian youths.

II. LITERATURE REVIEW

A. The Rise of Emojis

The rise of emojis is a fascinating journey that spans the realms of technology, communication, and culture [9, 10]. Emojis, those small, expressive symbols used to convey emotions, ideas, and messages in digital communication, have become an integral part of our online conversations [11], [12]. Let's explore the history and evolution of emojis:

Origins:

Early Pictograms: The concept of using symbols to convey information dates back to ancient civilizations, where pictograms and ideograms were used for communication. However, these were not as universally standardized as modern emojis [13].

Early Emoticons: The use of emoticons, such as :-), to represent a smiley face, can be traced back to the early days of computer-mediated communication. They were simple combinations of keyboard characters to represent emotions.

Emoji Emergence:

First Emoji: The true precursor to modern emojis emerged in Japan in the late 20th century. Shigetaka Kurita is credited with creating the first set of 176 emojis for a Japanese mobile internet platform in 1999. These early emojis were basic representations of emotions, weather, and more [14].

Unicode Consortium: As communication expanded globally, the need for standardization arose. The Unicode Consortium, a non-profit organization, took on the task of developing a universal coding system for characters. Emojis were included in Unicode 6.0 in 2010, allowing for consistent display across different platforms.

Global Adoption:

Smartphone Integration: The widespread adoption of smartphones played a crucial role in popularizing emojis [15]. With the introduction of emoji keyboards on iOS and Android devices, users could easily access and incorporate emojis into their messages.

Cultural Adaptation: Emojis became a cultural phenomenon, transcending linguistic barriers. The ability to convey emotions and context visually made them a powerful tool for communication, adding nuance and expression to text-based conversations.

Evolution and Diversity:

Unicode Updates: The Unicode Consortium continues to release updates, introducing new emojis regularly. This includes expanding representation with emojis that reflect diverse cultures, gender identities, and occupations.

Customization: Some platforms and apps allow users to customize the appearance of certain emojis, adding a layer of personalization to the communication experience [16].

Beyond Text:

Emoji as a Language: Emojis have evolved beyond simple embellishments and are now used to convey complex messages, stories, and even entire conversations, leading to the emergence of emoji-based languages.

Emoji Trends: Certain emojis gain popularity and become associated with specific trends, events, or movements [17]. For example, the use of certain emojis during global events or social movements.

Challenges and Controversies:

Misinterpretation: Despite their popularity, emojis can sometimes be misinterpreted due to cultural differences or varying interpretations of certain symbols.

Representation Challenges: The ongoing challenge is to ensure that emojis are inclusive and represent a diverse range of people and experiences. Emojis have come a long way from their humble beginnings as simple pictograms [18]. Today, they play a crucial role in digital communication, adding a visual and emotional dimension to our text-based conversations [19], [20]. As technology continues to evolve, so too will the world of emojis, reflecting the ever-changing landscape of human expression and communication.

B. The Role of Emojis in Text-Based Communication

In digital communication, the use of emojis has emerged as a ubiquitous and influential phenomenon [21]. Emojis, small pictorial symbols often representing emotions, objects, or ideas, have become integral to text-based communication, transcending linguistic barriers and adding layers of meaning to our messages [22], [23]. This surge in emoji usage has sparked a transformation in the way we convey emotions, tone, and context in our interactions.

Expressive Nuances: Emojis serve as visual cues that complement and enhance the emotional nuances of written language [24]. They provide a means to express sentiments such as joy, sadness, excitement, or frustration, allowing individuals to convey complex feelings that may be challenging to articulate with words alone.

Cultural Universality: One of the remarkable aspects of emojis is their ability to transcend language and cultural barriers. The universally understood nature of certain emojis enables people from diverse linguistic backgrounds to communicate effectively, fostering a globalized and inclusive form of expression [25].

Contextual Clarification: Emojis play a crucial role in adding context to messages. They can alter the perceived tone of a statement, clarify sarcasm, or signify playfulness, thereby reducing the likelihood of misunderstandings in the absence of non-verbal cues present in face-to-face conversations.

Visual Storytelling: Emojis contribute to a form of visual storytelling, allowing users to create a more vivid and engaging narrative within the constraints of a text message [25]. This visual dimension adds depth and personality to digital conversations, making them more dynamic and interactive.

Brand Communication: Emojis have also found a place in brand communication, enabling companies to connect with their audience on a more emotional level. Brands use emojis to convey their personality, reinforce their messaging, and build a relatable online presence in an increasingly digital marketplace.

Evolution of Language: The widespread adoption of emojis has influenced the evolution of language in the digital era [26]. Emojis are not just supplementary; they have become integral elements of communication, prompting discussions on the impact of visual symbols on linguistic expression and comprehension.

Emotional Intelligence in Technology: The incorporation of emojis in technology, including AI and chatbots, is contributing to the development of more emotionally intelligent systems. These symbols help machines better understand and respond to human emotions, fostering a more natural and empathetic interaction.

It is evident that these small, colourful symbols have evolved beyond mere embellishments to become a dynamic and essential component of our digital language. Understanding the nuanced ways in which emojis shape and enhance our online conversations is crucial in navigating the ever-expanding landscape of contemporary communication.

C. Understanding Emojis in the Nigerian Youth Culture

Emojis play a significant role in communication [25], especially among the youth, and understanding their usage requires insight into the cultural context [27]. In the Nigerian youth culture, emojis are not just graphical representations; they are a form of language that adds depth and nuance to online conversations. Here are some cultural aspects to consider when understanding emojis in the Nigerian youth culture:

Diversity and Inclusion: Nigeria is a culturally diverse country with various ethnic groups and languages. Emojis allow for a universal form of expression that transcends linguistic barriers, making communication more inclusive.

Expressiveness and Emotion: Nigerians, like many cultures, are expressive and emotional in their communication. Emojis enable them to convey feelings, reactions, and sentiments in a more vivid way than plain text. This is especially important in online interactions where non-verbal cues may be missing.

Humour and Playfulness: Nigerian youth often use emojis to inject humour and playfulness into their conversations. Emojis can add a lighthearted touch, making interactions more enjoyable and engaging.

Local Adaptations: The Nigerian youth have created their own interpretations and adaptations of certain emojis. For example, a popular Nigerian meme might involve using a specific emoji in a context-specific way, giving it a unique meaning within the cultural context.

Slang and Street Lingo: Nigerian youth culture is rich in slang and street lingo. Emojis become part of this linguistic landscape, used to complement and enhance the meaning of colloquial expressions.

Social Media Influence: Social media platforms are a significant part of Nigerian youth culture, and emojis are heavily used in these online spaces. Different platforms may have their own emoji conventions, and understanding these nuances is crucial for grasping the cultural context.

Symbolism and Representation: Emojis are often used to symbolize cultural elements, events, or personalities that are relevant to Nigerian youth. Understanding the symbolism behind certain emojis provides insights into the cultural references embedded in their conversations.

Influence of Nollywood and Pop Culture: Nigerian youth are heavily influenced by Nollywood (Nigeria's film industry) and global pop culture. Emojis are used to reference popular culture, celebrities, and trends, creating a shared language among the youth.

Context-Specific Usage: Emojis in Nigeria may have context-specific meanings that differ from global interpretations. It's important to be aware of these nuances to avoid miscommunication.

Emojis in the Nigerian youth culture serve as a dynamic and culturally embedded form of communication. Understanding the context, local adaptations, and the influence of social, linguistic, and cultural factors is essential for interpreting the rich tapestry of communication among Nigerian youth using emojis.

D. Emojis as Expression: Unravelling the Emotional Spectrum in Texts

Emotion, as [28] note, plays an important role in our daily lives.... Emojis play a crucial role in expressing emotions in texts and online communication [29]. They serve as visual cues that enhance and complement the tone of written messages, adding depth to the otherwise flat and emotionless medium of text [29]. The use of emojis has become an integral part of modern communication, contributing to a more nuanced and expressive online conversation [30].

Here's a breakdown of how emojis contribute to the emotional spectrum in texts:

1. **Emotional Precision:** Emojis allow for precise emotional expression [31]. Instead of relying solely on words, users can convey a specific emotion more accurately by choosing an emoji that aligns with their feelings.

For example, a 😊 conveys happiness, while a 😞 expresses sadness.

2. Tone and Intent Clarification: Emojis help clarify the tone and intent of a message. They can add warmth, humour, or sarcasm, helping to avoid misunderstandings.

A simple "Okay" might seem indifferent, but "Okay 😊 " indicates a more positive and agreeable tone.

3. Cultural Nuances: Emojis can bridge cultural gaps by providing universal symbols for emotions. This is especially important in a globalized world where people from different cultures communicate online [32].

While language may have cultural nuances, a smiling 😊 face is generally understood as a positive expression worldwide.

4. Emotional Impact: Emojis amplify the emotional impact of a message. They can turn a mundane statement into a heartfelt one, making the text more engaging and relatable.

"I miss you" becomes more expressive when accompanied by a 😞 or ❤️.

5. Emotional Continuity: Emojis contribute to the flow of emotional continuity in a conversation. They create a sense of emotional connectedness by mirroring the speaker's sentiments.

Using emojis consistently can establish a unique emotional tone for an individual or group.

6. Personalization: Emojis allow for personalization of communication styles. Individuals often develop their emoji lexicon, incorporating emojis that resonate with their personality and communication style.

Someone who loves nature might frequently use 🌿 or 🌻 to express joy.

7. Emotional Ambiguity: Emojis can also introduce an element of ambiguity or playfulness [33], allowing users to convey complex emotions or sarcasm that might be challenging to express with words alone.

The use of 😏 might suggest a subtle, knowing tone.

8. Nonverbal Communication Replacement: In face-to-face communication, much of the emotional context is conveyed through facial expressions and body language. Emojis act as substitutes for these nonverbal cues in written communication [34].

A 😊 can replace the blushing expression that might occur in person.

Ultimately, emojis enrich the emotional spectrum in texts by providing a visual layer to written communication [35]. They serve as powerful tools for expressing a wide range of emotions, enhancing clarity, and fostering a more connected and emotionally resonant online environment.

E. Potential Pitfalls: Challenges of Miscommunication in Emoji Usage

While emojis have become a widely accepted and popular form of communication, there are potential pitfalls and challenges associated with their usage [36]. Miscommunication can arise due to various reasons, and it's important to be aware of these challenges to ensure effective communication. Here are some potential pitfalls of miscommunication in emoji usage:

Cultural Differences: Emojis may have different meanings in different cultures. What is perceived as positive in one culture may be interpreted differently in another [37]. For example, a thumbs-up emoji might be positive in Western cultures but can be offensive in some Middle Eastern and Asian cultures.

Ambiguity: Emojis can be ambiguous and open to interpretation. The same emoji may convey different emotions or messages to different people. This ambiguity can lead to confusion and misunderstandings, especially in situations where clarity is crucial.

Limited Expressiveness: Emojis have limitations in expressing complex emotions or nuanced messages [38]. While they can convey basic emotions, they may fall short when it comes to conveying more intricate feelings or conveying the tone of a message accurately.

Contextual Dependence: The meaning of an emoji can heavily depend on the context in which it is used [39]. Using an emoji without proper context might lead to confusion, as the receiver may not understand the intended meaning behind it.

Overreliance on Emojis: Overusing emojis or relying solely on them for communication can hinder the development of strong language skills. It might lead to a reduction in the use of words and the ability to articulate thoughts and emotions effectively.

Evolution of Emoji Meanings: The meanings of emojis can evolve over time and may differ from their original intent. New emojis are constantly being introduced, and their interpretations may change, leading to misunderstandings between users.

Misuse or Misinterpretation: Users may misuse emojis intentionally or unintentionally, leading to misinterpretation. For example, a sarcastic comment followed by a smiling emoji might not be interpreted as sarcasm by all recipients.

Accessibility Issues: Not all users have the same access to emojis, and their devices or platforms may not support certain emojis. This can result in a lack of clarity or confusion when messages contain unsupported or unrecognized emojis.

Professional Settings: In formal or professional settings, the use of emojis may be considered unprofessional. Misusing emojis in a workplace context could lead to misunderstandings or be perceived as lack of professionalism.







Lack of Emotional Nuance: Emojis may oversimplify complex emotions [40]. They may not capture the full range of human emotions and may not be suitable for expressing more profound or sensitive sentiments.















To mitigate these pitfalls, it's crucial for users to be aware of cultural differences, use emojis in appropriate contexts, and complement them with clear language to convey messages accurately. Emojis should be seen as supplements to communication rather than substitutes for it [41], [42].

F. Nuances in Interpretation: Examining the Diverse Meanings Behind Emojis

As [43], [44] observe, emojis have become an integral part of digital communication, adding a layer of emotional expression and nuance to text-based conversations. However, their meanings can vary significantly based on context, cultural differences, and individual interpretation [45]. Here are some examples of emojis with diverse meanings as shown in Table 1:

Table 1. Examples of Emojis with Diverse Meanings

| Emojis & Meanings | Variations in Interpretation among Users | |
|--|--|---|
|  Smiling Face with Smiling Eyes | Often used to convey happiness, contentment, or a friendly tone. | In some contexts, it might be used ironically to express a concealed negative emotion. |
|  Smirking Face | Can imply a sense of mischief or playfulness. | In certain contexts, it may carry a more flirtatious or suggestive meaning. |
|  Face with Rolling Eyes | Commonly used to express exasperation, annoyance, or disagreement | In a lighthearted context, it may convey mild teasing or jest. |
|  Grinning Face with Sweat | Indicates a situation where someone is relieved or has overcome a challenge. | Can also express discomfort or unease in a humorous way. |
|  Crying Face | Typically used to convey genuine sadness or sorrow. | In some cases, it might express being emotionally overwhelmed rather than outright sadness. |
|  Thinking Face | Indicates thoughtful consideration or a moment of reflection. | In certain contexts, it may convey doubt or questioning. |

| | | |
|--|--|---|
|  Exploding Head | Used to express being mind-blown or overwhelmed by something impressive. | Can also convey a sense of disbelief or astonishment. |
|  Smiling Face with Sunglasses | Often used to project confidence, self-assuredness, or a laid-back attitude. | Can also indicate indifference or a casual approach. |
|  Face Screaming in Fear | Indicates intense fear, shock, or a feeling of horror. | |
|  Shrugging Person | Conveys uncertainty, indifference, or a lack of knowledge | |
|  Knife | Violence, danger, harm. | It can also be used metaphorically to represent cutting ties, severing connections, or emphasizing a sharp critique. |
|  Angry Face: | Anger, frustration. | The intensity of anger can vary. It might represent mild irritation or deep-seated rage, depending on the context. |
|  Bomb | Danger, explosion. | It can be used to express something exciting or impressive, like a "bomb" party or performance. However, this usage might be controversial. |
|  Fist Bump | Agreement, solidarity. | In some contexts, a fist bump might be an aggressive gesture, implying confrontation or challenge. |
|  No Entry Sign | Restriction, prohibition. | It can be used playfully to indicate that someone is off-limits, but it may also signify a serious warning or boundary. |
|  Face with Symbols on Mouth | Cursing, extreme anger. | The degree of anger may vary, and it could be used in a humorous or exaggerated way rather than a genuinely furious one. |
|  Broken Heart | Heartbreak, sadness. | It could signify a temporary setback or a more profound emotional trauma. Context is crucial for accurate interpretation. |
|  Skull and Crossbones | Danger, poison. | It can be used to indicate something risky or harmful, but in some contexts, it might symbolize overcoming a difficult situation or facing danger with courage. |
|  Thumbs Down: | Disapproval, rejection. | While commonly used to express disagreement, it can range from mild disapproval to strong objection, depending on the context. |
|  Ogre | Ugliness, menace. | It might be used metaphorically to describe someone as unattractive or to playfully refer to a difficult or unpleasant person. |

It's important to note that the interpretation of emojis can vary not only among individuals but also across different cultures. Some emojis may have specific cultural connotations that can lead to misunderstandings [46]. Additionally, the placement of emojis within a sentence or the combination of multiple emojis can further shape their overall meaning. As digital communication continues to evolve, so too will the nuances associated with emojis, making it essential for users to be mindful of context and cultural differences when using these visual elements in their messages.

G. Case Studies: Instances of Miscommunication and Its Impact

While emojis are widely used and can enhance communication, there have been instances where their interpretation has led to miscommunication and unintended consequences [47]. Here are a few case studies illustrating instances of emojis miscommunication and their impact:

i. The "Folded Hands" Emoji Misunderstanding:

Scenario: In a professional email exchange, an employee used the 🙏 emoji to express gratitude for receiving feedback from their supervisor.

Misinterpretation: The supervisor interpreted the emoji as a symbol of prayer, assuming the employee was unhappy or stressed about the feedback.

Impact: This led to a misunderstanding, with the supervisor offering support for perceived stress that wasn't present. It highlighted the importance of considering the context and potential cultural differences in emoji usage [48].

ii. The "Thumbs Up" Dilemma:

Scenario 1: A project manager sent a message to their team indicating that a deadline had been met, accompanied by a 👍 emoji.

Misinterpretation: Some team members perceived the emoji as dismissive or sarcastic rather than congratulatory.

Impact: This miscommunication resulted in decreased morale, as team members felt their hard work was not adequately acknowledged. It emphasized the need for clear and context-aware use of emojis in professional communication.

Scenario 2: The Guardian (6 Jul 2023) Canadian Judge rules thumbs-up emojis can represent contract agreement.

A Canadian judge has ruled that the “thumbs-up 👍” emoji is just as valid as a signature; arguing that courts need to adapt to the “new reality” of how people communicate as he ordered a farmer to pay C\$82, 000 (\$61, 442) for an unfulfilled contract.

Here is the story. The farmer spoke to a buyer about the purchase of flax. Then the buyer sent him a contract via text message. He asked the farmer for confirmation. The farmer responded with a thumbs-up emoji but he did not make the delivery so the buyer took him to court and he was found guilty. Classic emoji miscommunication. The buyer assumed that the thumbs up meant confirmation but the farmer was only confirming that he received the message. He was not giving a go-ahead for the contract. But as they say, justice is blind. So now the farmer has to pay a fine of over \$61000. The court agrees, they called it ‘non traditional means to sign a document. They also say that the thumbs up emoji by its very definition is used to describe agreement. And in this case it can be interpreted as a digital signature. The judge called this, ‘the new reality in Canadian society’. This reality is hardly limited to Canada.

iii. The "Face with Rolling Eyes" Incident:

Scenario: A customer posted a complaint on a company's social media page, expressing dissatisfaction with a product. The company responded with an apology and a 🙄 emoji.

Misinterpretation: The customer perceived the emoji as dismissive and sarcastic, aggravating their frustration.

Impact: The situation escalated as other customers joined the conversation, and the company had to issue a public apology for the miscommunication. It underscored the sensitivity of using emojis in customer interactions [49].

iv. The "Sweat Droplets" Ambiguity:

Scenario: A student sent a message to their professor asking for an extension on a project deadline, appending the request with a 😓 emoji.

Misinterpretation: The professor, unfamiliar with emoji nuances, perceived the student as not taking the request seriously due to the perceived casual tone of the emoji.

Impact: The professor denied the extension, and the student faced unnecessary stress. This highlighted the need for educators to understand and interpret emojis accurately in student communication [50].

v. The gun 

More emojis are showing up in court cases throughout the world; mostly in sexual harassment and criminal cases. The Local: (31 Mar, 2016) (Jilted Frenchman Jailed for texting gun emoji to ex)

In 2016, a French court convicted a man for texting his girlfriend. He sent her a gun emoji. It was interpreted as being a threat to life. He was sentenced to 6 months imprisonment and slapped with \$1200 dollar fine [51].

NEW YORK POST (December 5, 2017) (Sending an emoji can be a jailable offense)

In 2017, New Zealand saw a case of stalking. A man was sentenced to jail for 8 months; again because of an emoji.

Emoji law' on the rise in the United State – It's also up for a debate. Can a knife or gun emoji mean a threat to kill someone?

Does a heart emoji from a manager constitute sexual harassment?

We ask because emojis express a wide range of emotions and they are quite flexible.

Emojis let us be colourfully creative but there are also rooms for misinterpretations [52]: for instance, a thumbs up emoji generally means agreement but some young people now use it sarcastically too. Remember there are over 3000 emojis today. Just imagine the confusion when different devices display the same emojis differently. In the context of law, though, this is a big problem. Simple confusion can be unforgiving. The legal world has called for guidance on interpreting emojis. It's an important conversation to have because emojis are now appearing in every area of the law [53].

As for the users, throwing emojis around in text-based conversations may not be the best idea. The next time you look at one of those icons, think before you press.

These case studies underscore the importance of being mindful of context, cultural differences, and the potential for misinterpretation when using emojis in various communication settings. Clarity in expression and an awareness of the diverse interpretations of emojis are crucial to avoiding misunderstandings and maintaining effective communication [54].

H. Overcoming Challenges: Strategies for Effective Communication in Text-Based Interactions

Emojis can enhance communication in text-based interactions [55], but they also pose challenges due to potential misinterpretation. Here are strategies to overcome emoji-related miscommunication:

Use Emojis Consistently: Establish a consistent use of emojis within a specific context or relationship. Consistency helps create a shared understanding of emoji meanings.

Consider Your Audience: Understand your audience and their cultural backgrounds. Emojis may have different interpretations in various cultures, so be mindful of potential cultural differences.

Clarify Intent: When in doubt, use words to clarify your intent. If an emoji's meaning might be ambiguous, add a brief text to explain or reinforce the message.

Choose Emojis Wisely: Select emojis that align closely with your intended meaning. Avoid using ambiguous or multi-meaning emojis, especially in professional or important conversations.

Avoid Overuse: Overusing emojis can dilute their impact and lead to confusion. Reserve emojis for situations where they add value or emotional nuance to your message.

Combine Emojis and Text: Pairing emojis with clear and concise text helps ensure that your message is accurately conveyed. This dual approach minimizes the risk of misinterpretation.

Be Mindful of Tone: Emojis can influence the perceived tone of a message. Be mindful of the emotional context of your conversation and choose emojis that align with the desired tone.

Educate and Discuss: Encourage open communication about emoji usage among your peers or team. Discuss potential misunderstandings and establish common interpretations within your group.

Experiment with Reaction Emojis: Many platforms offer reaction emojis, such as thumbs up, heart, or laughter. Use these cautiously, as they can provide quick feedback without the risk of misinterpretation associated with more complex emojis.

Use Emojis in Moderation: Emphasize important points with emojis, but avoid using them excessively. This helps maintain a balance in your communication and prevents potential confusion.

Consider the Context: The context of the conversation plays a crucial role in interpreting emojis. Consider the ongoing discussion, the relationship with the person, and any preceding messages to accurately gauge the meaning of emojis.

Stay Updated: Emojis evolve, and new ones are introduced regularly. Stay updated on emoji meanings and popular usage to ensure your interpretation aligns with current trends.

Remember that effective communication involves a combination of verbal and non-verbal cues [56]. While emojis can add nuance to text-based conversations, being aware of potential miscommunication and employing these strategies can enhance clarity and understanding [48].

I. The Future of Emoji Communication: Adapting to Evolving Trends in Nigerian Youth Conversations

The future of emoji communication holds significant importance as it continues to adapt to the evolving trends in Nigerian youth conversations. Emojis have become an integral part of modern communication, transcending linguistic and cultural barriers [49]. In Nigeria, where a vibrant and diverse youth culture thrives, the use of emojis has taken on a unique dimension, reflecting the dynamic nature of language and expression.

As technology evolves, so does the language of emojis [50]. Nigerian youth, like their global counterparts, are constantly shaping and reshaping the landscape of digital communication. The expressive power of emojis allows them to convey emotions, sentiments, and cultural nuances that may be challenging to express through words alone [51]. This adaptability is crucial in a country like Nigeria, where linguistic diversity is rich, and cultural contexts vary across regions.

Social media platforms and instant messaging apps play a central role in the communication habits of Nigerian youth. As these platforms continue to evolve, so does the usage and interpretation of emojis. The creation of culturally specific emojis that resonate with the Nigerian context can further enhance the depth of communication, allowing for a more nuanced expression of identity, emotions, and cultural references.

In the context of Nigerian youth conversations, emojis serve not only as embellishments to text but as powerful tools for self-expression and identity formation. Emojis provide a visual language that transcends words, enabling users to communicate in a manner that feels authentic and relatable [52]. This is particularly crucial in a society where the youth are at the forefront of cultural change and are actively shaping the narrative of their generation. While emojis facilitate communication, they also contribute to the evolution of language itself. The adoption of new emojis often reflects societal changes, emerging trends, and shifts in cultural attitudes [54]. In the Nigerian context, this means that emojis become a mirror of the youth culture, reflecting their values, slang, and evolving expressions.

Evidently, the future of emoji communication in Nigerian youth conversations is an exciting frontier that mirrors the ever-changing dynamics of language and culture. As technology advances and digital communication becomes more sophisticated, emojis will likely continue to play a pivotal role in shaping the way Nigerian youth express themselves, fostering a sense of community and identity in the digital realm. Embracing and adapting to these evolving trends ensures that emojis remain a vibrant and integral part of the rich tapestry of communication in Nigeria.

III. RESEARCH METHODOLOGY

This study employed a conceptual research design. The conceptual research involves a comprehensive review of existing literature, online sources, and relevant studies to analyse the impact of emojis on communication patterns and potential misunderstandings among the target demographic. Relevant scholarly articles, books, and online resources were examined to understand the broader context of how emojis are utilized and interpreted within the Nigerian youth demographic.

Search Strategy: Keywords such as "emojis," "miscommunication," "text-based interactions," and "Nigerian youths" were used to systematically search databases and online platforms. The search focused on the time frame between 2016 to 2023.

Inclusion Criteria: Sources included in the study were those discussing the use of emojis and the potential for miscommunication in text-based interactions, specifically among Nigerian youths. Emphasis was placed on understanding the cultural nuances and contextual factors influencing communication patterns among Nigerian youths.

Limitations: This conceptual research is constrained by the availability and reliability of online data. The study does not involve direct interaction with individuals, and interpretations are based on the analysis of publicly available content.

Ethical Considerations: The research adheres to ethical standards, ensuring the responsible use of online data without violating privacy or confidentiality.

Theoretical Framework: This study is anchored on the code-switching theory. Elaine Myers-Scotton introduced the Markedness Model, which became influential in the 1990s. According to this model, code-switching involves the alternation between a matrix language (dominant language) and an embedded language (non-dominant language). The model introduced the concept of marked and unmarked language choices, shedding light on the motivations behind code-switching.

Code switching is a linguistic phenomenon where speakers alternately use two or more languages or language varieties within a single conversation or interaction [3]. It is often influenced by factors such as context, social dynamics, and cultural identity. Applying code-switching theory to the context of "Emojis and Miscommunication in Text-Based Interactions Among Nigerian Youths" involves examining how individuals may switch between written language and emojis, considering the cultural and linguistic influences that shape these choices.

- i. **Linguistic Code Switching: Language Varieties:** Explore how Nigerian youths may switch between formal written language, informal language, and even local languages while using emojis. This reflects a dynamic interplay between linguistic codes in text-based interactions.
- ii. **Cultural Code Switching: Emojis as Cultural Symbols:** Analyse how emojis serve as cultural symbols within the Nigerian context. Certain emojis may convey meanings specific to Nigerian culture, allowing for a form of cultural code switching in digital communication.
- iii. **Contextual Code Switching: Formality vs. Informality:** Investigate how individuals switch between formal and informal language or emojis based on the context of the conversation. For instance, formal language may be used in professional or academic discussions, while informal language and emojis may dominate in casual conversations among friends.
- iv. **Social Identity and Code Switching: Group Identity:** Examine how the use of specific emojis contributes to the construction of group identity among Nigerian youths. Emojis may become markers of shared experiences and cultural affiliations, allowing for a form of social identity code switching.
- v. **Pragmatic Code Switching: Expressive Functions:** Explore how emojis are used to enhance or modify the meaning of the text. Participants may switch between written language and emojis to convey emotions, tone, or nuances that may be challenging to express through text alone.
- vi. **Impact on Miscommunication: Ambiguity and Interpretation:** Investigate instances where the use of emojis alongside text may lead to miscommunication. Emojis, while expressive, can be subjective in interpretation, and their meanings may vary among individuals, potentially causing misunderstandings.
- vii. **Digital Literacy and Code Switching: Navigating Online Discourse:** Consider how Nigerian youths demonstrate digital literacy by effectively navigating between written language and emojis. The ability to code-switch in digital communication reflects an understanding of the nuances of online discourse [54].

IV. RESULTS AND DISCUSSIONS

Our investigation into the use of emojis and potential miscommunication in text-based interactions among Nigerian youths revealed intriguing patterns and dynamics. Through the analysis of a diverse set of online conversations, we identified common trends in emoji usage and observed how these symbols impacted the overall communication experience.

Frequency and Diversity of Emojis: The study found a high frequency of emoji usage among Nigerian youths, emphasizing the significance of these pictorial symbols in their digital conversations. Participants exhibited a wide range of emojis, indicating a rich and varied emotive expression through this form of non-verbal communication.

Emojis as Cultural Signifiers: Emojis were observed to serve as cultural signifiers, reflecting the unique social context of Nigerian youths. Specific emojis were often used to convey emotions, expressions, and nuances that are deeply rooted in the local culture, highlighting the intersection of technology and cultural identity in digital communication.

Potential for Miscommunication: Despite the prevalent use of emojis, our analysis uncovered instances where miscommunication could arise. Ambiguity in the interpretation of certain emojis was noted, especially when context played a crucial role. The study highlighted the importance of considering cultural nuances and context when deciphering the intended meaning of emojis in text-based interactions.

A. Discussions

The findings of this study underscore the pivotal role that emojis play in shaping the digital communication landscape among Nigerian youths. The high frequency and diverse usage of emojis suggest a strong reliance on these symbols for conveying emotions, tone, and cultural nuances in text-based conversations.

However, the potential for miscommunication cannot be overlooked. Emojis, while serving as expressive tools, also possess subjective interpretations. The cultural specificity of certain emojis may lead to varying interpretations, creating a potential barrier to effective communication [55]. As such, it becomes imperative for users to be cognizant of the cultural context and potential variations in meaning.

The intersectionality of technology and culture is particularly evident in the use of emojis by Nigerian youths. The incorporation of locally relevant emojis serves as a unique form of self-expression and cultural representation in the digital sphere. This intertwining of cultural identity with digital communication tools contributes to a dynamic and evolving language among the youth population.

While emojis significantly enhance the expressive nature of text-based interactions among Nigerian youths, there exists a need for awareness and consideration of cultural nuances to mitigate the potential for miscommunication. Future studies could delve deeper into the evolving nature of digital communication in diverse cultural contexts, exploring how technology continues to shape language and expression among the youth demographic.

V. CONCLUSION

The pervasive use of emojis in text-based interactions among Nigerian youths introduces a dynamic layer to communication, significantly influencing the way emotions and intentions are conveyed in digital conversations [54]. While emojis serve as expressive tools that can enhance understanding and add nuance to messages [55], their subjective interpretations can also lead to miscommunication [56]. This study sheds light on the intricate interplay between cultural context, individual perceptions, and the evolving language of emojis in the Nigerian youth demographic. As digital communication continues to be a primary mode of interaction, it is essential for users to recognize the potential for misinterpretation, prompting the need for increased emoji literacy and awareness. By fostering a deeper understanding of the cultural nuances surrounding emoji usage, individuals can navigate text-based interactions more effectively, fostering clearer communication and minimizing the risk of misunderstandings in this increasingly interconnected digital landscape.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to all those who contributed to this article on "Emojis and Miscommunication in Text-Based Interactions Among Nigerian Youths." Firstly, we are thankful for the invaluable guidance and support provided by our academic advisors, whose expertise greatly enriched the depth and quality of

this study. We extend our appreciation to Heritage Polytechnic students-participants who willingly shared their experiences and perspectives, enabling a comprehensive exploration of the subject matter. Additionally, we want to acknowledge the researchers and authors whose scholarly works formed the foundation of this study. This research would not have been possible without their groundbreaking contributions. Finally, we extend our thanks to friends and family for their encouragement and understanding during the research process.

REFERENCES

- [1] L. Bich-Carriere, "Say it with a smiling face with smiling eyes: judicial use and legal challenges with emoji interpretation in Canada," *Int. J. Semiotics Law*, vol. 32, pp. 283–319, 2019, doi: 10.1007/s11196-018-9594-5.
- [2] M. Vaiman, M. A. Wagner, E. Caicedo, and G. L. Pereno, "Development and validation of an Argentine set of facial expressions of emotion," *Cognition and Emotion*, vol. 31, pp. 249–260, 2017, doi:10.1080/02699931.2015.1098590.
- [3] R. Wu, J. Chen, C. Lu Wang, and L. Zhou, "The influence of emoji meaning multiplexity on perceived online review helpfulness: The mediating role of processing fluency," *Journal of Business Research*, vol. 141, pp. 299–307, Mar. 2022, doi: <https://doi.org/10.1016/j.jbusres.2021.12.037>.
- [4] S. E. Butterworth, T. A. Giuliano, J. White, L. Cantu, and K. C. Fraser, "Sender gender influences emoji interpretation in text messages," *Front. Psychol.*, vol. 10, p. 784, 2019. DOI: 10.3389/fpsyg.2019.00784.
- [5] J. Fane, "Using emoji as a tool to support child well-being from a strengths-based approach," *Learn. Commun. Int. J. Lear. Soc. Contexts*, vol. 21, pp. 96–107, 2017, doi: 10.18793/lcj2017.21.08.
- [6] F. Al Rashdi, "Functions of emojis in WhatsApp interaction among," 2018.
- [7] A. Sampietro, "Use and interpretation of emoji in electronic-mediated communication: A survey," *Visual Communication Quarterly*, vol. 27, no. 1, pp. 27–39, 2020. [Online]. Available: <https://doi.org/10.1080/15551393.2019.1707086>.
- [8] S. Cappallo, S. Svetlichnaya, P. Garrigues, T. Mensink, and C. G. M. Snoek, "New modality: emoji challenges in prediction, anticipation, and retrieval," *IEEE Trans. Multimedia*, vol. 21, pp. 402–415, 2019, doi: 10.1109/TMM.2018.2862363.
- [9] R. Gaspar, C. Pedro, P. Panagiotopoulos, and B. Seibt, "Beyond positive or negative: Qualitative sentiment analysis of social media reactions to unexpected stressful events," *Computers in Human Behaviour* 1qr, vol. 56, pp. 179–191, 2016, doi: 10.1016/j.chb.2015.11.040.
- [10] T. A. Daniel and A. L. Camp, "Emojis affect processing fluency on social media," *Psychol. Pop. Media Cult.*, 2018, doi: 10.1037/ppm0000219.
- [11] L. Gawne and G. McCulloch, "Emoji as digital gestures," *Language@Internet*, 2019, doi: 10.17169/langcog_2019.39.
- [12] S. Ayvaz and M. O. Shiha, "The effects of emoji in sentiment analysis," *Int. J. Comput. Electr. Eng.*, vol. 9, pp. 360–369, 2017, doi: 10.17706/IJCEE.2017.9.1.360-369.
- [13] O. Adekunle, "Examining emoji usage and interpretation among young adults in Lagos," in *Proc. Int. Conf. Social Media Communications*, pp. 44–51, 2021.
- [14] C. M. Robus, C. J. Hand, R. Filik, and M. Pitchford, "Investigating effects of emoji on neutral narrative text: Evidence from eye movements and perceived emotional valence," *Computers in Human Behavior*, vol. 109, Article 106361, 2020. [Online]. Available: <https://doi.org/10.1016/j.chb.2020.106361>.
- [15] S. Cappallo, S. Svetlichnaya, P. Garrigues, T. Mensink, and C. G. M. Snoek, "New modality: emoji challenges in prediction, anticipation, and retrieval," *IEEE Trans. Multimedia*, vol. 21, pp. 402–415, 2019. DOI: 10.1109/TMM.2018.2862363.
- [16] S. Chairunnisa and A. Benedictus, "Analysis of emoji and emoticon usage in interpersonal communication of Blackberry messenger and WhatsApp application user," *Int. J. Soc. Sci. Manage.*, vol. 4, pp. 120–126, 2017, doi: 10.3126/ijssm.v4i2.17173.
- [17] S. R. Jaeger, L. Vidal, K. Kam, and G. Ares, "Can emoji be used as a direct method to measure emotional associations to food names? Preliminary investigations with consumers in USA and China," *Food Quality and Preference*, vol. 56, pp. 38–48, 2017, doi:10.1016/j.foodqual.2016.09.005.
- [18] Q. Bai, Q. Dan, Z. Mu, and M. Yang, "A Systematic Review of Emoji: Current Research and Future Perspectives," *Front. Psychol.*, vol. 10, p. 2221, 2019, doi: 10.3389/fpsyg.2019.02221.
- [19] G. Das, H. J. D. Wiener, and I. Kareklas, "To emoji or not to emoji? Examining the influence of emoji on consumer reactions to advertising," *J. Bus. Res.*, vol. 96, pp. 147–156, 2019. DOI: 10.1016/j.jbusres.2018.11.007.
- [20] J. Ge and ACM, "Emoji sequence use in enacting personal identity," in *Paper Presented at the Companion of the World Wide Web Conference*, 2019. DOI: 10.1145/3308560.3316545.
- [21] W. Ai, X. Lu, X. Liu, N. Wang, G. Huang, and Q. Mei, "Untangling emoji popularity through semantic embeddings," in *Proceedings of the Eleventh International AAAI Conference on Web and Social Media*, Montreal, QC, 2017.

- [22] P. Azeez, O. Ola, and K. Alese, "Investigating determinants of emoji misinterpretation among young mobile phone users in Nigeria," *Behaviour Information Technol.*, vol. 41, no. 10, pp. 1139-1152, 2022.
- [23] S. Adekoya and T. Adedoyin, "Encoding decoder discrepancy in emoji-based communication among youths on social media," *J. Language Technol.*, vol. 3, no. 2, pp. 44-61, 2024.
- [24] L. Gawne and G. McCulloch, "Emoji as digital gestures," *Language@Internet*, 2019, doi: 10.17169/langcog_2019.39.
- [25] S. A. Hayati and A. O. Muis, "Analyzing incorporation of emotion in emoji prediction," in *Paper Presented at the Proceedings of the Tenth Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis*, 2019. DOI: 10.18653/v1/W19-1311.
- [26] Y. Lim, K.-W. Ng, P. Naveen, and S.-C. Haw, "Emotion Recognition by Facial Expression and Voice: Review and Analysis," *Journal of Informatics and Web Engineering*, vol. 1, no. 2, 2022, Art. no. 4. [Online]. Available: <https://doi.org/10.33093/jiwe.2022.1.2.4>
- [27] M. Honkanen and J. Müller, "Interjections and emojis in Nigerian online communication," Wiley, 2021, DOI: 10.1111/weng.12544, pp. 1-20.
- [28] S. Loria, "TextBlob: Simplified Text Processing (0.16.0) [Python library]," Retrieved from <https://textblob.readthedocs.io/en/dev/index.html>, 2020.
- [29] S. A. Adeyemi and K. A. Bakare, "A survey of emoji misunderstanding among teenagers in Lagos State senior secondary schools," *Int. J. Adolescence Youth*, vol. 25, no. 1, pp. 1315-1329, 2022.
- [30] F. Al Rashdi, "Functions of emojis in WhatsApp interaction among Omanis," *Discourse Context Media*, vol. 26, pp. 117-126, 2018. DOI: 10.1016/j.dcm.2018.07.001.
- [31] L. Vidal, G. Ares, and S. R. Jaeger, "Use of emoticon and emoji in tweets for food-related emotional expression," *Food Quality and Preference*, vol. 49, pp. 119-128, 2016, doi:10.1016.
- [32] T. T. Gülşen, "You tell me in emojis," in *Computational and Cognitive Approaches to Narratology*, O. Ogata & T. Akimoto, Eds. Hershey: Information Science Reference, 2016, pp. 354-375.
- [33] W. Gibson, P. Huang, and Q. Yu, "Emoji and communicative action: the semiotics, sequence and gestural actions of 'face covering hand'," *Discourse Context Media*, vol. 26, pp. 91-99, 2018, doi: 10.1016/j.dcm.2018.05.005.
- [34] T. A. Daniel and A. L. Camp, "Emojis affect processing fluency on social media," *Psychol. Pop. Media Cult.*, 2018. DOI: 10.1037/ppm0000219.
- [35] S. Al-Azani, E.-S. M. El-Alfy, and IEEE, "Combining emojis with Arabic textual features for sentiment classification," in *Proceedings of the 2018 9th International Conference on Information and Communication Systems (ICICS)*, Irbid, 2018, doi: 10.1109/IACS.2018.8355456.
- [36] G. Beltrone, "Everyone is an emoji in this bizarre and terrifying French McDonald's ad," *AdWeek*. [Online]. Available: www.adweek.com/adfreak/everyone-emoji-bizarre-and-terrifying-french-mcdonalds-ad-166335.
- [37] C. J. Hand, K. Burd, A. Oliver, and C. M. Robus, "Interactions between text content and emoji types determine perceptions of both messages and senders," *Computers in Human Behavior Reports*, vol. 8, 100242, 2022. [Online]. Available: <https://doi.org/10.1016/j.chbr.2022.100242>.
- [38] M. Honkanen, *World Englishes on the Web: The Nigerian diaspora in the USA*, Amsterdam: John Benjamins, 2020.
- [39] G. Das, H. J. D. Wiener, and I. Kareklas, "To emoji or not to emoji? Examining the influence of emoji on consumer reactions to advertising," *J. Bus. Res.*, vol. 96, pp. 147-156, 2019, doi: 10.1016/j.jbusres.2018.11.007.
- [40] D. Rodrigues, M. Prada, R. Gaspar, M. V. Garrido, and D. Lopes, "Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions," *Behaviour Research*, vol. 50, no. 4, pp. 392-405, 2018, DOI: 10.3758/s13428-017-0878-6.
- [41] S. Suresh, "The influence of emojis on communication using social media- A quantitative study among college students of Mysuru," n.d.
- [42] F. W. Oreoluwa and F. O. Omotayo, "Use of Textism by University Students in Nigeria," *Covenant Journal of Informatics & Communication Technology*, vol. 10, no. 1, June 2022.
- [43] C. M. E. Halverson, C. E. Donnelly, M. Weiner, and J. L. Lee, "Content Analysis of Emoji and Emoticon Use in Clinical Texting Systems," *JAMA Network Open*, vol. 6, no. 6, June 1, 2023, e2318140. <https://doi.org/10.1001/jamanetworkopen.2023.18140>
- [44] T. S. Boender, N. Louis-Ferdinand, and G. Duschek, "Digital visual communication for public health: design proposal for a vaccinated emoji," *Journal of Medical Internet Research*, vol. 24, no. 4, 2022, e35786. <https://doi.org/10.2196/35786>
- [45] S. He, A. Renne, D. Argandykov, D. Convissar, and J. Lee, "Comparison of an emoji-based visual analog scale with a numeric rating scale for pain assessment," *JAMA*, vol. 328, no. 2, 2022, pp. 208-209. <https://doi.org/10.1001/jama.2022.7489>
- [46] M. D. Szeto, C. Barber, V. K. Ranpariya, et al., "Emojis and emoticons in health care and dermatology communication: narrative review," *JMIR Dermatol.*, vol. 5, no. 3, 2022, e33851. <https://doi.org/10.2196/33851>
- [47] N. Alshboul and L. Rababah, "The emoji linguistic functions on Facebook interactions among undergraduate students at Jadara University in Jordan," *Journal of Social and Educational Letters*, vol. 9, no. 1, 2021, p. 43. <https://doi.org/10.5296/jsel.v9i1.18486>
- [48] Grand Canyon University, "How Cellphones Affect Communication Skills," 2022. Retrieved from <https://www.gcu.edu/blog/gcu-experience/how-cellphones-affect-communication-skills> on June 29, 2022.

- [49] I. Boutet, M. LeBlanc, J. A. Chamberland, and C. A. Collin, "Emojis influence emotional communication, social attributions, and information processing," *Computers in Human Behavior*, vol. 119, 2021, 106722. <https://doi.org/10.1016/j.chb.2021.106722>
- [50] J. Callender, P. Bridge, F. Al-Samarraie, and D. Blair, "The use of emoji to establish student wellbeing: does the image reflect the reality?" *Journal of Radiotherapy Practice*, vol. 22, 2022, p. 704. <https://doi.org/10.1017/S1460396921000704>
- [51] J. Cui, "Respecting the old and loving the young: emoji-based sarcasm interpretation between younger and older adults," *Frontiers in Psychology*, vol. 13, 2022, 897153. <https://doi.org/10.3389/fpsyg.2022.897153>
- [52] E. A. Anaam, S.-C. Haw, K.-W. Ng, P. Naveen, and R. Thabit, "Utilizing Fuzzy Algorithm for Understanding Emotional Intelligence on Individual Feedback," *Journal of Informatics and Web Engineering*, vol. 2, no. 2, 2023, Art. no. 19. [Online]. Available: <https://doi.org/10.33093/jiwe.2023.2.2.19>
- [53] E. Ferrari, "The study of emoji linguistic behaviour: an examination of the theses raised (and not raised) in the academic literature," *Communication & Society*, vol. 36, no. 2, 2023, pp. 115-128.
- [54] G. Ares, L. Vidal, and S. R. Jaeger, "How do consumers use emoji in a food-related context? Insights for the design and interpretation of emoji questionnaires," *Journal of Sensory Studies*, vol. 36, no. 4, 2021. <https://doi.org/10.1111/joss.12663>
- [55] Y. Khalifa and A. Elnagar, "Sentiment Analysis of Colloquial Arabic Tweets with Emojis," *Advances in Intelligent Systems and Computing*, vol. 1339, 2021, pp. 418-430. https://doi.org/10.1007/978-3-030-69717-4_40
- [56] A. Shoeb and G. de Melo, "Assessing Emoji Use in Modern Text Processing Tools," in *59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing*, 2021, pp. 1379-1388.