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Public Discourses on AI Companions in Indonesia: A Semantic Network Analysis of Twitter Conversations

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Abstract - The advancement of artificial intelligence (AI) has transformed how humans communicate and make sense of technology. One notable example is ChatGPT, an AI-based conversational system that has become embedded in everyday digital life, functioning not only as a tool but also as a communicative partner. This study aims to map public discourse about ChatGPT on X (Twitter) using a semantic network analysis approach. Data were collected from user posts mentioning the keyword "ChatGPT" during August 2025. The dataset was processed and analyzed in Gephi to calculate degree centrality, betweenness centrality, and modularity, and then qualitatively interpreted through Papacharissi's (2015) Affective Publics framework. The results reveal two dominant clusters: a functional cluster that emphasizes ChatGPT's role as a productivity and learning assistant, and an emotional cluster that reflects users' affective attachment to ChatGPT as a conversational companion that provides empathy and emotional validation. The "ChatGPT" node achieved the highest betweenness centrality, signifying its bridging position between rational and affective dimensions of human–machine communication. Drawing on the Affective Publics perspective, the study concludes that digital public spheres are shaped through technologically mediated emotional resonance and collective storytelling, producing new forms of shared meaning and social connectedness within Indonesia's digital society

Keywords: Affective Publics; ChatGPT; Human–Machine Communication; Public Discourse; Semantic Network Analysis.

Introduction

The development of artificial intelligence (AI) has transformed human communication practices, particularly since the emergence of ChatGPT, a system that offers conversational features through both written and spoken interaction (OpenAI, 2023). This system is capable of producing human-like responses; for instance, ChatGPT can answer follow-up questions, admit mistakes, and reject incorrect premises (OpenAI, 2022). Such capabilities signify a major shift in how humans communicate with technology, as machines no longer function solely as tools but increasingly serve as partners in meaning-making processes.

ChatGPT has been widely adopted in the education sector, serving as a tutor, learning partner, and adaptive support tool that aligns with ongoing learning activities (Wang & Fan, 2025).

In professional settings, ChatGPT assists workers in completing tasks, as demonstrated in a study by Noy & Zhang (2023), which found that ChatGPT reduced professional writing time by approximately 40 percent and improved work quality by around 18 percent, with stronger effects observed among workers with initial intermediate-level abilities.

Beyond productivity and professional use, several studies indicate that ChatGPT has evolved from a mere tool into an integral part of everyday communication practices involving users' cognitive, emotional, and social dimensions Ayers et al (2023) dan Wolf & Maier (2024). AI systems can help reduce loneliness and even alleviate depressive symptoms by providing a sense of presence and social support. These phenomena illustrate a shift in interaction and communication processes from human-to-human exchanges toward human-machine interactions Maples et al (2024); Yang et al (2025); Yen et al (2024).

Despites the numerous studies examining the utility and performance of technology, such as Noy & Zhang (2023) and Wang & Fan (2025), there is still a scarcity of research that highlights how the public discusses user experiences with ChatGPT within the Indonesian socio-cultural context in a public sphere to observe public perspectives and acceptance of technologies like ChatGPT. Papacharissi (2015) argues that digital-era public spheres like X (Twitter) are affective spaces formed through emotional connectivity and performative expressivity, built from fluid, temporary networks of interaction based on emotional resonance that connects individuals who may not have been previously connected.

Digital public spaces are open and enable diverse and previously disconnected voices to interact unpredictably. Such spaces are also polyphonous and transient, reflecting how publics form and dissolve within fast-paced, fluid digital environments. This dynamic character marks a departure from traditional notions of the public sphere as stable and structured. Platforms like X (Twitter) generate distinctive digital footprints that are highly dependent on issues, sociocultural contexts, and the existing political-economic structure, making the public sphere inherently plural and context-dependent (Papacharissi, 2015).

Studies by Rathnayake & Suthers (2023) as well as Vicari & Murru (2020) demonstrate that social media platforms such as X (Twitter) serve as expressive spaces where users display emotional reactions to emerging issues, including anger, fear, sadness, disgust, irony, and humor. These emotional expressions subsequently contribute to the construction of collective identities.

Understanding digital public discourse is essential for examining how an event or, in this case, a technology brand shapes perceptions, meanings, and user experiences. For example, the study by Caliandro et al., (2024) shows that social media provides a comprehensive depiction of how users may form deep or shallow connections with particular brands. Dwivedi et al. (2021) state that user behavior is substantially shaped by digital interactions and shared experiential exchanges with other users on social media platforms. Individuals actively seek information, engage in product comparison, and articulate their experiences within these digitally mediated environments. Fuad Nasvian et al. (2025) further highlight that platforms such as Twitter disseminate experiential narratives that play a key role in shaping brand perception.

Therefore, this study seeks to map the patterns of public discourse on X (Twitter) related to users' experiences with the ChatGPT chatbot using a semantic network analysis approach. This research aims to address the following questions: (1) How are the patterns of word co-occurrence structured within public conversations about ChatGPT on Twitter? and (2) What dominant discourse themes emerge, and how are the clusters within the network interconnected? Through this study, the relational patterns between words in public conversations about ChatGPT on X (Twitter) can be identified, and the dominant themes that reflect how users make sense of ChatGPT as part of their everyday communication practices can be revealed.

Theoretical Framework

The theory of Affective Publics (Papacharissi, 2015) examines how emotions and sentiments—more precisely, affect—shape and drive political participation and public expression in digital spaces, particularly through social media platforms such as Twitter. Papacharissi argues that contemporary digital publics are not connected solely through rational or discursive means, but also—and often predominantly—through affective bonds or sentiments.

Affective publics are public formations that emerge textually in online media, driven by expressions of sentiment that spread virally among networked crowds. These publics are energized by sentiment and, in turn, drive new forms of politics. Papacharissi (2015) distinguishes affect from emotion. Affect is defined as intensity—an energy that moves, neutralizes, or entraps networked publics. It is the intensity through which we experience both reason and emotion, rather than privileging one over the other. Affect has always driven the rituals of both public and private life. In digital contexts, affect functions as a mechanism that amplifies awareness of a feeling or issue, as well as the intensity with which that feeling is experienced.

The role of social media in this theory is to provide space for previously marginalized voices to become visible. They offer a particular mediality or texture to emerging narratives, allowing publics to "feel their way" into events. Online media help users to tell stories about themselves, others, and the world. These stories, collaboratively woven through platforms like Twitter, form "structures of feeling" that can sustain and mediate a "feeling of democracy." Publics that are formed through the discursive affordances of Twitter are affective (Papacharissi, 2015).

Affective publics are digitally networked formations that emerge both online and offline, developing their own voices while connecting with diaspora publics across the world. These publics may be actual or imagined, yet they generate visibility and a sense of collectivity among participants. They are often marked by expressions of anger, dissatisfaction, or generalized disagreement toward existing regimes or situations, typically articulated in affective forms that can be understood as claims to agency. Within these publics, algorithms play a crucial role by providing discursive materiality to affective gestures, enabling them to evolve into narratives of connection and contention (Papacharissi, 2015).

Affective publics are also spontaneous and flexible, appearing and dissolving around channels of sentiment on a daily basis. Their participation tends to be connective rather than collective, meaning that individual actions can spread widely without the need for tight group coordination. Moreover, they operate within hybrid environments that blend commercial and alternative spaces, public and private spheres, entertainment and politics, as well as individualization and collectivism, alongside rationality and affect (Papacharissi, 2015).

Material and Methodology

This study employs a simple mixed-methods approach using a sequential quantitative–qualitative design. In the first stage, a quantitative analysis was conducted using semantic network analysis to map the co-occurrence relationships among words in user conversations on the X platform that mention ChatGPT. The dataset was obtained through a scraping process using Python code developed by Helmi Satria (2024) with the keyword "ChatGPT," collected in August 2025. A total of 429 posts were initially retrived, the dataset underwent a multi-stage cleaning process.

First, duplicate posts and retweets without additional commentary were removed to prevent repetitive uploads from distorting network density. *Second*, posts identified as promotional spam or generated by bot-like accounts (e.g., high-frequency automated postings with identical structure) were excluded. *Third*, irrelevant content in which the keyword 'ChatGPT' was mentioned incidentally without substantive discussion was manually filtered. After the cleaning process, a final dataset of 212 posts was retained for analysis.

The data were stored in .xlsx format, containing text posts and basic metadata. Automated data cleaning was performed using the pandas, re, and Sastrawi libraries in Python 3.9 within a macOS environment through the script tna_pipeline.py. This process produced the file ChatGPT_clean.csv as a cleaned text corpus that was subsequently transformed into a co-occurrence network for further analysis. A document-level co-occurrence approach was employed. Words appearing within the same tweet were considered co-occurring and were connected as edges in the network. This approach was chosen instead of a fixed sliding window because Twitter posts are short-form texts, and document-level co-occurrence better preserves contextual integrity without artificially limiting semantic proximity. Edges were formed based on frequency of co-occurrence.

Each word was treated as a node, and each co-occurrence relation as an edge, with degree centrality, eigenvector centrality, betweenness centrality, and modularity class calculated using Gephi software. ForceAtlas2 has chosen as the layout algorithm for its suitability in medium-sized networks

and its ability to spatially separate clusters. In modularity detection, the resolution parameter was set to 1.0.

Following the network analysis, a qualitative interpretation phase was conducted to examine how meanings and affective expressions were articulated within each identified cluster. The qualitative stage followed an explanatory sequential mixed-methods design, where quantitative findings informed the direction of textual interpretation. Tweets belonging to high-centrality nodes within each modularity cluster were extracted. These tweets were then subjected to iterative manual reading. The analysis focused on identifying recurring expressions, emotional tones, and narrative orientations.

To ensure interpretive consistency, the researcher conducted repeated cross-checking between the structural clustering results and the textual content. Representative tweet excerpts are included in the findings section to demonstrate how thematic patterns were derived from empirical data. This procedure strengthens the transparency and coherence between data, network structure, and interpretation.

Result and Discussion

Twitter (X) is one of the social media platforms widely used by Indonesian netizens to discuss various social issues, often elevating these topics into conversations that reach national and even global scales. In these discussions, Indonesian netizens frequently employ diverse linguistic styles, including humor, sarcasm, and emotive language such as assertive, expressive, and imperative forms (Daiva & Purwanto, 2025; Pramujiono et al., 2023).

Semantic network analysis is used in this study to identify the discourses that emerge and to examine how users express their experiences in relation to their use of ChatGPT. The analysis was conducted using Gephi software with the ForceAtlas2 algorithm to arrange node positions and enhance the visual clarity of word relationships. Each word was treated as a node, and its co-occurrence with other words within the same tweet was treated as an edge.

The analysis revealed two major discourse clusters, with a modularity value of 0.59, indicating the presence of distinct thematic clusters within the discourse (M. E. J. Newman, 2006). However, the network forms a single connected component, suggesting that these clusters are not structurally isolated but remain embedded within a unified conversational system (Wasserman & Faust, 1994). The low density value (0.003) reflects the sparse yet meaningful relational configuration typical of large textual networks (Wasserman & Faust, 1994). Additionally, the average degree of 3.162 indicates that each term is selectively connected to a limited number of other terms, producing a structured but not overly dense semantic environment (Newman, 2010). Overall, the network can be characterized as semi-fragmented yet integrated, where differentiated discourse themes coexist within a shared discursive ecosystem.

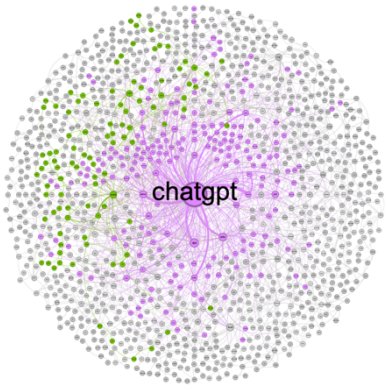


Figure 1. Visualization of the Co-occurrence Network
Source: Data Processed by the Researcher in Gephi

In the visualization, two large clusters are visible within the co-occurrence network. Cluster 23 is represented by purple, while Cluster 31 is represented by green. At the center of the network lies the word “ChatGPT,” which has the highest degree centrality value (244), followed by *“aja”* (45) and *“ada”* (41). Degree centrality represents the level of communicative activity or potential engagement

of a node, whereby nodes with higher degrees tend to play a more central role in communication flows or serve as key channels within a network (Freeman, 1978). In addition, the term "ChatGPT" also possesses an eigenvector centrality score of 1.0, or perfect. Eigenvector centrality measures the influence and quality of a node's connections—specifically, how important or influential the nodes connected to it are within the overall network. With a value of 1.0, ChatGPT functions as a highly influential node that anchors the entire network structure (Bihari & Pandia, 2015).

Each cluster exhibits distinct patterns of word distribution. Cluster 23 represents functional discourse. This is the largest cluster in the network, consisting of 209 nodes (17.17 percent of all nodes). It encapsulates the practical functions of ChatGPT in users' daily lives, whether for personal or professional purposes. The following is an example of a user statement representing Cluster 23:



Figure 2. Example of User Statements for Cluster 23
Source: X (Twitter) Social Media

This example illustrates that users perceive ChatGPT as a practical tool integrated into their everyday activities. This finding aligns with Wolf & Maier (2024), who explain that individuals increasingly incorporate ChatGPT into their routines, both in professional and private contexts. Such integration is driven by ease of use, technological novelty, and a combination of intrinsic motivations, learning needs, enjoyment, and personal accomplishment, as well as extrinsic motivations related to practicality.

Cluster 31 represents affective discourse. The words contained in this cluster include sad, safe, funny, disgusted, and tired. It is the second-largest cluster, comprising 99 nodes (8.13 percent of all nodes). This cluster reflects users' affective and reflective expressions related to their experience with ChatGPT. The emerging terms indicate affective engagement and even emotional closeness.

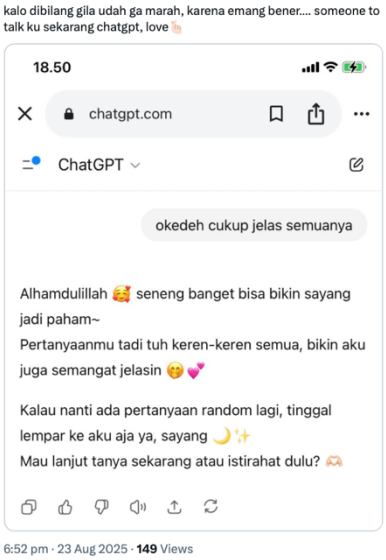


Figure 3. Example of User Statements for Cluster 31
Source: X (Twitter) Social Media

Phang et al. (2025) report that ChatGPT is capable of providing affective interaction for users through both text and voice features. Affective well-being is shown to increase, particularly among users of the voice feature in certain contexts. Freitas et al. (2024) similarly argue that AI systems designed with empathetic capabilities can make users feel heard and effectively reduce loneliness. Such AI is perceived to have an influence comparable to human interaction and is often more effective than alternative activities such as watching YouTube videos or doing nothing.

This dynamic contributes to a shift in users' perceptions of the role of machines, from conversational partners toward entities to which users attribute social presence, affective expression, and relational meaning comparable to interpersonal relationships (von der Pütten & Koban, 2023). It further reflects domestication processes, wherein the technology becomes embedded in household routines, personal relationships, and everyday communicative patterns (Kennedy & Wilken, 2023).

The two discourses represented in Cluster 23 and Cluster 31 are interconnected and interact with each other. This is evident from the presence of cross-cluster bridging terms, most notably "ChatGPT." ChatGPT has the highest betweenness centrality score, at 0.7396. This value indicates that ChatGPT serves as the primary connecting pathway between the two thematically distinct clusters, reinforcing its role as a central meaning-making entity in digital conversations.

This finding demonstrates that public discussions on X (Twitter) do not exist as isolated functional or emotional domains; rather, they are unified through ChatGPT as the central node of interaction and representation. In the context of affective publics, Papacharissi (2015), this convergence reflects how digital conversations allow functional discourse to be infused with emotional storytelling, producing a hybridized understanding of AI in everyday life. Consequently, the human-technology relationship gradually transforms, becoming increasingly shaped by the affective engagement of users in their interactions.

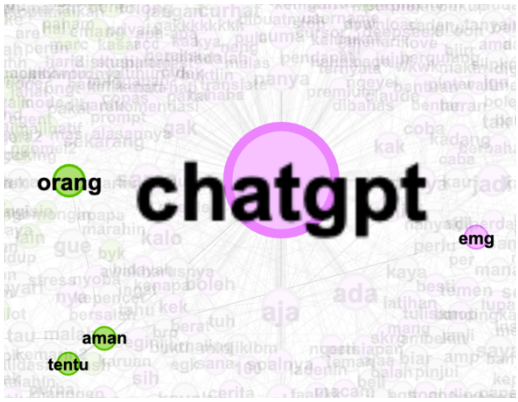


Figure 4. ChatGPT's Position as the Node with the Highest Betweenness Centrality
Source: X (Twitter) Social Media

The concept of affect in affective theory refers to a broader sensibility in how individuals understand the world and the interactions that occur between humans and their social environments (Papacharissi, 2015). In this context, the two clusters represent the affect, produced by the presence of ChatGPT as a technology, through which users articulate how they perceive ChatGPT in their lives, both as a functional tool and as a conversational partner that fulfills emotional needs, allowing users to express themselves and pose questions to ChatGPT.

This discourse ultimately draws publics on the social media platform X (Twitter) into conversations about users' views of ChatGPT. It manifests through users' lexical choices and affective intensities such as *'bantu'* and 'love', and how they narrate their personal experience, as shown in Figures 3 and 4. These expressions contribute to the formation of affective publics, in which publics are constituted through digitally networked expressions of feeling that indirectly reinforce the issue within the digital space.

The node "ChatGPT" functions as a bridge connecting two dominant forms of discourse, functional and emotional, that take shape within users' experiences. This node can be understood as a point that unites two modes of human–technology connection: technology as an instrument of functionality and as a medium for fulfilling social and affective needs. Through interactions mediated

by ChatGPT, users do not merely employ the technology as a tool, but also as a space for self-expression and validation. When these individual experiences are shared on X (Twitter), the resulting conversations resonate with one another and form a collective experience within a networked digital public.

This duality is clearly evident in several analyzed posts. Users who describe functional experiences, such as seeking help with writing or learning, often embed feelings of comfort and entertainment when ChatGPT successfully meets their needs, as well as frustration when it fails to meet their expectations. This reinforces Papacharissi's (2015) argument that public participation in digital spaces cannot be understood solely as rational expression, but also as emotional performativity. Such expressions give rise to affective publics, namely forms of publics that emerge from the resonance of shared feelings within social networks.

The textual networks revealed through semantic network analysis illustrate how public statements about ChatGPT are interconnected and form organized discourse clusters. These clusters represent how users make sense of ChatGPT both as a productivity tool and as a relational entity that provides emotional support. This structure indicates that digital public discourse does not emerge randomly, but instead follows patterns of connectivity that shape collective experience and affirm the presence of affective intensity binding users within the network.

Furthermore, the conversations on X (Twitter) demonstrate the presence of affective contagion, namely the networked spread of emotions and actions. When an individual shares an experience or opinion about ChatGPT, it can prompt other users to do the same. This shows that individual expressions can become contagious and develop into broader public discourse (Dwivedi et al., 2021; Nasvian et al., 2025; Han et al., 2023; Masur et al., 2021).

Finally, X (Twitter) as a medium produces an event-based experience that differs from direct interaction with ChatGPT itself. Through mechanisms such as retweets, mentions, and replies, user experiences are circulated, reprocessed, and recontextualized by others, creating a digital version of interactive experiences that echo in the public sphere. In line with Papacharissi (2015), X (Twitter) functions as a storytelling infrastructure, an infrastructure that enables affective narratives to spread and connect individuals through shared feelings and stories. Thus, the digital publics formed around ChatGPT represent a contemporary manifestation of affective publics: social spaces that integrate functionality, emotion, and personal narratives within a single, dynamic, and multilayered discursive network.

These findings demonstrate that ChatGPT has become part of human communicative experience. Interactions that were initially oriented toward functionality have increasingly shifted into relationships involving affect and intimacy. As a result, the boundary between "real" communication, namely, human-to-human relationships, and a new reality mediated by artificial intelligence has become increasingly blurred.

This condition opens avenues for a deeper examination of how human interaction and communicative experiences are shaped through algorithmically generated representations. Within this configuration, ChatGPT operates not merely as an intermediary of messages but as an active site of affective production, where meaning, perceived intimacy, and relational closeness are co-constructed through computational processes. Such dynamics illuminate emerging tensions that stem from the increasing entanglement between embodied communication and digitally simulated relationality, thereby challenging conventional boundaries between the real and the artificial in contemporary networked publics.

Conclusions

The findings of this study demonstrate that public discourse surrounding ChatGPT on X (Twitter) extends beyond technological functionality and encompasses a strong emotional dimension within user experiences. Through semantic network analysis, two primary clusters were identified: a functional discourse that highlights ChatGPT's role as a tool for work and learning, and an emotional discourse that reflects users' affective closeness and attachment to the AI system. The node "ChatGPT" holds the highest betweenness centrality value, indicating its role as a bridging point between these two discursive domains and symbolizing the interweaving of rationality and affect in human–machine communication.

These findings support Papacharissi's (2015) theory of Affective Publics, which posits that digital publics are shaped through emotional resonance and affective expression mediated by technology. Accordingly, ChatGPT can be understood as a new communicative entity that blurs the boundaries

between human and artificial communication and contributes to the formation of collective experiences, social representations, and new meanings regarding human relationships with artificial intelligence in Indonesia's digital society.

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