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The Role of Artificial Intelligence (Chat GPT) in the Development of Technology and Communication

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a r t i c l e i n f o

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a b s t r a c t

This research investigates the role of ChatGPT in human-machine communication, focusing on interaction attributes and user perceptions. The study employs qualitative methods, including interviews with ChatGPT users, word cloud analysis using NVivo 12 Pro, and observation of interactions. Results highlight five frequently occurring codes: "chat," "person," "ChatGPT," "task," and "communication." These findings suggest that ChatGPT is perceived both as a communicative tool and a communicative subject, with AI literacy being crucial for its effective use. The research contributes significantly to understanding the development of technology and communication, showcasing ChatGPT's potential to transform human-machine interactions. It demonstrates how ChatGPT can improve efficiency, creativity, and our understanding of artificial intelligence. The study also explores the comparison between human-human and human-machine communication, emphasizing the unique role of ChatGPT in modern communication dynamics. This research underscores the importance of integrating AI education into curricula and providing clear guidelines for ethical and effective use of AI technologies like ChatGPT.

Kata Kunci:
Kecerdasan Buatan; ChatGPT; Interaksi Manusia-Mesin; Teknologi Komunikasi; Literasi AI.

a b s t r a k

Penelitian ini menyelidiki peran ChatGPT dalam komunikasi manusia-mesin, dengan fokus pada atribut interaksi dan persepsi pengguna. Studi ini menggunakan metode kualitatif, termasuk wawancara dengan pengguna ChatGPT, analisis word cloud menggunakan NVivo 12 Pro, dan observasi interaksi. Hasilnya menyoroti lima kode yang sering muncul: "chat," "person," "ChatGPT," "task," dan "communication." Temuan ini menunjukkan bahwa ChatGPT dipersepsikan baik sebagai alat komunikasi maupun subjek komunikasi, dengan literasi AI menjadi faktor penting untuk penggunaannya yang efektif. Penelitian ini memberikan kontribusi yang signifikan dalam memahami perkembangan teknologi dan komunikasi, menunjukkan potensi ChatGPT untuk mengubah interaksi manusia-mesin. Ini menunjukkan bagaimana ChatGPT dapat meningkatkan efisiensi, kreativitas, dan pemahaman kita tentang kecerdasan buatan. Studi ini juga mengeksplorasi perbandingan antara komunikasi manusia-manusia dan manusia-mesin, menekankan peran unik ChatGPT dalam dinamika komunikasi modern. Penelitian ini menekankan pentingnya mengintegrasikan pendidikan AI ke dalam kurikulum dan memberikan panduan yang jelas untuk penggunaan teknologi AI yang etis dan efektif seperti ChatGPT.

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ACM Computing Classification System (CCS)
EBSCOhost
Communication and Mass Media Complete (CMMC)

1. Introduction

The development of technology has changed the way humans interact with their surroundings. One technological breakthrough that shakes the traditional paradigm is the presence of ChatGPT (Generative Pre-trained Transformer) in the world of computing [1]. With its ability to understand and respond to human language naturally, ChatGPT opens new doors in human-machine communication. This phenomenon becomes even more interesting when we see a significant surge in the ever-increasing use of ChatGPT, creating an increasingly dynamic and complex communication landscape. Although the use of ChatGPT has become an integral part of everyday life [1], there is an issue that needs to be examined. In the context of human interaction with ChatGPT, there is the potential for misunderstandings or mismatches in context understanding. This is evidenced by research conducted by statista.com.

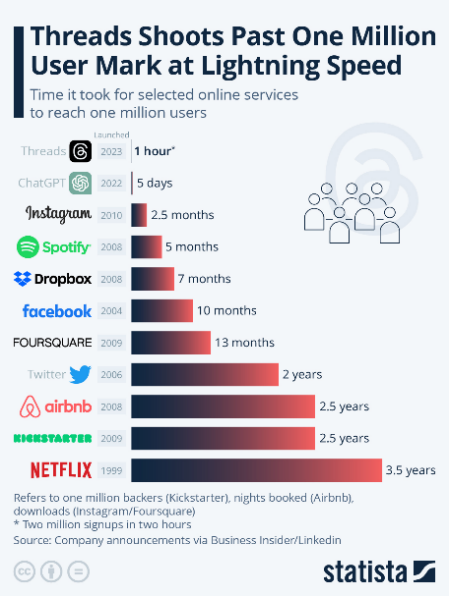

Figure 1. Time It Takes for Online Services to Reach 1 Million Users [2]

According to the data, ChatGPT is the second fastest digital platform to reach 1 million users in just 5 days. This shows that AI chatbots have become popular and widely accepted by society. ChatGPT also reached 1 million users faster than popular social media such as Instagram (2.5 months) and Facebook (10 months) [2]. The success of ChatGPT shows that AI is becoming an increasingly popular and widely used technology. Then, with this phenomenon as a representation of artificial intelligence, it is increasingly recognized as an entity capable of providing contextual and relevant responses. ChatGPT is no longer limited to entertainment purposes but extends to the professional, educational, and customer service domains. This phenomenon creates an environment where humans increasingly depend on technology to communicate and understand complex information [3]. Furthermore, the use of ChatGPT continues to grow, yet our understanding of human interaction with this technology still needs to be improved. Research gaps require further attention, particularly in identifying how humans interact with machines. The novelty of this research is key to understanding this technology's potential to meet user needs better. In exploring human interaction with ChatGPT, theories such as Human-Machine Communication (HMC), Media Equation, and Communicative Artificial Intelligence (CAI) become relevant. HMC theory highlights how humans communicate with machines, while Media Equation creates a foundation for understanding how humans can respond to computers as if interacting with fellow humans. The concept of CAI offers a viewpoint on how ChatGPT can be considered a subjective communication partner [4].

Against this background, this research investigates human interaction with ChatGPT, focusing on understanding context and developing more contextualized responses. Research questions that may be explored involve how humans interact with machines (ChatGPT) and what role ChatGPT holds in developing technology and communication. As such, this research aims to understand the rapidly growing phenomenon of ChatGPT usage and to fill the knowledge gap in human interaction with this artificial intelligence. Through this research, a strong foundation will be created to improve the user experience and utilize the full potential of this technology in supporting various aspects of human life.

Elements of Communication

According to Lasswell's model, communication has five elements that are interrelated with each other, namely "who says what in which channel to whom with what effect?" which means source, message, media, receiver, and effect. This model was proposed

by Harold Lasswell in 1948 which describes the communication process and the functions it carries out in society [5]. Lasswell's model can be applied to various types of communication, including interpersonal communication. In interpersonal communication, the source and receiver are individuals or small groups who know each other. Messages can be words, actions, or nonverbal expressions. Communication channels can be face-to-face, telephone, mail, or digital media. The impact of communication can be a change in attitude, knowledge, or behavior. Lasswell's model can help us to understand interpersonal communication better. This model can be used to analyze the elements of interpersonal communication and its impact.

Human Characteristics Toward Technology

Humans have various unique characteristics in interacting with technology. One of them is adaptability, where humans can learn and adapt to new technologies, understand new concepts, and integrate technology into their daily lives. In addition, humans also tend to become dependent on technology. Many people use technology in almost all aspects of their lives, from communication and entertainment to work and education [6]. Another characteristic is curiosity and innovation. Humans have a natural desire to understand and utilize new technologies, which often drives innovation and new inventions. Technology is also often used as a tool for social interaction. Whether through social media, email, or other communication
platforms, technology allows people to interact and collaborate with others [6].

Artificial Intelligence (AI)

Artificial intelligence (AI) is generally defined as the ability of computers to mimic human intelligence, but this definition is too broad and only covers simple computer applications. Another more specific definition is the technology that allows machines to mimic complex human skills, but this definition is still limited as it does not give a clear picture of how artificial intelligence is done clearly on what is meant by "complex human skills" [7]. An alternative approach to AI attempts to define AI as technology that "functions appropriately and with insight in its environment," or as the ability to "perceive, pursue goals, initiate actions, and learn from feedback." These task-based definitions provide a better understanding of AI, but still have limitations, especially in terms of the level of autonomy required [7]. The difficulty in defining AI is also related to the complexity of the concept of human intelligence that it seeks to emulate. With our knowledge of human intelligence still incomplete and with no consensus on what exactly constitutes human intelligence, it is difficult to describe how AI can mimic something that is not yet fully understood [8].

ChatGPT

ChatGPT is a chatbot implementation that uses artificial intelligence technology, specifically language modeling, developed by OpenAI. Its main function is to provide realistic and natural responses to various questions and commands from users. In addition, ChatGPT can generate text of various topics, styles, and lengths based on user instructions [9]. The applications of ChatGPT are diverse, ranging from answering difficult questions, completing tasks such as essays and mathematics, writing code, designing marketing strategies, creating cover letters, summarizing texts, to role-playing and designing sports training plans. In addition, ChatGPT can be an interactive companion in foreign language learning [10].

Moreover, ChatGPT is an interactive companion in foreign language learning, making it an invaluable resource for educational purposes. Its ability to mimic human conversation allows users to practice and improve their language skills in a conversational context. This adaptability highlights ChatGPT's potential to transform various sectors by enhancing productivity and facilitating learning. The broad applicability of ChatGPT extends into professional, educational, and personal domains. It can automate routine tasks, provide customer support, and enhance decision-making processes in professional settings. It acts as a tutor in academic contexts, assisting students with their homework and explaining complex subjects. Users can interact with ChatGPT for entertainment, companionship, or self-improvement purposes. The development and continuous improvement of ChatGPT illustrate the significant advancements in AI and natural language processing. It exemplifies how AI technologies can be integrated into daily life, enhancing efficiency, creativity, and interaction with digital tools. As AI continues to evolve, the capabilities of tools like ChatGPT are

expected to expand, further bridging the gap between human and machine interactions and providing more seamless and intuitive user experiences.

2. Research Methods

In this study, qualitative research methods grounded in the philosophy of postpositivism were employed to explore human interactions with ChatGPT. The research methodology was designed to investigate the functional aspects of communication between humans and ChatGPT through a comprehensive triangulation technique, which included observation, interviews, and documentation. This multifaceted approach ensured a robust and nuanced understanding of the phenomena under investigation.

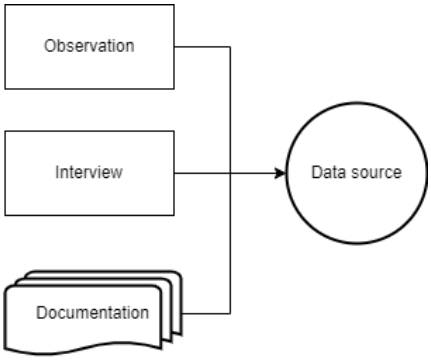

Figure 2. Triangulation Technique [11]

This research utilized qualitative methods based on the philosophy of postpositivism, exploring human interaction with ChatGPT. In collecting data, the researcher used triangulation techniques, including observation, interviews, and documentation, to investigate the functional aspects of such communication [11]. In this study, the subjects were Generation Z who actively interact with ChatGPT. The reason for choosing these subjects was because they have experience interacting directly with ChatGPT, so they can provide data related to communication between humans and ChatGPT.

The interview was designed to gain a deeper understanding of the interaction of students with ChatGPT, their understanding of this interaction, and their views on the role and function of ChatGPT in their everyday lives. The informants were asked to share their personal views on ChatGPT, tell about their first experience with it, and describe how their experience has evolved over time. Questions also included whether they felt like they were interacting with a human when using ChatGPT and what specific characteristics they found in the technology. In addition, questions explored the effects they felt after interacting with ChatGPT, whether there are human qualities in ChatGPT, and how the users direct conversations to achieve their goals. The last questions touched upon the users' preferences for ChatGPT, including gender, age, and other factors, as well as how far they feel ChatGPT can adapt to individual interaction styles.

Data analysis was conducted by utilizing the NVivo application, a specialized tool for qualitative data analysis, enabling the organization of categories, identification of patterns of findings, and structured presentation of results [12]. The application of NVivo was considered a strategic move, ensuring accuracy and cohesiveness in exploring the complexity of qualitative data arising from human interaction with ChatGPT. This research aims to understand meaning, explore uniqueness, and construct phenomena in the context of communication with artificial intelligence. Based on the philosophy of postpositivism, qualitative research provides space to detail the natural conditions of objects, where humans and ChatGPT are involved in the communication process. With a focus on inductive and qualitative analysis, this research aims to understand the complex phenomenon of human interaction with ChatGPT, creating a foundation for deeper understanding. It is hoped that the findings of this research will not only open insights into the functional aspects of communication but also stimulate the discovery of hypotheses that can develop our understanding of the dynamics of human interaction with artificial intelligence technologies.

3. Results and Discussion

The analysis of the data using NVivo 12 Pro yielded insightful results regarding the interaction dynamics and attributes of ChatGPT. The findings provide a comprehensive understanding of how ChatGPT is perceived and utilized by users, highlighting the multifaceted role of artificial intelligence in contemporary communication.

Results of Data Analysis with NVivo 12 Pro

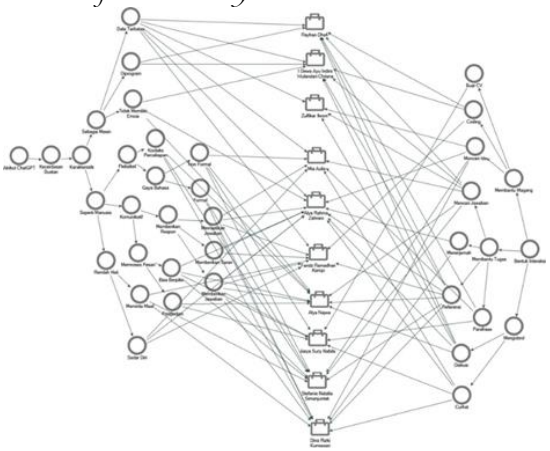

Figure 3. Visualization of Model Comparison Diagram ChatGPT

ChatGPT Attributes

In this study, the interactions between informants and ChatGPT illustrate diverse forms of engagement involving artificial intelligent machines. ChatGPT, as a machine, has attributes that include data limitations, programming, and emotionlessness. In the interviews, informants pointed out that ChatGPT's data is limited to 2021, indicating the limited availability of up-to-date information. It also highlighted that ChatGPT has been programmed in a way that allows it to process data taken from humans, stating that AI still has limitations in achieving human perfection and authenticity. Furthermore, the informant also stated that ChatGPT has no emotions. The informant expressed a crucial difference in this aspect, emphasizing that this machine is not capable of feeling or expressing emotions like humans. Collectively, these attributes describe ChatGPT as an entity without emotional experience, operated by preprogrammed data.

Interactions with ChatGPT

However, the research also illustrates how interaction with ChatGPT involves more complex and varied activities. Some informants used ChatGPT to assist with internship tasks, particularly in Curriculum Vitae (CV) creation and coding. They highlighted ChatGPT's ability to provide solutions and revisions, demonstrating a more active engagement in supporting daily work. In the context of coursework, several informants admitted that they used ChatGPT to look up answers, ideas, and even paraphrase. By utilizing ChatGPT's features, they found it easier to complete their academic assignments. In addition to helping with formal tasks, ChatGPT also engages in more informal interactions. Some informants described ChatGPT as a discussion buddy, capable of providing responses and even likened it to talking to a friend. The interaction reached a level where informants felt comfortable confiding in ChatGPT. With the various attributes and interactions outlined, this study provides a holistic picture of how ChatGPT not only serves as an assistive tool for formal tasks but also becomes an entity involved in social and emotional interactions in informants' daily lives. This underscores the increasingly dynamic and multidimensional role of artificial intelligence technologies in human-machine interaction.

Figure 4. Word Cloud Visualization of Research on ChatGPT

To explore the role of ChatGPT in the context of technological development and communication, a word cloud analysis was conducted to identify patterns of words that appear most frequently in interviews and related notes. Utilizing NVivo 12 Pro, word cloud analysis was conducted by extracting keywords from documents and interviews related to the use of ChatGPT. The five most frequently occurring codes, namely "chat," "people," "ChatGPT," "task," and "communication," became the main focus of this analysis. Through word cloud visualization, the pattern of these words can be identified.

Most Frequent Words: Chat

In the context of this research, the word "chat" takes center stage as it suggests that informal or conversational interaction is a major aspect involved in the use of ChatGPT. Users actively "chat" with ChatGPT, suggesting that it is not only used for formal purposes but also as a chat buddy or discussion partner. The word cloud visualization shows that the frequency of the word "chat" is a key point in

understanding how ChatGPT interacts with its users.

Most Frequent Words: People

Then, the word "people" appears as a significant element in the word cloud, characterizing that in the context of using ChatGPT, humans play a crucial role. Perhaps this word refers to the user who is interacting with ChatGPT or details how ChatGPT is used to understand and respond to questions or topics posed by humans. "ChatGPT" itself appears as one of the most frequent words, highlighting the centrality of this AI in the research. When seen together with other words, such as "chat" and "communication," it can be inferred that ChatGPT has a huge impact on its users' daily conversational and communication activities. Furthermore, the word "task" emerged as an important aspect, suggesting that users use ChatGPT to assist them in performing certain tasks. This may include document creation, idea generation, or even translation, as per the interview results of informants involved in internships and coursework.

Most Frequent Words: Communication

"Communication" emerged as a crucial keyword in cloud analysis, underscoring ChatGPT's significant role in facilitating user interactions. With its sophisticated ability to comprehend, respond to messages, and provide accurate answers, ChatGPT transforms into an active participant in human-machine communication. This pivotal role is highlighted by the comprehensive word cloud analysis conducted using NVivo 12 Pro, which paints a detailed picture of ChatGPT's influence on technological and communicative development.

The frequent appearance of keywords such as "chat," "people," "ChatGPT," "task," and "communication" in the analysis offers profound insights into the user experience. These keywords illustrate how users interact with ChatGPT for specific tasks and as a part of their daily communication routines. ChatGPT's integration into various communication activities demonstrates its versatility and essential role in modern technology usage. This research sheds light on the evolving dynamics of technology and communication. It shows that ChatGPT is more than a mere tool—it is a pivotal element in how humans engage with digital platforms. The analysis indicates that ChatGPT enhances user interactions by providing a responsive and adaptive communicative interface, thus facilitating more efficient and meaningful exchanges. The NVivo 12 Pro analysis findings affirm that ChatGPT has reshaped communication paradigms. It supports users in diverse contexts, from professional and academic settings to personal and social interactions. ChatGPT helps bridge the gap between human needs and technological capabilities by serving as both a communicative tool and a responsive entity. This dual role highlights its potential to foster a more interactive and intuitive user experience, which is critical for developing communication technologies.

Human-Human Communication Comparison with Human-Machine Communication

Table 1. Elements of Interpersonal Communication

Elements	Human-Human Communication	Human-Machine Communication
Source	Human	Human and machine
Message	Verbal and nonverbal (diverse)	Verbal and nonverbal (limited to emojis)
Media	(context-dependent)	Machine
Receiver	Human	Human and machine
Effect	Changes in the communicant's attitude, behavior, knowledge	For human: Changes in attitude, behavior, knowledge For machine: Change in interaction force

In communication between humans and humans, the process involves two parties interacting with each other. In interpersonal communication between humans and humans, the source of the message and the recipient of the message must be a human being [5]. This concept asserts that in every interpersonal

communication, there are at least two individuals involved in the message exchange. In contrast, when humans communicate with machines, at least one party in the interaction is a machine [13]. It is important to note that in human-to-human communication, various forms of messages can be encountered. In addition to verbal messages, nonverbal messages are also present involving various stimuli such as body language, touch, paralanguage, physical appearance, smell, orientation to personal space and distance, concept of time, silence, color, and artifacts [5]. This diversity arises because humans, as living beings, have feelings, thinking abilities, and five senses. This is what allows humans to provide and respond to various stimuli in the form of nonverbal messages [14].

On the other hand, in human-machine communication, machines are only equipped with artificial intelligence capabilities that allow them to respond to messages in text form [15]. While emojis can be considered a form of nonverbal communication, they are still sent by humans to machines in the form of text. ChatGPT, as a representation of artificial intelligence technology, not only acts as a medium but also functions as a communicator in the communication process. Machines, including ChatGPT, still function as mediators in human-technology interactions. It is worth emphasizing the importance of understanding the different ways to design technology, organize its functions, and understand the way people perceive and interact with technology to open a new understanding of human and machine interaction [13]. In the context of this study, the author argues that the role of ChatGPT involves two main dimensions, namely as a communicator and a medium. As a medium, ChatGPT acts as an intermediary in the communication process, allowing individuals to interact with machines through the ChatGPT application. Then, ChatGPT can be a communicator by generating contextually relevant and coherent text responses to user inputs, facilitating natural language-based interactions.

In addition, it is important to explore the effects of interpersonal communication, especially in the context of human-machine interaction. In this case, the effect of human-machine communication is a change in the response and interaction of the machine based on messages provided by the human. The content of the messages in this communication is highly dependent on the context and the data fed into the program. Machines, particularly artificial intelligence (AI), can learn from interactions with humans and adjust their responses accordingly. The result is an interaction that can feel personalized to humans. As such, this research illustrates that human-machine communication, particularly with ChatGPT, opens the door to new dynamics in how we interact with technology. By understanding the role and effects of this interaction, we can detail its impact on the development of technology and communication in the modern era.

Discussion

In terms of function, ChatGPT is not only a medium but also acts as a communicator [13]. This can be seen from the keyword "ChatGPT'" which reflects that ChatGPT acts as the subject in the communication process and as the communicated object. Furthermore, this research also involves analyzing the effects of human-machine interpersonal communication, specifically ChatGPT. The results indicate that the effects of this communication are changes in machine responses and interactions based on messages provided by humans. This is in line with the concept of machine learning and adaptation of AI to the preferences of its users, which creates a more personalized and relevant communication experience.

From the discussion of the research results and Nvivo 12 Pro word cloud analysis, it appears that ChatGPT plays a significant role in human interaction with technology. ChatGPT's success in adapting to user preferences, functioning as a medium, and playing a role in completing tasks has positive implications for the development of technology and communication. This research contributes to our understanding of how humans interact with artificial intelligence technologies, especially in the context of ChatGPT. By exploring the role and attributes of ChatGPT, this research can help further development in the field of artificial intelligence and understand its impact on human communication. While this study provides valuable insights, several aspects could be deepened for future research. First, further research could focus on the relational aspect of human interaction with ChatGPT, given the relationship that occurs between humans and machines in human-machine

communication. Second, involving a larger sample could provide a more comprehensive picture of users' perceptions of ChatGPT.

4. Conclusions

The research revealed that ChatGPT attributes, interaction dynamics, communication style patterns, the impact of interactions, and human perceptions of ChatGPT in the context of communication are key aspects underlying the communication process between humans and ChatGPT. The research findings also noted two main viewpoints regarding the role of ChatGPT in human communication. First, ChatGPT is considered as a communicative tool. That is, ChatGPT is used as a medium to interact and exchange information. The research highlighted that humans use ChatGPT as a tool to assist in daily tasks, guide in writing, and provide specific advice or information. Secondly, ChatGPT is seen as a communicative subject. This shows that there is an understanding that ChatGPT is not just a tool, but also has a role as an entity that can actively participate in interactions. Although programmed and emotionless, ChatGPT can provide relevant responses and impresses adaptability in answering users' questions or requests. It is important to note that communication between humans and ChatGPT has significant differences with human-to-human interaction. ChatGPT, as an AI, has unique limitations that set it apart from humans. While it can provide text responses, ChatGPT cannot achieve the level of empathy, personal experience, or subjective judgment that humans can in human-to-human interactions. The comparison between human-human and human-machine communication illustrates the machine as a unique communication partner. Machines function in the context of communication as partners that are limited to text responses and have dual roles as communicators and media. However, AI literacy is a critical factor in improving the effectiveness of human-machine communication. The complexity of the relationship between humans and technology is reflected in the limitations on ChatGPT's ability to feel empathy, understand personal experiences, and make subjective judgments. Therefore, a deep understanding of AI literacy is imperative to maximize the potential for productive interactions between humans and ChatGPTs. Overall, this research provides valuable insights into the role of ChatGPTs in communication, illustrates the complexity of human-machine interactions, and highlights the need to develop AI literacy as an integral part of the development of communication technologies.

A practical recommendation for advancing AI literacy involves integrating AI education into school and university curricula, covering fundamental AI understanding, ethical technology use, and human-machine interaction skills. Additionally, technology providers must offer clear resources and guidelines for the ethical and safe use of ChatGPT. This includes providing information on technology limitations, user privacy, and effective communication with AI. Encouraging open dialogue and public participation in the development and implementation of AI technology is essential. This fosters public awareness of technological impacts, enables valuable feedback, and ensures transparency in technology development. These streamlined practices aim to guide the development of AI literacy and ensure the ethical and wise use of communication technology in everyday life.

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