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IMPACT OF AI TECHNOLOGY ON SOCIAL COMMUNICATION: MEDIATING ROLE OF ICT LEARNING AND SELF-EFFICACY AND AI EMOTIONAL CREEPINESS AS MODERATOR

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Abstract
This study examine the impact of artificial intelligence (AI) technologies on social communication, self-efficacy, ICT learning and emotional responses among employees in the Kingdom of Saudi Arabia. It aims to understand how AI influences workplace interactions, individual confidence, and emotional perceptions, contributing to the growing discourse on AI's role in organizational settings.The research employed a quantitative approach, collecting data from 263 employees across diverse firms in Saudi Arabia. Established scales from previous research were utilized to measure key constructs, including the influence of AI technology, self-efficacy, information and communication technology (ICT) learning, AI emotional creepiness, and social communication. The data were analyzed using partial least squares structural equation modeling (PLS-SEM) to validate the measurement model and test the hypothesized relationships. The results reveal that AI technologies significantly enhance social communication and self-efficacy, with ICT learning mediating these effects. AI emotional creepiness moderates the relationship, indicating the nuanced emotional impact of AI on workplace dynamics. These findings highlight the dual role of AI in fostering collaboration and triggering emotional apprehensions. This study contributes to the limited empirical research on AI's multifaceted effects in organizational contexts, offering valuable theoretical insights and practical recommendations for leveraging AI technologies to improve workplace efficiency while addressing employee concerns.

Keywords: The influence of AI technology, Self-efficacy, Information and communication technology learning, AI emotional creepiness, Social communication.

1. INTRODUCTION

Rapid changes in Artificial Intelligence (AI) have drastically altered the way people and institutions communicate in various contexts. AI technologies, from chatbots to sentiment analysis tools, are increasingly being integrated into social communication platforms that offer efficiency, scalability, and personalization (Ho et al., 2024). The introduction of AI in communication is not only a technological change but also a social change that redefines the human interaction dynamics (Duong et al., 2024). Traditionally, communication has been a very human process of establishing connections and passing information (Seberger et al., 2024). However, machine learning and natural language processing have introduced new paradigms in how people carry out conversations and interpret meanings (Markus et al., 2024). From helping people work better together at work to supporting customer engagement, AI has become an essential part of the evolution of communicative practices (Polyportis, 2024). AI-based communication tools are programmed to mimic human-like conversation; thus, there are emergent opportunities for efficiency and understanding (Kim & Baek, 2023). For example, AI-driven sentiment analysis unravels the emotions of the message so that business organizations may effectively respond to customer requirements (Neugnot-Cerioli & Laurenty, 2024). However, these new advantages are not free of concerns; there is an inherent mistrust in terms of privacy and the emotional validation of AI-driven communication interaction (Salah et al., 2024). Therefore, differences pointed to an ever-growing need to analyze the impact of AI on social communication in order to count opportunities and challenges of the new arena.

Over the past ten years, empirical studies on AI and social communication have grown in number in reflecting the importance of the field (Shahzad et al., 2024). AI technologies have increasingly become renowned because they enhance communication and create good experiences among the users (Pervez et al., 2024). According to Kang et al. (2024), it has been proved that the effectiveness of customer service would improve in relation to the use of chatbots. Similarly, Gao et al. (2024) revealed how AI-based sentiment analysis tools helped companies understand the emotions of the customers, which were then customized marketing strategies. Organizational settings make communication easier with AI tools by automating routine work and establishing real-time communication through virtual assistants (Newman et al., 2024). More studies on the effect of AI have been further studied on interpersonal communication. For example, social media platforms use AI algorithms to suggest connections and personalize content for users, which increases the engagement of users (McLean et al., 2024). In education, AI tools such as adaptive learning platforms have helped students and teachers in virtual communication environments (Zhou et al., 2024). In healthcare, AI-based communication assistants have enhanced patient-provider communication, especially in telemedicine. Nevertheless, all research findings cannot be universally positive. Evidence suggests that users might find AI to be unsettling or suspicious when AI speaks with the fluency of humans (Cintamür, 2024). Lastly, the fears about the violation of users' privacy and loss of control over data are continuously reported where AI applications analyze users' sensitive data (Dadwal et al., 2024). Despite promising conversions of social communication, these changes attest to the necessity of balanced AI adoption with greater care in its ethical implications.

Although numerous research studies have taken place, considerable gaps remain with respect to the complete potential impact of AI on social communication (Jiang et al., 2024). This significant gap includes inconsistent appraisals of user acceptance of AI technologies. While some pieces of literature emphasize the utility of AI in creating efficiency in communication, others relate emotional and ethical challenges users must deal with (Sullivan et al., 2023). This is not an indication of agreement;

therefore, there is a call for more studies that are needed to diversify user experiences and contexts (Tlili et al., 2023). Research is also restricted to work that has largely focused on technological factors on AI communication tools and less the socio-emotional influences on their effectiveness (Jin & Youn, 2022). More critical is the gap in mediating and moderating variables influencing AI's impact on outcomes of communication. For example, although self-efficacy has been shown to be one of the most influential factors determining technology adoption, there is still very limited research on its effects on AI-driven social communication (Mariani et al., 2023). Although user engagement in AI technologies due to ICT learning is argued in literature, the exact mechanism to enhance the outcomes of communication is vague (Lee et al., 2023). Moreover, the phenomenon of AI emotional creepiness, which refers to the user's unease in human-like AI behavior, has been rarely studied in the empirical research (Köchling & Wehner, 2022). This phenomenon can make a significant difference in the effectiveness of AI on social communication, but such research is still scarce (Yin et al., 2023). The gaps above should be filled to develop holistic understanding of AI's role in changing social communication dynamics.

The objectives of the study are constructed to address some of the outlined gaps in researching and advancing what AI means to social communications. A more critical objective is to research how exactly AI technologies, through specific tools such as chatbots and sentiment analysis systems and automated translators among others, would impact the efficiency of communication and a user's experiences. Another important objective of this research is to explore the mediating role of self-efficacy in the relationship between AI technology and social communication. The focus should be on how people's sense of confidence influences their outcome while using the AI tools (Heyder et al., 2023). In addition, the study will find out how learning with ICT influences users' technology engagement through technical proficiency. This study aims to shift attention towards the significance of education and training in enhancing the potential of AI tools by showing the relationship between ICT learning and communication outcomes (He & Zhang, 2022). Along with this, this research also discusses how AI emotional creepiness acts as a moderator by elaborating how the aversion of users toward human-like behavior of AI impacts the perception and adoption of AI technologies among the users (Chandra et al., 2022). The research questions are construed to throw light upon these relationships and yield practical implications for the improvement of AI-driven communication.

This study will be very influential to the academy and practice through its contribution to the application of practical knowledge in AI-driven social communication. This study will fill literature gaps that give a nuanced understanding of how these AI technologies affect communication dynamics. Its results will be used to develop user-centric AI tools to enhance the positive outcomes and minimize ethical and emotional concerns. In addition to that, this research has practical implications in the customer service, education, and health care industries where communication is key. The findings also benefit policymakers and designers who seek insight into how to design AI systems that find a balance between technological innovation and human values (Kumar et al., 2022).

This study is rooted in Social Cognitive Theory as it explains how human behavior happens through interaction among cognitive, behavioral, and environmental factors (Flavián et al., 2021). It centers on the concept of self-efficacy, that explains how a person believes in one's capability to apply AI tools and change their communication experiences. The theory supports the hypothesis that the higher the self-efficacy, the better engagement with AI technologies will lead to enhanced communication outcomes (Chi et al., 2020). Furthermore, the Unified Theory of Acceptance and Use of Technology (UTAUT) provides a framework where performance expectancy and social influence factors drive the adoption of AI tools. The theory of UTAUT is supported by ICT learning, as it considers

technical knowledge and training to determine the acceptance of technology by the users (Moore et al., 2022). Besides that, AI emotional creepiness is based on Affect Theory that explains how the user experience is influenced by responses towards the emotional side of AI behavior (Yang et al., 2021). Taken together, the theoretical backgrounds provide an all-around framework for studying how AI technologies interplay with self-efficacy, learning in ICT, and emotional perceptions in social communication. Through this integration, this research is going to further an overall insight into how AI influences the course of communication and what recommendations it should be taken into implementation in an evidence-based manner.

2. LITERATURE REVIEW

Artificial Intelligence (AI) has had a very powerful influence on social communication. AI in the social communication platforms has enriched interpersonal as well as organizational communication by allowing the inclusion of tools such as chatbots, virtual assistants, or fully automated translation systems for interaction (Yu & Li, 2022). Tools driven by AI sentiment analysis can interpret emotional cues that will help businesses understand what customers want and enable the companies tailor their communication strategy accordingly (Moore et al., 2022). AI algorithms curate content in social media, analyze trends, and create connections between people of common interest, making the digital space more engaging (Flavián et al., 2021). According to research, it has been observed that there is a growing reliance on AI technologies for predictive communication wherein the machine learning models study the past interactions to predict future needs of communication (Chandra et al., 2022). Predictive capability not only enhances responsiveness but also generates a sense of personalization that can make interpersonal and organizational relationships stronger (Heyder et al., 2023). The fast-emerging role of AI in communication raises important questions about ethics, privacy, and eventually, the dilution of human-centered relations (Köchling & Wehner, 2022). These critics, therefore, argue that an overreliance on AI tools may create communication devoid of empathy and emotional intelligence, among its core virtues to affirm genuine relationships (Mariani et al., 2023). Though AI-based content moderation systems are efficient in handling inappropriate or even harmful content, an argument about freedom of expression and bias through algorithms has emerged as AI becomes more widespread and pervasive (Tlili et al., 2023). The role played by AI in defining social mores and communication practices will be more apparent as this becomes more widespread and should then be balanced against the benefits and potential negative effects (Jiang et al., 2024). Researchers have called for robust frameworks to regulate AI's role in social communication, ensuring transparency, accountability, and ethical standards to preserve the very essence of human interaction in an increasingly AI-driven world (Cintamür, 2024).

3. HYPOTHESIS DEVELOPMENT

AI technology has come forward as the transformer of the improvement of social communication using the most innovative tools and solutions in interpersonal and organizational contexts (Zhou et al., 2024). It is stated that how tools, developed by AI, including chatbots, virtual assistants, and voice recognition systems, can enable efficient real-time communication for customer care services and professional usage (Newman et al., 2024). AI-based social media algorithms help in content personalization, enabling users to interact more effectively with what suits them (Kang et al., 2024). The platforms also work according to machine learning algorithms. They suggest people

to recommend, hence forming groups of peoples with similar interests. In educative and health contexts, AI communication devices have improved engagement owing to adaptive answers and discourses in virtual environments as well (Shahzad et al., 2024). Although beneficial, studies also caution that this could lead to problems in terms of diminished human authenticity and the danger of communicative overmechanization, which can potentially weaken emotional understanding and relational depth (Neugnot-Cerioli & Laurenty, 2024).

The impact of AI on social communication is found to change both the process as well as the outcome in a conversation (Polyportis, 2024). It empirically gets reported that adaptability, as well as forecasting ability through AI, helped enhance communication quality and reduced time involved in communication (Seberger et al., 2024). Even in today's world, communication takes place with contextual awareness only where the method of communication takes place because of meaning resulting from communicating and not using communication individually (Ho et al., 2024). Moreover, automated language processing tools such as translation software have crossed cultural and linguistic boundaries to facilitate unprecedented global connectivity (Duong et al., 2024). With increasing sophistication in AI technologies, their ability to simulate human-like modes of conversation has put them in a key enabling role in modern communication that justifies the thesis that AI hugely impacts social communication.

H1: The influence of AI technology significantly influences the social communication.

Self-efficacy is defined as the belief within one's ability to perform a task. It is seen that self-efficacy plays a fundamental role in adopting new technologies, specifically in complex communication environments (Markus et al., 2024). Self-efficacy, relates how it enhances confidence and resistance in adopting innovative tools. Among these innovative tools includes the AI technologies. Empirical studies have demonstrated that users with high self-efficacy are more likely to interact constructively with AI-based services by using the features for communicating (Kim & Baek, 2023). Organisational contexts have also illustrated that the implementation of AI tools with friendly user interfaces and supportive feedback systems is positively related to enhanced self-efficacy at work, which consequently influences better teamwork and decision-making by employees (Salah et al., 2024). Conversely, low self-efficacy causes resistance in users towards AI technologies because it could hinder effectiveness in communication (Pervez et al., 2024).

The mediating function of self-efficacy in the AI technology and social communication relationship results from its influence on the engagement of users (Gao et al., 2024). The high self-efficacy individuals view AI tools as facilitators rather than as inhibitors, thus encouraging more active participation in communication (McLean et al., 2024). AI affords adaptive learning environments and immediate feedback to heighten user self-efficacy by providing assurance about one's abilities in communicative competence (Sorosrungruang et al., 2024). For example, AI-based interactive training modules at the workplace have been found to develop self-efficacy that promotes more effective and meaningful interaction (Dadwal et al., 2024). A positive attitude toward technology that develops self-efficacy can promote the adoption of AI, which strengthens its influence on social communication, confirming the mediating role (Sullivan et al., 2023).

H2: Self-efficacy significantly mediates the relationship of the influence of AI technology and social communication.

Integrating learning for information and communication technology has always been the bedrock to understanding how adoption and usage occur for AI technologies (Jin & Youn, 2022). The acquisition of ICT knowledge would grant the individual technical capability and assurance in engaging appropriately with AI-empowered platforms as reflected by studies from both educational

and organizational sectors (Lee et al., 2023). Research has shown that formal ICT training programs help users to better utilize AI tools, which will result in better communication outcomes at work and in life (Yin et al., 2023). In addition, learning ICT develops a sense of flexibility, making users adopt changing AI technologies for better collaboration and connectivity (He & Zhang, 2022). However, gaps in learning about ICT have often exacerbated digital divides and reduced the reach and effectiveness of AI-based communication tools (Kumar et al., 2022).

ICT learning acts as an intermediary between AI technology and social communication, because it fosters an increased appreciation of the capabilities and applicability of technology (Chi et al., 2020). This way, ICT training makes knowledge and skills available to be used more fruitfully for AI to execute enriched communication experiences-from run-of-the-mill self-service interactions to complex, situation-driven conversations (Yang et al., 2021). Evidence from research points out that an organization, which invests in learning initiatives for ICT, would find a positive impact on its employee performance, specifically on roles that are communication-intensive because of increased proficiency in AI tools (Ho et al., 2024). Since AI continues to revolutionize the way people communicate, ICT learning fills the gap between the technology and user efficacy, and thus confirms its mediating role in the relationship (Markus et al., 2024).

H3: Information and communication technology learning significantly mediates the relationship of the influence of AI technology and social communication.

The AI emotional creepiness, then, refers to the discomfort users feel when an AI system expresses human-like emotions (Neugnot-Cerioli & Laurenty, 2024). Researches recently indicated that such anthropomorphic interactions with an AI may give rise to feelings of distrust and unease in users, especially within the emotionally authentic context (Pervez et al., 2024). For example, in customer service, sometimes empathy-engineered chatbots have been perceived as overbearing, which creates a user experience that is not desired (Newman et al., 2024). In addition, the perception of AI emotional creepiness is both cultural and individual; in fact, whereas some people embrace anthropomorphism, others detest it. This is the complexity of engaging emotional intelligence into AI tools, crossing a threshold of user comfort levels.

This would translate to the influence exerted by AI emotional creepiness as moderation in how users understand and interact with AI technologies when applied in communication contexts (Jiang et al., 2024). User engagement is said to be inversely proportional when one deems AI as emotionally creepy; thereby the intended positive influence exerted by AI on social communication diminishes (Jin & Youn, 2022). When emotions, however, are presented properly to match users' perceptions, AI facilitates further increases in the relationship depth and interaction quality (Köchling & Wehner, 2022). For example, it has been observed that AI systems that balance empathy with professional detachment are more likely to be better accepted in settings such as healthcare and customer service (He & Zhang, 2022). In this regard, the perception of emotional creepiness acts as an important moderating factor that determines the degree to which AI informs social communication.

H4: AI emotional creepiness significantly moderates the relationship of the influence of AI technology and social communication.

3.1 Theoretical Support

The research framework is considered in light of the Social Cognitive Theory, which holds the position that cognitive, behavioristic, and environmental causes influence human behavior (Flavián et al., 2021). For instance, it supports the suggestion that technological factors, like artificial intelligence, have a paramount effect on social communication among the users by making a better capacity and reshuffling the patterns of interaction (Yang et al., 2021). In self-efficacy, one mediator construct

within Social Cognitive Theory, belief in one's capability contributes to increased involvement with AI technologies (Kumar et al., 2022). Similarly, knowledge acquisition and adaptability that make up the focus of ICT learning motivators fit well within the framework for behavioral outcomes (Heyder et al., 2023). An environmental and contextual influence suggests the moderation impact of AI emotional creepiness in determining user perceptions and interactions with technology (Lee et al., 2023). Together, these constructs would provide an all-embracing explanation of dynamic relationships between AI, self-efficacy, ICT learning, and social communication. This would therefore shape a theoretical foundation that is more robust for the research model.

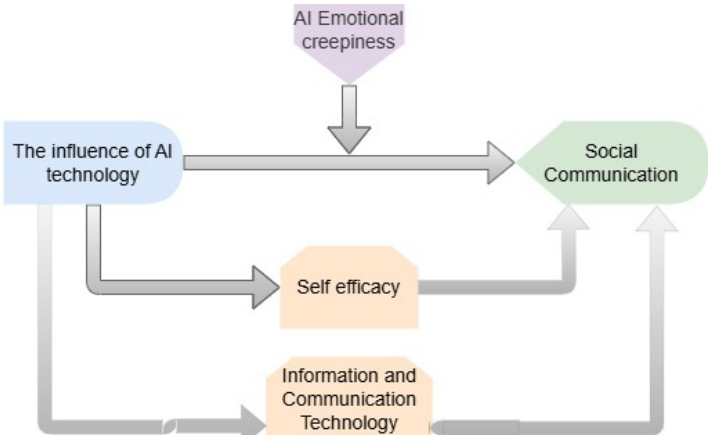

Figure 1: Theoretical Model

4. METHODOLOGY

4.1 Research Context and Design

This research was conducted within the Kingdom of Saudi Arabia, whose region is characterized by high-speed technological developments and growing infusions of artificial intelligence into organizational life. The purpose was to examine the effects that AI technology has on social communications, self-efficacy, and feelings among employees. A quantitative research approach was therefore used to provide a set structure for objective analysis into the relationships in question.

4.2 Sample and Sampling Procedure

This research targeted employees from organizations from across Saudi Arabia. Utilizing a stratified technique for random sampling, which selects participants from different organisational sectors and job design, resulted in the selection of 263 participants. The sample size was considered to be sufficient based on the established guidelines for partial least squares structural equation modeling (PLS-SEM), which recommends at least 10 times the number of indicators for the most complex construct in the model. The participants were employees with different levels of exposure to AI technologies, from entry-level staff to managerial positions. This diversity ensured that the research could cover an all-rounded effect of AI on social communication and self-efficacy. Pre-testing informed the respondents of the purpose of conducting the research and assured them of the confidentiality of their answers to guarantee candid response.

4.3 Instrumentation and Measures

The study made use of scales developed earlier in related research works as instruments of measuring the constructs to ensure reliability and validity (Table 1). A scale has been used to measure the influence of AI technology in capturing perceptions towards AI's societal and educational benefits with its transformative potential. It measured self-efficacy using a widely established 10-item scale evaluating levels of confidence that people could handle challenges and accomplish tasks. For ICT learning, it has considered a scale focused on participation and enjoyment in the deployment of AI tools in the working environment. AI emotional creepiness was assessed through items as concerning and fear-provoking over AI technologies. Social communication was assessed through a wide-ranging scale, including the evaluation of different aspects of how people interact in conversation, conversational initiative, adherence to conversational rules, and group interaction. All the items were measured on a five-point Likert scale from "strongly disagree" to "strongly agree." Using well-known scales allowed the results to be comparable with earlier studies and strengthened the reliability of the measurement model.

Table 1: Instrumentation

Variable	Items	Source
The influence of AI technology	8	(Lee, 2024)
Self-efficacy	10	(Bonsaksen et al., 2013)
Information and communication technology learning	7	(Wael Sh, 2024)
AI emotional creepiness	4	(Polyportis, 2024)
Social communication	20	(Weber et al., 2021)

4.4 Data Collection

Data was collected over a period of two months, with the help of an online survey sent via email and organizational networks. The survey was user-friendly with clear instructions and logical flow for easy completion. The respondents were assured that their responses would be candid, and follow-up reminders were sent to increase the response rate.

4.5 Data Analysis

All collected data were analyzed through partial least squares structural equation modeling, which is a powerful statistical technique appropriate for both predictive and exploratory research. Such a technique was purposely used in this study because it can handle complex models that may have multiple constructs, and it has the ability to handle non-normal data distributions. The analysis was in two stages. First, the measurement model was analyzed to ascertain the reliability and validity of the constructs, including the assessments of Cronbach's alpha, composite reliability, and AVE. Following this, the structural model was analyzed for the testing of the proposed hypotheses based on the examination of path coefficients, t-statistics, and p-values for ascertaining whether strength and significance are available between the variables in consideration. The fit of the model was further examined through R-squared values, predictive relevance (Q^2), and effect sizes (f^2). In this way, the methodology guaranteed an investigation of the research objectives in a comprehensive and rigorous manner, thus providing valuable insights on the influence of AI technologies regarding employee communication, efficacy, and emotional experiences in the Saudi organizational context.

5. RESULTS

The variables' reliability and validity were evaluated using Cronbach's Alpha; see table 2, Composite Reliability (CR), and Average Variance Extracted (AVE). All the constructs attained acceptable levels of reliability and validity. The impact of AI technology reached a very high Cronbach's Alpha (0.906) and CR (0.924), with an AVE of 0.604, thus ensuring strong internal consistency and convergent validity. The factor loadings of all items were strong, between 0.731 and 0.808, with great construct and item congruence. Cronbach's Alpha, CR, and AVE were 0.890, 0.910, and 0.503, respectively; the former two scores slightly lower than the preferable, though not in a poor order of above 0.5. Loadings ranged between 0.651 and 0.761 for moderate strength; self-efficacy scores proved overall reliable.

Table 2: Variables reliability and validity

Variables Factors	Loading	Cronbach Alpha	Composite Reliability	AVE
The influence of AI technology		0.906	0.924	0.604
AI will change society.	0.793			
AI will be beneficial to society.	0.795			
AI will transform education.	0.752			
AI will be beneficial for education.	0.778			
Big data will change society.	0.731			
Big data will be beneficial to society.	0.808			
Big data will transform education.	0.754			
Big data will be beneficial for education.	0.806			
Self-efficacy		0.890	0.910	0.503
I can always manage to solve difficult problems if I try hard enough	0.689			
If someone opposes me, I can find the means and ways to get what I want	0.712			
It is easy for me to stick to my aims and accomplish my goals	0.674			
I am confident that I could deal efficiently with unexpected events	0.761			
Thanks to my resourcefulness, I know how to handle unforeseen situations	0.749			
I can solve most problems if I invest the necessary effort	0.692			
I can remain calm when facing difficulties because I can rely on my coping abilities	0.713			
When I am confronted with a problem, I can usually find several solutions	0.714			
If I am in trouble, I can usually think of a solution	0.651			
I can usually handle whatever comes my way	0.728			
Information and communication technology learning		0.862	0.897	0.593
The more often I use AI tools at work, the more I enjoy my tasks.	0.814			
The more I engage with AI-based systems at work, the more motivated I feel.	0.803			
I find learning new AI-based technologies and systems interesting.	0.814			
AI technologies provide me with opportunities to learn and apply new skills.	0.742			
I enjoy discovering new AI innovations in the workplace.	0.694			
The more I use AI-based systems, the more confident I feel in my work tasks.	0.748			
Frequent use of AI at work increases my interest in applying new technologies.	Dropped			
AI emotional creepiness		0.870	0.816	0.527
When using ChatGPT as a student I feel uneasy.	0.761			
When using ChatGPT I have an indefinable fear.	0.759			
When using ChatGPT I have a queasy feeling.	0.703			
When using ChatGPT I somehow feel threatened.	0.676			
Social communication		0.890	0.907	0.595
Starts a conversation by himself/herself (shows communicative initiative).	0.581			
Enjoys communicating with other clients/peers.	0.643			
Enjoys communication with caregivers.	0.610			
Enjoys communication with strangers.	0.658			
Communicates with many different clients/peers.	0.638			
Can stay in a longer two-way conversation (over 5min).	0.628			
Adheres to conversational rules (e.g., can wait for his/her turn).	0.587			

cont...

Picks up on the interlocutor's contribution to the conversation and responds to it.	0.683
Stays on topic with his/her contributions to the conversation.	0.545
Tells others things they already know or don't care about.	0.657
Asks when he/she does not understand.	0.624
Can conduct a balanced conversation (send–receive).	0.558
Participates in group conversations with other clients/peers.	0.748
Involves himself/herself actively in group conversations.	0.595
Asks specific questions in group conversations.	0.647
Enjoys expressing himself/herself in front of a group.	Dropped
Gives other clients/peers positive feedback/compliments and expresses appreciation through signed/spoken communication.	Dropped
Communicates the offer of assistance to other clients/peers.	Dropped
Uses eye contact and facial expressions appropriately.	Dropped

Cronbach's Alpha and CR for ICT learning were 0.862 and 0.897, respectively, with an AVE of 0.593. One item was dropped because of insufficient loading, and this improved the overall reliability and validity of the construct. Factor loadings ranged from 0.694 to 0.814, indicating a reliable measure of ICT learning experiences. Cronbach's Alpha of AI emotional creepiness was 0.870, CR 0.816, and AVE was 0.527. The factor loadings were ranging between 0.676 to 0.761. All these values reflect adequate reliability but point to some concerns that might be considered to be at the moderate level for the emotional discomfort triggered by AI technologies, such as ChatGPT. The last scale was Social Communication, with Cronbach's Alpha equal to 0.890, CR was 0.907, and an AVE equal to 0.595, showing a strong construct. However, several items were dropped owing to low factor loadings, leading to an improvement in overall reliability and validity.

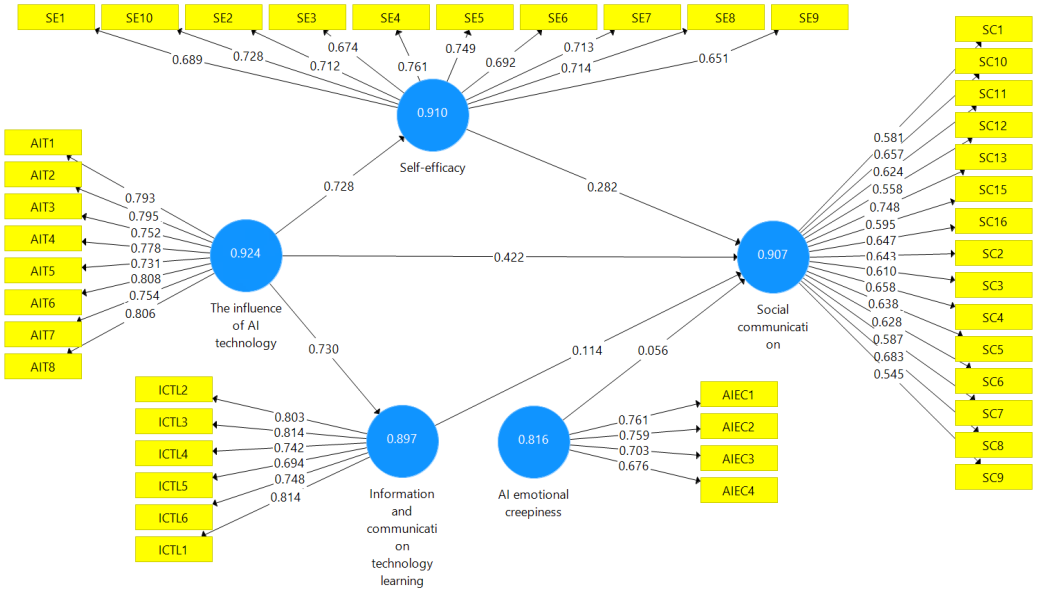

Figure 2: Estimated Model

Table 3 shows the results of the discriminant validity test using the Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio (HTMT). The square root of the AVE for each construct was higher than its correlations with other constructs. This means that discriminant validity is acceptable as shown by the Fornell-Larcker Criterion. For instance, the square root of AVE for AI emotional creepiness was 0.726, which was larger than its correlations with other constructs, including ICT learning of 0.712 and Self-efficacy of 0.844. Likewise, The influence of AI technology had a square root of AVE of 0.777, which was larger than all other constructs' correlations with it, including Social Communication of 0.747. Further, HTMT values have also established discriminant validity since all of them were below the critical threshold of 0.85. For example, the HTMT value for ICT learning and AI emotional creepiness was 0.871, and the HTMT value for Self-efficacy and Social Communication was 0.797, which is within acceptable limits. This analysis underlines that the constructs are distinct and measure separate phenomena.

Table 3: Discriminant Validity

Fornell-Larcker Criterion					
	1	2	3	4	5
AI emotional creepiness	0.726				
Information and communication technology learning	0.712	0.770			
Self-efficacy	0.844	0.798	0.709		
Social communication	0.654	0.686	0.727	0.629	
The influence of AI technology	0.662	0.730	0.728	0.747	0.777
Heterotrait-Monotrait Ratio (HTMT)					
AI emotional creepiness					
Information and communication technology learning	0.871				
Self-efficacy	0.835	0.863			
Social communication	0.804	0.769	0.797		
The influence of AI technology	0.830	0.822	0.808	0.815	

The fit of the model was checked via F-Square, R-Square, and Q^2predict (table 4). The influence of AI technology indicated a strong influence on both ICT learning F-Square = 1.141 and Social Communication F-Square = 1.130. These are values of substantial predictive powers of AI technology in explanations of the constructs. The R-Square values for ICT learning, Self-efficacy, and Social Communication were 0.711, 0.531, and 0.635, respectively, which denotes that the model explained a significant proportion of variance in these dependent variables.

Table 4: Model Goodness of Fit Statistics

F-Square				**R Square**	**R Square Adjusted**
	ICT learning	Self-efficacy	Social communication		
AI emotional creepiness			0.124		
Information and communication technology learning			0.711	0.533	0.531
Self-efficacy			0.043	0.531	0.529
The influence of AI technology	1.141	1.130	0.197		
Social communication				0.635	0.628
Q^2predict			RMSE		MAE
0.642			0.066		0.072

The adjusted R-Square values are slightly lower but still quite robust, such as Self-efficacy with a value of 0.531 and Social Communication of 0.628. This means that the sample size was not overly depended on the fit of the model. Q^2predict was 0.642, which is a marker of high predictive relevance. RMSE and MAE were low at 0.066 and 0.072, respectively, which further supports the reliability and accuracy of the model.

The path analysis indicated that the variables have a significant relationship with one another (table 5). Influence of AI technology significantly had a strong direct relationship with Social Communication, $\beta = 0.362$, $t = 3.950$, $p < 0.001$. Moreover, the Self-efficacy mediation relationship between influence of AI technology and Social Communication had a significant influence, $\beta = 0.171$, $t = 1.783$, $p = 0.038$.

Table 5: Path Analysis

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
The influence of AI technology significantly influences the social communication.	0.362	0.369	0.092	3.950	0.000
Self-efficacy significantly mediates the relationship of the influence of AI technology and social communication.	0.171	0.161	0.096	1.783	0.038
Information and communication technology learning significantly mediates the relationship of the influence of AI technology and social communication.	0.067	0.068	0.070	2.959	0.000
AI emotional creepiness significantly moderates the relationship of the influence of AI technology and social communication.	0.104	0.102	0.037	2.778	0.003

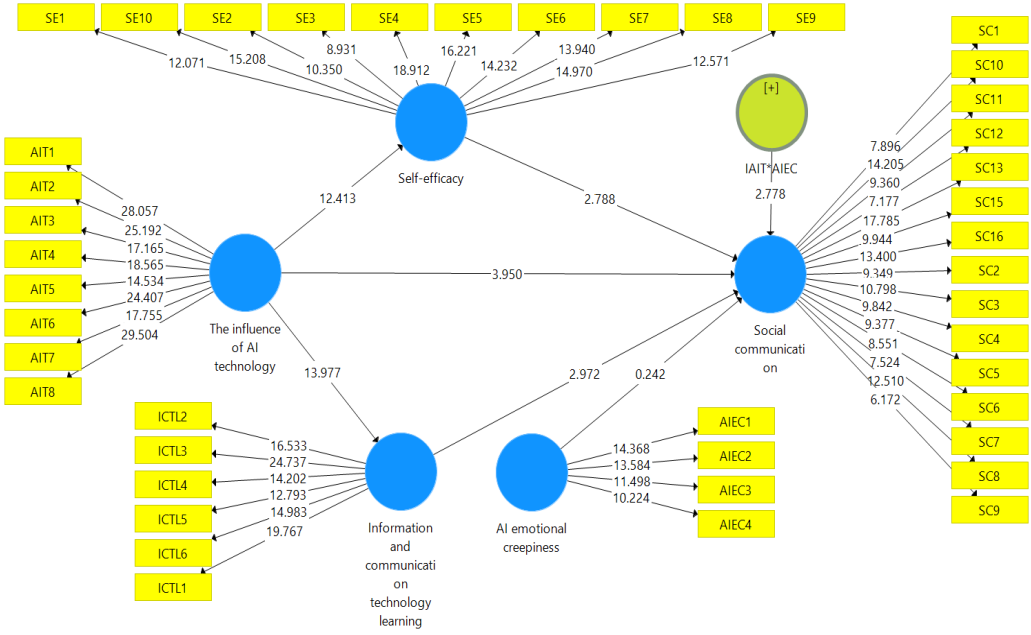

Figure 3: Structural Model for Path Analysis

The role of learning in ICT mediated the relation between influence from AI technology on Social Communication: $\beta = 0.067$, $t = 2.959$, $p < 0.001$; it goes to highlight how the function can help amplify the usability of AI-facilitated social behaviors. It also reveals how AI emotional creepiness acted as

an essential moderator that significantly moderates the effect of AI technology on influencing Social Communication ($\beta = 0.104$, $t = 2.778$, $p = 0.003$). This suggests that though the effect of AI is rather positive, emotional discomfort associated with use can alter its impact on social communication outcomes.

6. DISCUSSION

The transformative role of AI in redefining the paradigms of communication has generated huge academic and practical interest. This study contributes to this ongoing discourse by examining the impact of AI technologies on social communication, emphasizing mediating and moderating factors. The study is grounded on robust theoretical frameworks and validated by empirical analysis; the relationships hypothesized were confirmed by the findings, providing new insights into the mechanisms through which AI shapes human interactions. This discussion unpacks the nuanced dynamics underlying the adoption and effectiveness of AI technologies in communication by integrating concepts such as self-efficacy, ICT learning, and emotional perceptions of AI. The implications of these findings extend beyond academic research to offer actionable insights for organizations, educators, and technology developers striving to balance innovation with human-centric communication values.

The findings strongly support the hypothesis that AI technology exerts a significant influence on social communication. AI has changed the way people and organizations communicate by providing smooth, efficient, and personalized interactions. This is consistent with previous research that showed AI helps improve communication efficiency through chatbots and sentiment analysis (Tlili et al., 2023). The findings suggest that AI does not only make complex communication tasks easy but also inclusive by overcoming linguistic and cultural barriers. However, this impact is two-sided; while AI promotes communication accessibility and responsiveness, there are always concerns about trust and authenticity. These results point to the need for ethical design principles in AI technologies, so they are in harmony with users' expectations and cultural norms. Therefore, the study reiterates the potential of AI to transform the world but emphasizes the imperative need for ethical considerations in its deployment.

The mediating role of self-efficacy within the relationship of AI technology and social communication was supported, thus evidencing that psychological factors characterize technology acceptance. Self-efficacy becomes a critical predictor of effective user interaction with AI technology, giving credence to the central tenet of the Social Cognitive Theory regarding the drive of behavioral actions by confident belief in an individual's capabilities (Dadwal et al., 2024). The results indicated that higher levels of self-efficacy corresponded to more frequent usage of AI technologies for better communication because those individuals who experienced such technologies believed these were facilitators, rather than obstacles, in this case. Therefore, any strategy aimed at improving self-efficacy may pay great dividends in terms of AI-enabled communication technology adoption and success. These insights highlight the critical need for user-centric approaches toward AI development, emphasizing empowerment and skills building to maximize the social benefits of such technologies.

The affirmation that ICT learning is indeed one of the most important mediating factors in this connection highlights the significance of technical competence in optimizing the use of AI technologies for communication purposes. According to the findings, as found in the previous research, the learners who receive ICT learning have a better grasp of navigating AI tools to gain positive communication outcomes (Zhou et al., 2024). ICT learning also contributes to the acquisition of technical knowledge but at the same time provides deeper understanding about what AI can do and cannot do. This

mediating effect suggests that the fostering of ICT literacy should be a priority for organizations and educational institutions looking to integrate AI technologies effectively. Furthermore, these findings emphasize the role of continuous learning in filling the gap between technological advances and user readiness, ensuring AI tools are used to their maximum potential in various communication contexts. The moderating role of AI emotional creepiness reveals the subtle emotional dynamics that influence users' interactions with AI technologies. The phenomenon of discomfort with overhuman-like AI behavior affects users' perception of the role of AI in communication in a very significant way. The results support that greater emotional creepiness of AI reduces positive effects on social communication that AI has, which relates to Affect Theory based on the fact that more emotional responses impact behavior (Gao et al., 2024). It implies users like AI because it does things in an efficient way, but too human-like makes skepticism and low trust. Those results emphasize that the importance to balance human-likeness to transparency and authenticity in AI creation. Addressing emotional concerns of users can decrease the negative impact of creepiness, which would contribute to greater acceptance and efficiency of AI technologies in communication.

In conclusion, synthesizing the findings of this research throws light on the complex play of technological, psychological, and emotional factors in social communication through AI-driven applications. Together, the validated hypotheses demonstrate that the influence of AI spreads beyond functionality and molds the users' perceptions, competencies, and emotional responses. Through unpacking the mediating roles of self-efficacy and ICT learning and the moderating influence of AI emotional creepiness, this research will provide a comprehensive understanding of the dynamics underlying AI's influence on communication. Such findings are not only advancing theoretical discourse but also providing actionable guidance for practitioners and policymakers. As AI technologies evolve, the realization of their transformative potential in social communication hinges on embracing a balanced approach that prioritizes user empowerment, ethical design, and emotional authenticity.

7. CONCLUSION

This work brings out the intricate relationship of AI technologies to self-efficacy, social communication, and emotional responses, thereby contributing both to theoretical and practical domains. By investigating the mediating and moderating effects of self-efficacy and emotional creepiness, this study offers a comprehensive structure for understanding the multifold effects of AI on human-to-human interactions. The study results indicate the bivalent possibilities of AI technologies: their potential to make communication better and evoke emotional unease. These results thus urge the balancing of the incorporation of these AI technologies in educational and work-life settings. The more AI is infused into all walks of life, the more essential human-centric approaches are to be highlighted. This paper advocates for designs and policies that are user-centered emotionally and socially, so technological development is in line with human values and needs. This study provides a foundation for ongoing discourse on responsible and effective AI adoption that will pave the way toward a more inclusive and empathetic digital future.

8. IMPLICATIONS OF THE STUDY

This research contributes considerably to the growing body of literature about how AI technology impacts social communication, self-efficacy, and emotional responses within educational and workplace contexts. The study provides nuanced insights into the influence of AI technologies both

on individual behaviors and more general societal dynamics by probing these constructs through the prism of advanced statistical models. In particular, the integration of emotional creepiness with AI usage highlights a previously underexplored dimension of AI adoption, bridging psychological theories with technological innovation literature. This approach enhances the theoretical knowledge of technology acceptance models, especially in environments where emotional responses determine the user's behavior. In addition, the study delves deeper into the self-efficacy mediating role in the improvement of social communication in accordance with self-determination theory and extends it to the digital era. The findings also offer a theoretical basis for the social and psychological impacts of AI on human interactions. The research expands on the theories of social cognitive behavior and technology adoption by incorporating constructs such as information and communication technology learning and AI emotional creepiness. These theoretical advancements are critical in understanding the dual-edged nature of AI, which can both enhance and disrupt communication patterns. Additionally, methodological soundness-ensuring that reliability and validity measures have been deployed-strengthens the theoretical discourse with an elaborate framework for future studies on the dynamics of human-AI interaction.

The practical applications of the research are innumerable, providing critical insights into how educators, organizational leaders, and policymakers can streamline AI integration to benefit end-users. For educators, the findings point to how AI technologies can influence the learning environment to enhance self-efficacy and to interact meaningfully with technological tools. AI-driven systems can be designed to promote not only efficiency at task but also emotional and social well-being, thereby eliminating the creepy effects perceived through AI adoption. Policymakers and educational institutions can make use of these findings to construct AI-centric learning policies where emotional safety is held paramount along with skill development. In organizational settings, this study emphasizes the need to establish an environment where employees are comfortable to engage with AI systems. Training programs and the development of user-friendly interfaces for AI can be helpful in reducing emotional distress but increase self-efficacy and social communication. Open dialogue and support mechanisms that address the emotional responses to AI can therefore be implemented in organizations. This way, organizations may create a balanced approach in implementing AI. This work calls for human-centered design of AI where the psychological needs of the users match with the technological capabilities to avoid adopting AI in ways that stifle collaboration, innovation, and positive workplace dynamics.

9. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

While this study is highly relevant, several limitations need to be acknowledged. First, the cross-sectional study design prevents establishing causality among the variables under analysis. Longitudinal research would have better captured how AI technologies influence social communication and self-efficacy over time. Second, the current study relies on self-reported data, which may be plagued by biases due to social desirability or misperceived self-assessment. Future studies could extend the current findings by adding observational or experimental methods to the study. Moreover, the study focuses on specific educational and work contexts, thereby limiting the generalizability of its findings to other domains like healthcare or entertainment. A more comprehensive understanding of AI may be obtained if these constructs were explored in various cultural and organizational settings. Future studies should also dig deeper into the emotional aspects of AI, exploring how trust and ethical considerations shape user acceptance. The use of qualitative methods, such as interviewing or focus groups, may further provide insight into complex emotional and social responses to AI.

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