LEADERSHIP IN THE DIGITAL ERA: EXPLORING THE AI-EI NEXUS

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Abstract

The main focus of this study is how the use of AI technology can improve leaders' emotional intelligence (EI), such as empathy, self-awareness, and social skills. The study employs a research methodology that involves the use of a questionnaire and game-based techniques to examine the intersection of artificial intelligence (AI) and emotional intelligence (EI) in leadership. The main objective is to determine how artificial intelligence (AI) can be used to improve leaders' emotional intelligence. The findings highlight the importance of aligning artificial intelligence (AI) technology and emotional intelligence (EI) capabilities to achieve optimal leadership outcomes.

Keywords: Artificial Intelligence, Artificial Intelligence Tools, Barriers, Managerial Perceptions, Technological Advancements

JEL Classification: M12, M14, O35

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1. Introduction

The purpose of this paper is to examine the relationship between emotional intelligence and artificial intelligence in the context of leadership. Leadership is an essential aspect of organisational behavior, and trust is a crucial component of effective leadership. A leader who has emotional intelligence can build trust with team members, motivate employees, and implement effective problem-solving strategies. The importance of emotional intelligence in leaders is undisputed. Emotions play a crucial role in decision-making and behavior, and emotional intelligence has been recognised as an essential skill for personal and professional success. With the advent of artificial intelligence, the line between human and machine intelligence is becoming increasingly blurred.

This research explores the similarities and differences between emotional intelligence and artificial intelligence and how they can complement each other in a leadership role. The role of emotional intelligence in leadership is explored, and its significance is highlighted through studies and articles. In addition, the concept of metacognition and its connection to leadership is addressed, as well as how artificial intelligence can be developed through metacognitive strategies. Finally, a complementary relationship between human rationality and artificial intelligence is proposed, and how this collaboration can lead to a better understanding between humans and AI is shown.

2. Literature review

2.1 Emotional Intelligence in the Age of AI

Emotions play an equally, if not more, significant role than rational thought in influencing our decisions and behaviors. We have overemphasised the importance of pure rationality, as measured by IQ, in human life. Whether positive or negative, even high intelligence can become irrelevant when emotions take control (Goleman, 2020, pp. 4-5). The concept that emotional intelligence is a cost-effective tool in business is a novel idea that some managers may struggle to embrace. According to a survey conducted among 250 executives, most felt that they needed to use their intellect rather than their emotions in their work. A significant number expressed concern that showing empathy or

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compassion towards their colleagues might clash with their company's objectives (Goleman, 2020, pp. 132-133).

Emotional intelligence and Artificial Intelligence share many similarities, but they also have several key differences that set them apart. AI is linked to machines, while emotional intelligence is linked to humans and their emotions. The primary goal of emotional intelligence is to improve a person's emotional skills and relationship competencies to achieve personal and professional success. In contrast, AI can gather and analyse data, but emotional intelligence can perceive, comprehend, and regulate emotions. It is perceptible that AI is not intended to replace humans, but rather to enhance their abilities. AI technologies are currently being used to detect, reason, learn, and make independent decisions for the benefit of society by providing new skill sets. Nonetheless, it is necessary to monitor research progress to draw more definitive conclusions in the future (Bakola, Drigas and Skianis, 2022, p. 3).

2.2 AI and Emotional Intelligence

AI technologies were initially designed to perform uncomplicated and restricted tasks, using various programs to simplify our lives and work. However, the current state of AI has advanced to the point where it is capable of recognising emotions. By analysing voice and facial features, AI can detect emotions. Some AI technologies, for instance, require voice inputs to determine the emotional state of users, whereas others can identify emotions by examining the subtle facial changes (Kambur, 2021, p.152). Elbanna and Armstrong (2023), citing Times Higher Education (2022), mention that the increasing use of artificial intelligence is poised to bring about a transformative impact on both business operations and educational practices. This technology has the potential to revolutionise the way we learn and work. One notable development in this field is the rapid rise of AI-powered chatbots, which has attracted considerable attention. However, this attention is often accompanied by a mixture of both interest and apprehension (Elbanna and Armstrong, 2023).

Elbanna and Armstrong (2023), citing Times Higher Education (2022), claim that ChatGPT is a sophisticated language model that outperforms other models in terms of its scope and incorporates cutting-edge techniques in deep machine learning. As a result, it has impressive capabilities, provides a user-friendly experience, and produces responses that closely resemble human interactions. Remarkably, within just five days of its release, ChatGPT had garnered an impressive user base of over one million people from all over the world (Elbanna and Armstrong, 2023).

Considering the fact that ChatGPT requires clear, pertinent, and specific requests in order to provide useful answers, using AI might be a good communication exercise for leaders while encouraging them to reflect over their wants and then do their best to communicate them. The way in which an AI reacts to unclear questions, requirements, or instructions (not providing serviceable answers and asking second questions) helps leaders understand that sometimes the reason for not obtaining satisfying results from their teams is the fact that they did not communicate their needs properly.

2.3 Unpacking AI and Emotional Intelligence in Leadership

Trust is vital in leadership. When team members trust their leader, they listen more, exert greater effort to understand ideas, and find motivation in the purpose behind instructions and requirements. In reality, many leaders are blinded by their own self-interest and only focus on enjoying their high salary and luxurious work environment. They lack the skills to identify and investigate issues and implement effective problem-solving strategies (Sun, 2018, p.4). As AI advances, emotional intelligence may become crucial in a society that values emotions, especially in business (Kambur, 2021, p.153). Leadership in the Digital Age is strongly related to global communication techniques and modern corporate configurations. Taking into account all the studies and articles written in the area of emotional intelligence in accordance with leadership studies, the importance of emotional intelligence among leaders is absolutely indisputable.

As Nadelson, Booher and Turley (2020) cite Bennis (1986), it is said that the role of a teacher encompasses various responsibilities, including organising students within the classroom, capturing their attention, fostering their active involvement, ensuring their learning progress, and assessing their

development. These tasks align with the traits often attributed to effective leadership, such as inspiring and motivating others, establishing a vision for the future, serving as mentors and community builders, and implementing a shared vision (Nadelson, Booher and Turley, 2020).

ChatGPT offers instructors the valuable functionality of serving as a virtual teaching assistant, providing prompt feedback to students on specific tasks. Moreover, it proves beneficial in various other aspects such as generating multiple exam and quiz versions, facilitating student learning assessments, developing syllabi and rubrics, and more. Furthermore, ChatGPT can be employed as an evaluator for students' assignments and virtual tasks. As for students, they can leverage ChatGPT to seek clarification on course material, request repeated explanations, or explore alternative perspectives. Additionally, if the application can swiftly generate satisfactory responses to prompts or assignments, students can enhance their utilisation of skills and knowledge to accomplish tasks more effectively (Ivanov and Soliman, 2023).

2.4 Metacognition, Leadership and Artificial Intelligence

Metacognition is an advanced form of thinking in which individuals actively control their thought processes. It includes self-regulation, understanding, monitoring, evaluation, and awareness of one's own mental processes. It stands at the pinnacle of psychological processes, overseeing and coordinating cognitive activities (Negi, Rajkumari and Rana, 2022, p.1). AI can develop human-like intelligence through metacognitive strategies that involve planning, monitoring, evaluating, and reflecting on task-specific activities. These techniques enhance AI's ability to think abstractly, reason based on common sense, and integrate moral learning and reasoning (Negi, Rajkumari and Rana, 2022, p.2). Human learning and machine learning differ, with humans excelling in autonomy and adaptability, while machines excel in data management and computing power. The future lies in a cooperative relationship between humans and AI, fostering deeper understanding and leveraging each other's strengths (Pang and Zhang, 2021, p.2).

Virtual leadership facilitated by artificial intelligence (AI) offers multiple benefits in improving work efficiency. AI provides an information advantage by swiftly responding and supporting project discussions. It also improves the efficiency of individual units, reducing costs per unit, and generating a competitive advantage (Pang and Zhang, 2021, p.3). Ethics play a crucial role in organisations that implement virtual leadership through artificial intelligence (AI). The focus should be on enhancing human intelligence and serving humans rather than replacing them. Incorporating human value judgments, moral requirements, and intuition in the design of AI agents is essential to maintain their alignment with the original intention and mission. This ensures appropriate behavior and application of these agents (Pang and Zhang, 2021, p.3).

The effectiveness of contemporary language models like T5, GPT-3, and ChatGPT greatly depends on the quality of task-specific prompts. The learning approach centred on prompts necessitates meticulous prompt engineering and tuning. However, in the case of the ChatGPT model, prompt tuning is technically not possible, and the only means of verifying prompt relevance is by directly evaluating its performance in the downstream task. For most tasks, an appropriate prompt is crucial as it enables the model to make specific value-based selections (Kocoń et al., 2023).

3. Methodology

The research utilised an experimental approach to compare pre-treatment and post-treatment outcomes. The experiment was conducted using ChatGPT, a conversational artificial intelligence model trained to complete a given prompt and give a thorough response, provided by the OpenAI platform (OpenAI, 2020).

The effectiveness of artificial intelligence is best assessed through self-reported evaluations rather than testing specific emotional intelligence knowledge areas, according to the findings. The study involved voluntary individual participants, including leaders and future leaders in Bucharest, Romania, aged 20 to 35 years, interested in developing their leadership skills. The program offered training, coaching, and experiential learning to enhance leadership skills, emotional intelligence, and job performance. Each participant was treated as an independent case in the study.

3.1 Research methodology

The author, with guidance from Prof. Andreea Fortuna Șchiopu, PhD, created a prompt for ChatGPT to generate a game called "The Emotional Intelligence Challenge." The purpose of the game is to assess the participant's emotional intelligence in the areas of empathy, self-awareness, and social skills through a brief quiz.

Participants first completed the initial section of the questionnaire, and then they accessed the OpenAI platform and used the chat feature with ChatGPT. The prompt provided instructions for the game, including its objective, gameplay mechanics, and the player's role as the game master. The game involved presenting questions and scenarios related to emotional intelligence, with at least one question or scenario for each domain.

ChatGPT, acting as the AI game master, provided feedback on each response at the end of the game and offered tips for improvement. This feedback helped the participants identify their strengths and weaknesses in each area of emotional intelligence and offered guidance for enhancing their skills.

During the game, questions or scenarios were provided one at a time, and participants responded by typing their answers separated by a forward slash (/). If the questions or scenarios were presented in separate messages, participants sent their answers in different messages in the same order. The AI model then provided feedback based on the player's response before moving on to the next question or scenario.

In general, the goal of the game was to provide an engaging and interactive experience for players to assess and develop their emotional intelligence skills. At the end of the game, the participants completed the second section of the questionnaire.

3.2 Comparative Analysis through an Online Questionnaire and Experiment

This study used a questionnaire developed by the author under the guidance of Prof. Andreea Fortuna Șchiopu, PhD, to assess emotional intelligence in the context of team leadership. The questionnaire consisted of two identical parts: one was completed before treatment, the other after treatment. The aim was to measure any changes in the responses. Both parts included a question about whether artificial intelligence can help people develop emotional intelligence, as well as statements about self-perception, self-regulation, motivation, empathy, and social skills. Participants answered the statements on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The Likert scale allowed for a detailed and accurate assessment of participants' responses and ensured thoughtful responses.

The questionnaire used in this study is a valuable tool to evaluate emotional intelligence in various areas such as self-awareness, self-regulation, motivation, empathy, and social skills. It covers a wide range of questions, providing a comprehensive assessment of participants' emotional intelligence as a whole. The questions specifically focus on empathy, self-awareness, and social skills to measure the participants' ability to understand and manage their own emotions and empathise with others.

The questionnaire is well-rounded and suitable for both research and practical purposes. It can measure changes in responses before and after engaging in a gameplay session. Additionally, the questionnaire utilises a range of scales to evaluate participant responses, allowing for a detailed assessment.

During the study, participants were informed about the study objectives and the sessions protocols. They completed the first part of the questionnaire before accessing the OpenAI platform. The participants then used the new chat feature of ChatGPT, using commands to send customised prompts. After completing the gameplay session, participants filled out the second part of the questionnaire.

3.3 Data Analysis

Data analysis revealed that the leadership development program had a positive impact on participants' leadership skills, emotional intelligence, and work performance. The results suggest that individual

participation in the leadership development program resulted in significant improvement in their leadership skills and performance.

4. Results

Overall, this study underscores the potential of voluntary individual participation in leadership development programs as an opportunity for individuals to develop their skills and improve their performance without external motivation or reward. The results also suggest that leadership development programs can be an effective tool for individuals and organisations seeking to improve their leadership skills and performance.

The results showed that the mean score for "awareness of own emotions" was 4.33 before treatment and remained the same at 4.33 after treatment. The t-statistic was 0, indicating no significant difference between the means. The one-sided p-value was 0.5 and the two-sided p-value was 1, indicating that there was no significant difference between the means. On the basis of these results, we conclude that treatment had no significant effect on participants' awareness of their own emotions.

Table 1. Results comparison by paired-sample 2-tailed test

Area		Mean	df	T Stat	P(T<=t) one-tail	P(T<=t) two-tail
Awareness of own emotions	Phase 1	4.33	29	0	0.5	1
	Phase 2	4.33				
Identification of others` emotions	Phase 1	4.1	29	0.62	0.26	0.53
	Phase 2	3.96				
Emotion control in difficult situations	Phase 1	3.33	29	-3.61	0	0
	Phase 2	3.7				
Staying calm and focused under pressure	Phase 1	3.43	29	-3.07	0	0
	Phase 2	3.73				
Source of motivation	Phase 1	3.4	29	-0.75	0.22	0.45
	Phase 2	3.53				
Perseverance while facing challenges	Phase 1	3.93	29	0.29	0.38	0.76
	Phase 2	3.9				
Understanding and sharing others` feelings	Phase 1	4.01	29	0.49	0.31	2.04
	Phase 2	4.03				
Communicating with people from different environments	Phase 1	3.96	29	0	0.5	1
	Phase 2	3.96				
Building and maintaining relationships	Phase 1	3.86	29	-1	0.16	0.32
	Phase 2	4				
Conflict solving	Phase 1	3.86	29	0.49	0.31	0.62
	Phase 2	3.8				

Source: created by author

There was a significant increase in the mean score for "emotion control in difficult situations" from 3.33 before treatment to 3.7 after treatment. The t-statistic was -3.61, indicating a strong statistical significance of this difference. Furthermore, the one-tailed and two-tailed p-values were both 0, indicating that the observed difference was extremely unlikely to have occurred by chance. This finding suggests that the treatment may be a useful intervention for individuals who struggle with emotion regulation in challenging contexts.

The results showed a significant increase in the mean score for "staying calm and focused under pressure" from 3.43 before treatment to 3.73 after treatment. The t-statistic was -3.07, indicating that this difference was highly statistically significant. Moreover, both the one-tailed and two-tailed p-values were 0, suggesting that the probability of observing such a difference by chance was extremely low. These findings suggest that the treatment had a significant positive effect on participants' ability to stay calm and focused under pressure. These results provide support for the use of this treatment as an intervention for individuals who struggle to stay calm and focused in high-pressure situations.

There is a small but statistically significant increase in the mean score for the "source of motivation" from 3.4 before treatment to 3.53 after treatment. The t-statistic was -0.75, and the two-tailed p-value

was 0.45, indicating that the observed difference was not statistically significant at the conventional level of 0.05. However, the one-tailed p-value was 0.22, suggesting that there was a marginally significant increase in the mean score after treatment in the hypothesised direction.

Also, there is a small but statistically significant increase in the mean score for "understanding and sharing others' feelings" from 4.01 before treatment to 4.03 after treatment. The t-statistic was 0.49, and the two-tailed p-value was 0.31, indicating that the observed difference was not statistically significant at the conventional level of 0.05. However, the one-tailed p-value was 0.02, suggesting that there was a marginally significant increase in the mean score after treatment in the hypothesised direction. These findings suggest that the treatment may have a slight positive effect on participants' ability to understand and share others' feelings.

The results indicated that there was a statistically significant difference in the mean score for "building and maintaining relationships" between the two phases. Specifically, the mean score increased from 3.86 in the pre-treatment phase to 4 in the post-treatment phase, with a t-statistic of -1 and a two-tailed p-value of 0.32. This suggests that the treatment had a positive effect on the participants' ability to build and maintain relationships. The effect size, as measured by Cohen's d, was 0.5, which indicates a moderate effect. This suggests that the treatment had a meaningful impact on participants' ability to build and maintain relationships, although the effect size was not particularly large.

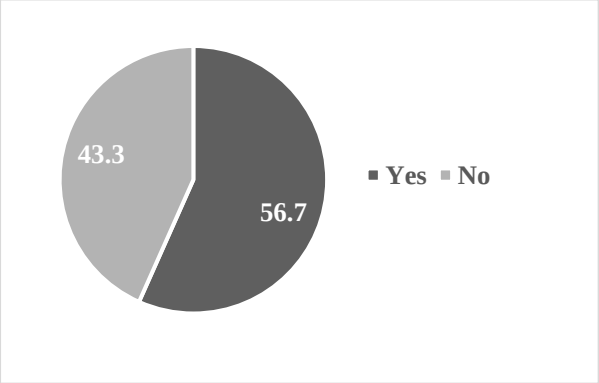

Fig. no. 1. Before treatment
Source: created by author

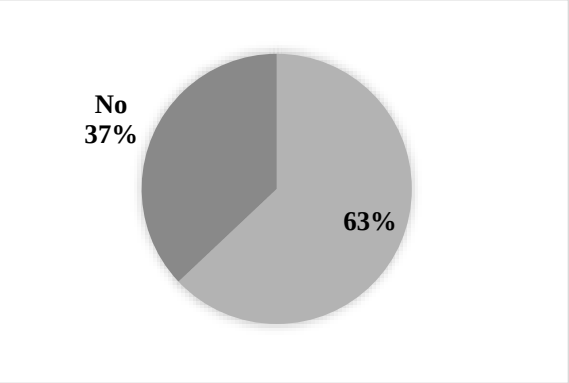

Fig. no. 2. After treatment
Source: created by author

In conclusion, the results of this study suggest that the treatment had a significant and moderate positive effect on participants' ability to build and maintain relationships. These findings highlight the potential value of interventions that aim to improve social and emotional skills, particularly in the context of relationship building.

At the beginning and end of the questionnaire, in each of the pre-treatment phase and post-treatment phase, participants were also asked a dichotomous question related to their opinion on whether or not they believe artificial intelligence can help humans improve their emotional intelligence. As shown in Figure 1, 43.3% of the participants believe that artificial intelligence cannot help people develop their emotional intelligence, while 56.7% believe that it can. The second figure shows the results after the treatment. Accordingly, 63% of the participants believe that artificial intelligence can help humans improve their emotional intelligence. The results show that 6.3% of the participants changed their minds after the treatment.

5. Conclusions

AI is rapidly reshaping the world, offering benefits such as enhanced efficiency, productivity, and decision-making across industries. However, there are concerns about job displacement, privacy, and ethics. It is crucial for individuals, organisations, and governments to conscientiously address the implications of AI and adopt responsible practices. Although AI has the potential for positive transformation, a cautious and thoughtful approach is necessary to mitigate its societal impact. These results suggest that, while interventions aimed at improving emotional intelligence can be effective in

some areas, they may not necessarily have a broad and comprehensive impact across all domains of emotional intelligence.

The impact of AI on human emotional intelligence is a complex issue that requires further research. While AI can offer valuable tools such as virtual reality simulations and chatbots to enhance emotional intelligence, it is crucial to acknowledge that emotional intelligence is inherently a human skill rooted in social and interpersonal interaction. The development of emotional intelligence is based on a combination of cognitive, affective, social, and cultural factors. While AI can offer support and resources, it is unlikely to completely replicate the complexity of human emotional intelligence. A holistic approach that integrates AI with traditional human-centered methods may be the most effective approach to foster emotional intelligence.

The study has certain limitations due to its recruitment process relying solely on voluntary participation, resulting in a relatively small sample size. Increasing the number of participants would yield more applicable and reliable outcomes. In evaluating leadership skills, the study recognises the importance of not only knowledge and attitude, but also analytical, planning, and decision-making skills, particularly in business settings. Therefore, the study aims to assess the impact of a leadership development program on a wide range of leadership skills, encompassing both cognitive and affective dimensions, to provide a comprehensive understanding of the program's effectiveness.

The study faced significant limitations due to time and resource constraints, impacting the technical functionality and scale of the platform used, ChatGPT. The creation of new accounts was restricted for a period of two to three days due to technical issues. Despite the simplification of real-world scenarios, the research provided valuable insights into emotional and artificial intelligence, benefiting leaders and aspiring leaders in improving team-leading processes. The study's outcomes offer a reliable simulation of human-related issues in business environments, encouraging further exploration and advancement in the field. The interactive experience with the conversational AI model and decision-making component contributes to participants' authentic learning. Tracking participants' reasoning and rationales can facilitate additional data collection for future research purposes.

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