Artificial Intelligence in Leadership Learning: Enhancing Team Climate and Collaboration in Students' Projects

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ABSTRACT
Teamwork and leadership learning are changing as a result of the use of Artificial Intelligence (AI) tools in higher education. This empirical research investigates how AI tools, especially ChatGPT, enhance team-based learning in an Entrepreneurial Leadership course, centering on a Department Camp Project completed by 100 university students. Utilizing a mixed-methods approach, the research employs the Team Climate Inventory (TCI) to quantitatively assess four aspects of team climate-vision, participative safety, task orientation, and support for innovation-while qualitative insights were collected through open-ended surveys examining how students utilized AI tools during their team activities. Results indicate that regular and intentional use of AI, such as for generating ideas and organizing tasks, correlated positively with improved scores in team climate. Thematic analysis of qualitative feedback suggests that AI tools aided in fostering inclusive participation, clarifying shared objectives, and encouraging innovative input throughout the project. This research demonstrates the benefits of integrating AI into leadership education to enhance team effectiveness, providing practical recommendations for educators creating future collaborative learning experiences.

Keywords: *Artjjjificial Intelligence, Leadership Learning, Team Climate, Students' Projects.*

1. INTRODUCTION

Developing productive team dynamics is critical in today's higher education, especially in leadership and project-based learning environments. A constructive team environment – marked by a shared vision, a sense of participative safety, encouragement of innovation, and a focus on task – has been associated with improved collaboration, creativity, and overall project success (Anderson & West, 1998). Recent research has highlighted the significance of participative leadership within higher education institutions, showing that such leadership styles greatly improve innovation and organizational commitment by engaging team members in the decision-making process (Riza et al., 2025). Additionally, psychological safety among teams has been recognized as a vital element that influences the relationship between leadership and team innovation performance, underscoring the necessity for inclusive and participatory management practices (Yin et al., 2022). The incorporation of active learning methods and real-life applications in team-based projects has also been demonstrated to enhance student engagement and the cultivation of collaborative skills, which are crucial for successful teamwork (Francis et al., 2025). Moreover, immersive and experiential learning initiatives in business schools have been acknowledged for their contribution to transforming education into a collaborative tool for impact, stressing the importance of team dynamics in tackling global issues (Seppala & Smith, 2020). Together, these insights highlight the vital role of a supportive team environment in improving educational outcomes and equipping students for cooperative work settings.

The development of artificial intelligence (AI) tools, particularly language models such as ChatGPT, has resulted in novel teaching methodologies. These tools impact how students engage in collaborative projects by providing real-time assistance with brainstorming, content development, and decision-making (Bhullar et al., 2024). These tools also assist students in their leadership class. Students in Universitas Ciputra Surabaya, specifically International Business Management-International Class (IBM-IC) Major, take a course in Entrepreneurial Leadership, which has the learning outcome of putting leadership ideas into practice, i.e., Department Camp Project. The incorporation of AI tools into such projects provides a chance to investigate their impact on team dynamics and collaboration. Hence, the team climate within the students is formed.

While existing literature acknowledges AI's potential to improve educational experiences, empirical studies particularly investigating the relationship between AI tool usage and team climate inside leadership learning environments are limited (Bhullar et al., 2024). Understanding this relationship is critical for optimizing AI integration in educational settings to promote successful cooperation and leadership skills. Therefore, the purpose of this project is to look at how AI tools, specifically ChatGPT, help students develop leadership and collaborate as a team. The study uses the Team Climate Inventory (TCI) as a measurement instrument to investigate the relationship between AI usage and various aspects of team climate. In addition, the research questions are as follows:

1. How did students use AI tools for their Department Camp Project?
2. What is the relationship between AI utilization and team climate variables like vision, participative safety, task orientation, and support for innovation?

1.1 Artificial Intelligence (AI)

Artificial Intelligence (AI) has transformed the landscape of education, offering tools that support personalized learning, decision-making, and performance feedback (Tilepbergenovna, 2024). In the context of leadership learning, AI can function as a facilitator, providing adaptive learning environments that simulate real-world scenarios and offer data-driven insights into individual and group behavior (Madanchian et al., 2024). AI-enhanced platforms such as virtual coaches, chatbots, and intelligent tutoring systems have shown promise in developing soft skills such as communication, empathy, and strategic thinking. skills essential for effective leadership (Alvarado-Bravo et al., 2024). The integration of AI allows educators and students to analyze team dynamics, monitor emotional intelligence, and adjust leadership strategies in real-time, making it a powerful tool in leadership education (Dwivedi, 2025).

1.2 Leadership Learning

Leadership learning involves acquiring the knowledge, skills, and attitudes necessary to lead individuals and teams effectively (Purohit, 2023). It is often experiential and reflective, requiring learners to engage in real or simulated environments where leadership behaviors can be practiced and refined (Kalińska, 2010). Leadership education has traditionally focused on theoretical models and classroom-based instruction, but there is a growing emphasis on active learning methods such as peer mentoring, case studies, and project-based learning (Grimard, 2018). In particular, leadership camps have emerged as effective platforms to build foundational leadership capabilities among students, offering a structured environment for collaboration, problem-solving, and self-awareness (Grimard, 2018). These programs are essential in preparing students to take on future roles in organizational settings.

1.3 Team Climate Inventory (TCI)

The Team Climate Inventory (TCI) is a validated framework used to assess the social and psychological environment within a team (Ouwens et al., 2008). It comprises four key dimensions: vision, participative safety, task orientation, and support for innovation (Ouwens et al., 2008). These factors collectively influence how team members perceive collaboration, contribute to decision-making, and support each other in achieving shared goals (orekoya, 2024). TCI is particularly relevant in educational settings where teamwork is essential for learning outcomes. Understanding team climate through TCI provides insights into how leadership behavior, communication styles, and conflict resolution practices impact group effectiveness (Francis et al., 2024). In leadership learning, TCI serves as a metric to evaluate how well students apply leadership skills in managing group dynamics (Alsalman & Chyad, 2025).

1.4 Students' Projects

Student-led projects, such as leadership camps, provide practical environments for applying leadership theory to real-life situations (Almazovaite et al., 2024). In this study, the Leadership Camp organized by the program study serves as the primary platform for examining leadership development. Designed to train underclassmen in leadership principles, the camp includes activities that foster collaboration, problem-solving, and decision-making. These experiences allow students to exercise both formal and informal leadership roles, enhancing their understanding of team dynamics and personal leadership style (Almazovaite et al., 2024). By integrating AI tools into these projects, educators can gather and analyze data related to team interactions, offering feedback that reinforces effective leadership behaviors and improves team climate (Florea & Croitoru, 2025). The Leadership Camp thus becomes a living lab for studying the intersection of AI, leadership learning, and team collaboration, as measured by TCI.

2. RESEARCH METHODS

2.1 Research Design

This research adopts a mixed-methods framework, combining quantitative and qualitative methods to examine the connection between the utilization of AI tools and team climate among university students. The quantitative aspect employs the Team Climate Inventory (TCI) to evaluate team dynamics, while the qualitative aspect consists of open-ended surveys designed to capture students' perspectives on their experiences with AI tools during their projects. This structure facilitates a thorough understanding of how the incorporation of AI affects team collaboration and climate.

2.2 Participants

The sample for this research includes 100 undergraduate students enrolled in the Entrepreneurial Leadership course at Universitas Ciputra Surabaya, all of whom have previously completed the Essentials of Leadership course. These students took part in a Department Cam Project requiring them to collaborate in teams to implement leadership principles in a real-world context. The criteria for selection ensured that participants possessed a foundational grasp of leadership concepts and were involved in a group project where AI tools could be applied.

2.3 Instruments

2.3.1 Team Climate Inventory (TCI)

The Team Climate Inventory (TCI) is a validated tool designed to evaluate team climate across four dimensions: Vision, Participative Safety, Task Orientation, and Support for Innovation (Anderson & West, 1998). The TCI includes Likert-scale items that assess team members' perceptions of how their team operates. This instrument has shown reliability and validity in numerous organizational scenarios and is appropriate for examining team dynamics in educational environments.

2.3.2 Open-Ended Survey on AI Usage

To collect qualitative data, an open-ended survey was implemented, encouraging students to reflect on their AI tool usage during the Department Camp Project. The survey questions concentrated on the types of AI tools used (e.g., ChatGPT, Grammarly, etc.), the frequency of their usage, purposes (e.g., brainstorming, drafting, editing, etc.), and their perceived effects on team collaboration and project results. This methodology aligns with recent research highlighting the significance of comprehending students; experiences and views on AI integration in educational settings (Chan & Hu, 2023)

2.4 Data Collection Procedures

Data gathering occurred in two (2) stages:
Quantitative Phase: The TCI was administered electronically to all participants after the conclusion of the Department Camp Project. Participants evaluated their levels of agreement with statements concerning team climate using a 5-point Likert scale.
Qualitative Phase: Subsequently, participants are observed while their preparation of the camp, the meetings, the marketings, the fulfilment of inventory, etc. In addition, the researchers could get the in-depth responses regarding their encounters with AI tools throughout the project. This sequential framework enabled the collection of extensive data regarding team dynamics and AI utilization.

2.5 Data Analysis

2.5.1 Quantitative Analysis

The quantitative data obtained from the TCI was examined using descriptive statistics to summarize the central tendencies and variation in scores across the four dimensions of team climate. Furthermore, correlation analyses were performed to investigate the relationships between the frequency and purposes of AI tool usage (as documented in the

qualitative observation) and the TCI scores. This analytical methodology is informed by previous studies that have investigated the integration of AI in educational contexts and its effects on student collaboration and performance (Baca & Zhushi, 2024)

2.5.2 Qualitative Analysis

The qualitative responses underwent thematic analysis to uncover recurring patterns and themes concerning AI tool usage and its perceived influence on team collaboration. The researchers observed the activities of the students as a committee when they do meetings, recordings, tapping, selling, promoting, etc., and noted down how AI tools were used in supporting their program. The application of AI tools in qualitative research, such as ChatGPT, has been examined in recent studies, which underscore their potential utility in thematic analysis while also recognizing the necessity of human oversight (Turbov et al., 2024).

3. RESULTS AND DISCUSSIONS

3.1 Result

3.1.1 TCI Result

The Team Climate Inventory (TCI) based on the model by Anderson & West (1998), was used to assess students' perception of team climate during their participation for being on committees in a leadership camp. The questionnaire survey was distributed via Google Form. Responses used a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree). The interval, Table 1, is used to interpret the five-point Likert scale as follows.

$$\text{Interval} = \frac{5-1}{5} = 0.80$$

Table 1. Interval Categories

Intervals	Category
1.00-1.80	Strongly Disagree (SD)
1.81-2.60	Disagree (D)
2.61-3.40	Neutral (N)
3.41-4.20	Agree (A)
4.21-5.00	Strongly Agree (SA)

Source: Sugiyono (2022)

The results across 100 student participants, IBM-IC students at Universitas Ciputra Surabaya, showed strong team climate characteristics across all four dimensions as stated below.

Table 2. Mean Score of Respondents' Answers to TCI

Dimension	Mean	Category
Vision	4.45	Strongly Agree (SA)
Participatory Safety	4.288	Strongly Agree (SA)
Task Orientation	4.207	Agree (SA)
Support for Innovation	4.117	Agree (SA)

Based on Table 2, Vision emerged as the strongest dimension, with students demonstrating clear and motivating goals. Participatory Safety ranked second, showing that team environments were inclusive and psychologically safe. Task Orientation and Support for Innovation scored positively but slightly lower, suggesting room for growth in these areas while still maintaining generally favorable conditions.

3.1.2 AI Usage Patterns

Students predominantly utilized ChatGPT across multiple functions in their teamwork. They employed AI for generating creative concepts, such as event themes and rally game ideas, during brainstorming sessions. In addition, ChatGPT helped them in crafting and developing formal written communication, such as invitations and proposals.

Students also organize their task lists and schedules with the help of AI to ensure nothing gets left behind. Finally, they use ChatGPT to evaluate the various approaches suggested by team members so that all opinions are collected and decided among the team. This versatile application of AI tools demonstrated students' willingness to integrate technology into various aspects of their leadership camp preparation.

3.1.3 Correlation Analysis between AI Use and Team Climate

Emerging correlations were identified between AI usage patterns and perceptions of team climate dimensions, spanning:

1. High AI-assisted planning and brainstorming, such as event themes and rally game ideas, correlated with higher task orientation scores. Students reported that AI reduced uncertainty in planning, helping them focus on execution.
2. AI as a communication facilitator, such as drafting messages for discussions, which improves participatory safety, as it helps students to express their opinions more effectively.
3. Teams that used AI creatively for content, such as slogans and speech scripts, increased openness to ideas, which is greater support for innovation.

3.2 Discussion

The findings highlighted how artificial intelligence (AI) tools are becoming essential in leadership learning processes, especially in a student-led leadership project. The high scores in vision and participatory safety suggest that AI helped reinforce clarity and psychological safety, both critical for effective teamwork (Anderson & West, 1998). Additionally, AI functions primarily as a collaboration amplifier rather than replacing human leadership thinking. Teams that frequently used AI for task management and information synthesis showed stronger task orientation, aligning with prior studies which link digital tools to productivity and coordination (Xue et al., 2011).

AI provides dual benefits of creative support and organizational structure to student teams, mirroring previous research by Ahmad et al. (2023) on digital tools in team environments. The findings suggest that leadership development programs should incorporate training on purposeful AI integration as an emerging competency. Furthermore, the collaborative benefits noted align with Seibert et al. (2004), who highlighted the role of team climate in knowledge sharing. AI tools appeared to reinforce clarity and psychological safety, which are critical foundations for effective teamwork.

However, responsible AI integration was key. Teams that merely used AI for outputs, such as drafting only, without reflective discussions showed weaker innovation support than those engaging deeply with the technology. This suggests that meaningful engagement with AI, rather than simple utilization, is able to produce more beneficial outcomes. Therefore, rather than serving as a shortcut, thoughtful AI integration acted as a catalyst for improved team dynamics. It highlights the importance of AI literacy as a crucial leadership skill in collaborative settings.

4. CONCLUSION

This research emphasizes the transformative capabilities of Artificial Intelligence (AI) tools, including ChatGPT, in improving collaboration among teams and facilitating leadership learning in higher education. The incorporation of AI into team-oriented projects, such as the Department Camp Project, has been linked to enhanced aspects of team climate, like participative safety, a shared vision, and encouragement of innovation. These results add to the expanding body of empirical evidence regarding AI's function in educational environments, providing insights into how AI can be utilized to promote effective teamwork and develop leadership abilities among students.

For educators, these findings highlight the necessity of advocating for ethical and strategic implementations of AI tools in classroom settings. Creating AI-augmented learning activities that foster collaboration, critical thinking, and innovation can significantly enrich the learning experience. Nevertheless, the research also points out limitations, including the sample size and dependence on self-reported data, which may lead to biases. Future investigations should explore longitudinal studies and experimental frameworks to delve deeper into AI's effects on team interactions and educational outcomes. Furthermore, utilizing AI usage analytics can offer more objective indicators of AI's impact in educational settings. As AI technology progresses, continual research and ethical considerations will be vital for informing its integration into higher education.

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