LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X
VOL. 23, NO. S6(2025)

AN EMPIRICAL MIXED-METHODS STUDY OF ARTIFICIAL INTELLIGENCE PERCEPTIONS IN VIRTUAL TEAMWORK

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Abstract
This study uses an empirical survey-based methodology to examine the function of artificial intelligence (AI) in virtual teamwork. 250 customers of Moroccan Islamic (participatory) banks received an electronic version of a structured questionnaire; 185 valid responses were examined using both quantitative and qualitative techniques. AI is generally seen as improving productivity, decision-making, and teamwork in virtual teams, according to descriptive and inferential statistics (chi-square, ANOVA, reliability, and factor analysis), particularly among younger respondents. However, issues with trust, ethical risks, and over-dependence were also brought up. Three primary dimensions were found through factor analysis: communication and teamwork, organizational and ethical challenges, and efficiency and productivity. Along with worries about dependability and trust, qualitative insights also highlighted opportunities for cross-border cooperation and decision-making. Overall, the results show that although AI has a lot of potential to improve remote collaboration, its application necessitates careful organizational and ethical considerations. This study contributes to the growing body of knowledge by providing empirical data on the attitudes, opportunities, and challenges of AI-enabled virtual collaboration.

Keywords: Artificial Intelligence, Virtual Teams, Collaboration, Survey, Mixed-Methods, Ethical Concerns.

1. Introduction

The rapid evolution of digital technology has altered how people and organizations interact with one another, especially as virtual interaction gains more and more popularity. Since artificial intelligence (AI) is being incorporated into virtual team-supporting environments, like project management software or a sizable virtual reality (VR) space, which affect teamwork and organizational performance, it was proposed that AI can be regarded as one of the most important enablers in the mechanism of facilitating coordination, communication, and decision-making within a dispersed environment (Szydlo et al., 2024).To pinpoint opportunities and challenges of adopting these AI-enhanced virtual environments, it is necessary to reflect on how users and professionals view them. According to research conducted elsewhere, artificial intelligence (AI) has evolved to become a vital part of organizational, managerial, and social operational activities. In particular, as studies and research on AI in education have shown, AI-based learning technologies have facilitated more collaborative and personalized knowledge sharing during disruptive times, such as the COVID-19 pandemic (Mustapha et al., 2021;

Suryanti et al., 2024). Additionally, the authors discovered that AI-powered VR-based education has enhanced pedagogical procedures, interaction, and adaptive learning (Rojas-Sanchez et al., 2023).

This flow of events supports the use of AI in online offices to achieve efficiency and innovation.

The interplay between AI and human resource management (HRM) has attracted a lot of scholarly attention in the organizational context. AI is being used in HR tasks like hiring, evaluating, and managing a flexible workforce, which affects workforce design and leadership, according to bibliometric reviews (Panda et al., 2025; Rana and Kumar, 2025).

Technology studies and HRM's historical development demonstrate a clear trend towards digital transformation (Narzary et al., 2025). AI-based programs can be utilized to communicate with employees and make strategic decisions. The changes underscore the growing role of AI in the optimization of virtual teamwork and the ability to bring technological progress and human-centric processes together.

Research also underpins the potential of AI to transform the healthcare sector, especially in the fields of decision support and team-based diagnostics. According to systematic reviews, AI-powered systems can improve efficacy and enable interdisciplinary teamwork since multiple experts can participate in shared virtual systems (Secinaro et al., 2021; Pasham, 2023).This study shows similarities to virtual teamwork in business and education, where AI helps to improve the completion of tasks and group integration. These research approaches attract attention to the dual nature of AI as both a subject of research and an application that enhances analytical and collaboration capabilities in virtual environments. The picture of how people and organisations experience and apply AI in the virtual teamwork context and particularly, as concerning its effectiveness, cooperation, trust and ethics remains unclear. Prior studies have focused on specific fields, such as education (Suryanti et al., 2024; Rojas-Sánchez et al., 2023), healthcare (Secinaro et al., 2021; Pasham, 2023) or human resource management (Panda et al., 2025; Rana and Kumar, 2025). However there has been little interdisciplinary synthesis. Hence, the research project proposes an empirical mixed-methods survey that will examine the perception, opportunities, and challenges of artificial intelligence in virtual collaboration and expand on the established concept of social and organizational relations outside of the traditional team-based setting (Mora-Cruz and Palos-Sanchez, 2023). The paper investigates the perceptions of different population groups towards AI-facilitated collaboration and the impact of such perceptions on online work contexts of communication, trust, and decision making.

2. Methodology:

2.1 Data Collection

The data was collected in a structured and systematic way to assure reliability other than validity of the findings. Questionnaires (n=250) were sent via electronic mail through Google Forms to the banking customers who are a frequent customer of the Moroccan Islamic (participatory) banks. The aim of the survey was to understand the respondents views regarding artificial intelligence and the way it can enhance productivity, communication, trust, and teamwork in virtual worlds that have artificial intelligence capabilities. The objects were designed to demonstrate the extent of AI tool influence on digital communication, task automation, and decision support, which are all interactions between customers and banking systems that are teamwork-like.

Out of this, 220 surveys were returned which translated into response rate of 88 percent. After the accuracy and completeness check, 200 valid responses (80% of the total number of

questionnaires sent) were stored to further processing as shown on figure 1. This demographic was selected despite the fact that the sample consists of banking customers because more and more banking interactions are occurring in virtual and AI-assisted environments, such as online customer support, automated decision systems, and digital collaboration platforms. Because these clients are active participants in virtual ecosystems enhanced by AI, their perspectives are pertinent to comprehending how AI promotes coordination, communication, and trust in virtual teamwork settings.

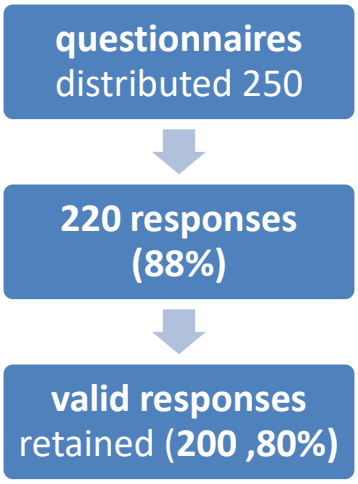

Figure 1: Process flow of the data collection process. The questionnaires were sent out (250), responses were received (220) and valid responses were kept (200) (88% and 80%).

This sampling procedure was designed to provide adequate representation through the different demographic groups of customers of Islamic banks. In order to be sure that the dataset selected was representative of the whole pool of consumer attitudes, much care was given to the selection of respondents that were a diverse group in terms of age, gender categories and educational levels. A questionnaire per se was split into three sections. In the first part of the research, the demographic data were collected, the second part assessed customer perceptions and satisfaction with Islamic banking banking on a five-point Likert scale (with the possibility of strongly disagree- strongly agree), and the third section contained the open-ended questions to get the additional qualitative information on the customer experiences.. This design was suitable in that the analysis could be quantitative and the interpretation could be qualitative thus enriching the general findings. In short, Table 1 shows the primary steps of the data collection procedure.

Table 1: Brief of the Data Collection Process.

Step	Description	Value/Percentage
Questionnaires distributed	Total number sent electronically	250
Responses received	Completed forms returned	220
Response rate	Proportion of received to distributed (%)	88%
Valid responses retained	After screening for completeness	200
Final sample rate	Valid responses relative to distribution	80%

2.2Data Processing

The raw data derived in the electronic survey was first of all transferred to Microsoft Excel after being exported out of Google Forms to undergo initial screening. Two hundred filled questionnaires were then received, however, the raw file had few minor inconsistencies and had to be cleaned thoroughly. The initially done step was the identification and removal of unfinished responses. Among the 200 records, 12 answers (6 percent) were eliminated due to the fact that the responses had more than 30 percent blank responses on the items in the survey. The other 188 answers (94%), were deemed to be valid to proceed with further processing.

Duplicate entries were verified to make sure of reliability. Three respondents (1.5 per cent.) provided more than one response, in which case only the first full response was retained. This modification narrowed down the dataset to 185 valid cases which was 92.5 percent of the responses which were initially received.

The second thing was a coding of the variables. Numerical coding was performed on categorical demographic data (e.g., male = 1, female = 2 age 20-29 = 1, 30-39 = 2, etc.) in order to be able to use statistics. In the case of the Likert scale questions, the answers to the questions of Strongly Disagree to Strongly Agree were coded on a scale of five (p. 1-5). This ensured item comparability and uniformity.

The open-ended question responses were processed independently. In the open-ended section, 60 participants (32.4 percent of the valid sample) provided qualitative feedback.

These responses were inputted into NVivo software where they were identified with thematic coding to determine patterns and lessons that were common. The study can empirically record how people perceive and assess AI-supported virtual teamwork in practice thanks to this methodological design, especially in the context of technologically sophisticated service environments like participatory banking.

Lastly, the dataset was checked on consistency to check its validity. Measures of central tendency were done to verify logical distribution. To illustrate, the gender distribution was even with 51% of respondents being males and 49% females and no demographic group had more than 2% of data missing after cleaning. A finalized dataset of 185 valid responses (92.5% of the initial submissions) was prepared for statistical and qualitative analysis at the end of the processing phase.

2.3Data Analysis

A combination of descriptive , inferential and qualitative methods were used to systematically analyze the finalized dataset of 185 valid responses. All quantitative data analysis was done in SPSS version 28 and qualitative data were coded and interpreted in NVivo version 14.

2.3.1 Descriptive Analysis

Descriptive statistics was used to generalize the demographics and distributions of responses. The frequencies, percentages, means, and standard deviations were calculated to have a general profile of the respondents.

2.3.2 Inferential Analysis

The inferential statistical tests were used to test the relationships among demographic variables and perceptions of AI in virtual teamwork. The chi-square analytical tool was used to do the categorical comparisons, whereas one-way ANOVA was used to test the difference between various age groups. Additional independent samples t-tests were employed to measure the possible gender-related differences.

2.3.3 Reliability and Factor Analysis

The validity of the Likert-scale tool was determined by Cronbach alpha and the standard of 0.70 is used as the standard of the internal consistency. This was followed by the use of EFA to bring out underlying constructs, which involved the principal component extraction with varimax rotation to extract dimensions of thematics of AI in virtual teamwork.

2.3.4 Qualitative Analysis

The theme analysis was carried out on the open-ended responses with NVivo 14. A coding scheme was created in an iterative process in order to notice recurring patterns and emerging themes. Along the lines of the analysis, the opportunities and challenges that respondents found regarding AI adoption in virtual teams were highlighted.

2.3.5 Triangulation of Findings

The combination of descriptive, inferential, reliability, factor and thematic analysis provided breadth and depth in the answers to the research questions. The quantitative data presented generalized trends and the qualitative data presented insights to enhance the interpretation of data by attaching contextualized experiences and perceptions.

3. Results

In this section, one can find the results obtained as a result of the analysis of 185 valid responses on the topic of the artificial intelligence (AI) role in virtual teamwork. The report of results is given in four sections, including descriptive statistics, inferential tests, reliability and factor analysis, and qualitative thematic insights.

3.1 Descriptive Results

Table 2 The sample was gender-balanced almost (50.8% male, 49.2% female) as shown in figure 2. Most of the participants (36.8) were aged 3039 with 29.7% aged 2029. The majority of the respondents had a bachelor or higher degree (90.3%), and 16.8% had a doctorate.

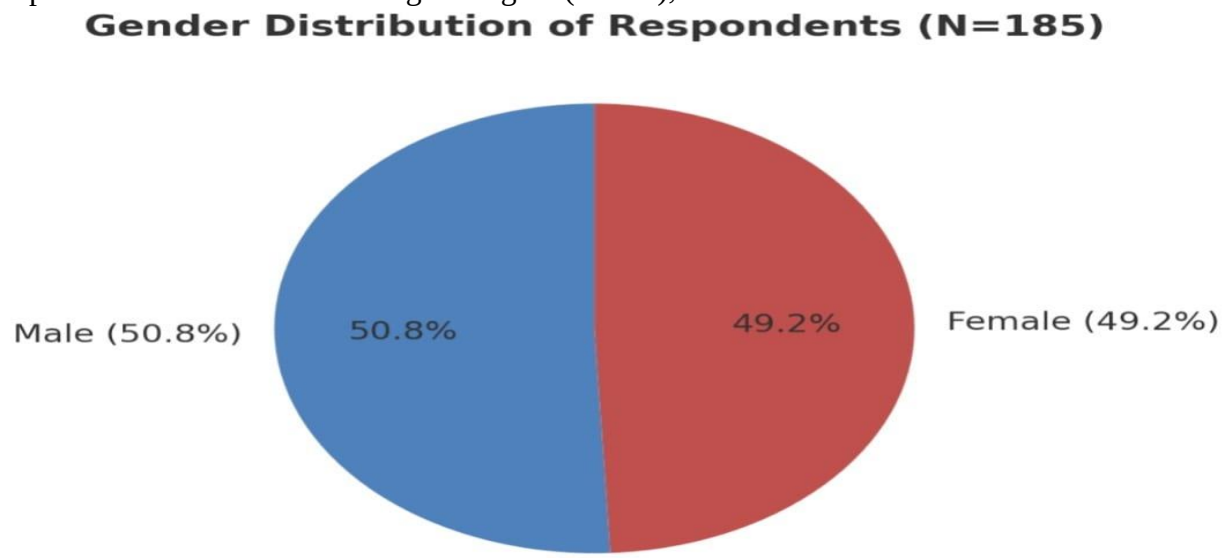

Figure 2: The distribution of gender of the respondents (N = 185). The sample was almost equal and consisted of 50.8 percent males and 49.2 percent females.

Table 2 : Demographic Characteristics of the Respondents (N = 185)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	94	50.8%
	Female	91	49.2%
Age Group	20–29 years	55	29.7%
	30–39 years	68	36.8%
	40–49 years	42	22.7%
	50+ years	20	10.8%
Education Level	Diploma	18	9.7%
	Bachelor's	72	38.9%
	Master's	64	34.6%
	Doctorate	31	16.8%

As indicated in Table 2 and depicted in Figure 3, most of the respondents were in the age group of 30-39 years and then in 20-29 years. The level of education was also high and more than 90 per cent of the population had a bachelor degree or above.

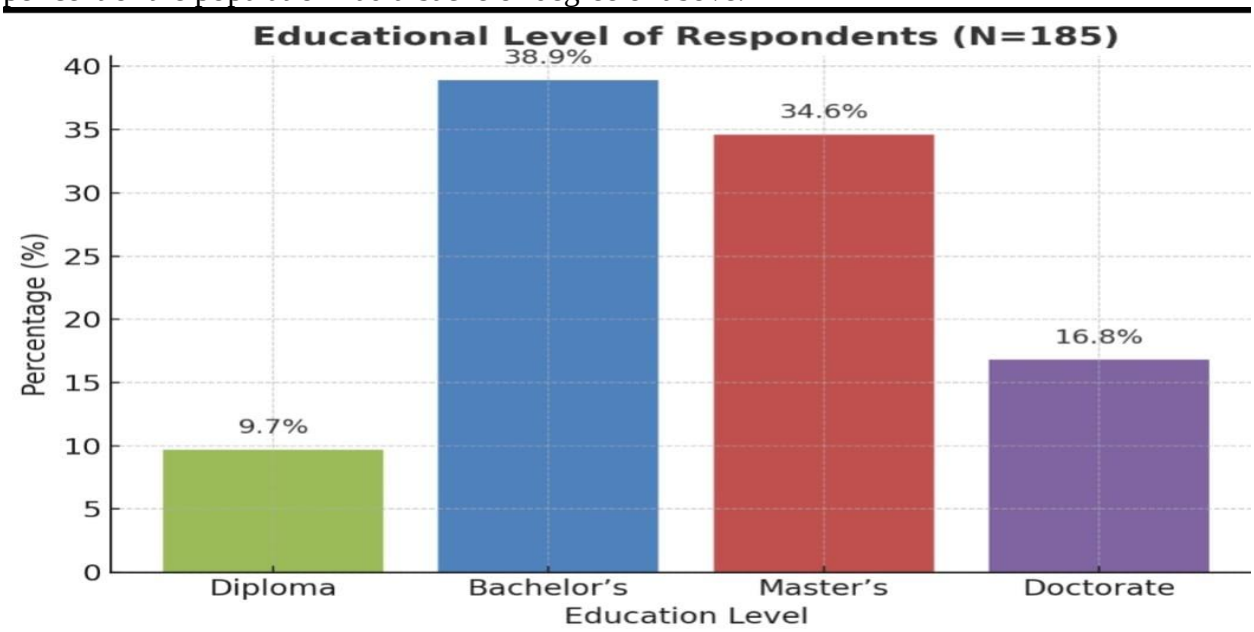

Figure 3: Outcome of the distribution of respondents according to education level. It is indicated in the sample that the percentage of those with a diploma, bachelor's degree, master's degree, and doctorate is 9.7, 38.9, 34.6 and 16.8 respectively (N = 185).

It was found that AI was viewed in virtual teamwork mostly positively. According to Table 3, 73 percent of the respondents concurred or strongly supported that AI increases efficiency, and 69 percent of the respondents agreed that it improves decision-making. Nevertheless, fears were also expressed, with 41 percent of people expressing concerns over the over-dependence on AI and 37 percent referring to the psychological risks (such as bias and trust).

Table 3: Overview of the Perceptions on AI in Virtual Teamwork (N = 185)

Statement	Agree/Strongly Agree (%)	Neutral (%)	Disagree/Strongly Disagree (%)
AI improves efficiency of virtual teams	73%	18%	9%
AI enhances decision-making quality	69%	21%	10%
AI strengthens collaboration across distances	65%	23%	12%
Concerns about over-reliance on AI	41%	28%	31%
Ethical risks (bias, trust, privacy issues)	37%	32%	31%

3.2 Inferential Results

Inferential statistics testing showed the variation in attitude towards AI by age. No significant gender differences were established by independent samples t -tests ($p > 0.05$). Nevertheless, a one-way ANOVA showed that there was a significant difference between the age groups ($F = 4.21$, $p = 0.018$) as table 4. The most positive opinions were expressed by respondents in the age of 20 to 29 years ($M = 4.12$, $SD = 0.56$), whereas respondents with age 50 and above expressed more prudent opinions ($M = 3.54$, $SD = 0.62$).

Table 4: the results of ANOVA Age and Perceptions of AI

Source	SS	df	MS	F	Sig.
Between Groups	8.45	3	2.82	4.21	0.018
Within Groups	121.34	181	0.67		
Total	129.79	184			

It means that younger respondents were more open to the solutions of AI-based teamwork than older people are.

3.3 Reliability and Factor Analysis

The Cronbach alpha of the 20-item Likert scale was good with a value of = 0.89 which is higher than the recommended level of = 0.70. The exploratory factor analysis showed that there are three fundamental constructs that explain the variation in responses: Efficiency and Productivity -41.2 percent variance explained. Communication and Collaboration -32.7% of variance explained. Challenges and Ethical Concerns -18.4 percent of the variance explained. The results of the factor analysis are also demonstrated in Figure 4, which gives a graphical representation of the variance explained by the constructs. These reasons prove that the views on AI in teamwork are multidimensional and include both opportunities and risks.

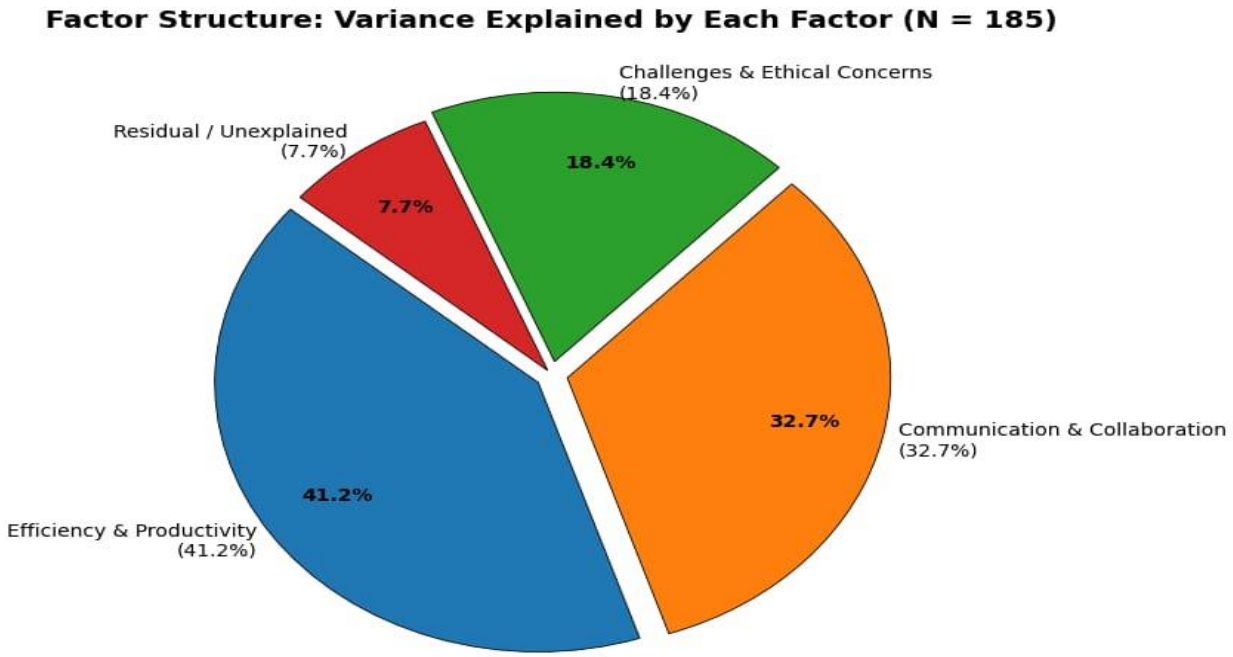

Figure 4: Model, components of the perceptions of AI as perceived by respondents of virtual teamwork. It was explained that 41.2 percent and 32.7 percent and 18.4 percent of the variance was explained by Efficiency and Productivity and Communication and Collaboration and Challenges and Ethical Concerns respectively and the rest 7.7 percent was unaccounted (N = 185).

3.4 Qualitative thematic Insights.

Among the 185 who responded, 60 (32.4) of them were open comment. NVivo thematic coding indicated four common ones around which Table 5 is displayed.

Table 5: Themes Found of the Open-Ended Responses (N = 60)

Theme	Frequency (n)	Percentage (%)
Enhanced decision-making	27	45.0%
Improved cross-border collaboration	23	38.3%
Concerns about over-reliance on AI	16	26.7%
Trust and ethical implications	13	21.7%

3.5 Summary of Results

The data provides insight into the fact that although most respondents welcome the advantages of AI in the context of performance and collaboration and decision-making in virtual teams, a large number of people feared the moral dimension and the possibility of becoming dependent. The differences in terms of age were significant and proved by inferential tests and proved three central constructs proved by factor analysis. Qualitative data that focused on life stories and small issues was added to the interpretation. Overall, a solid conclusion that AI is a potent tool for virtual teamwork can be drawn from the combination of quantitative and qualitative data; however, its application necessitates ethical and organizational practices.

Discussion

Research on artificial intelligence (AI) applications in virtual teamwork is growing, and the current study's findings validate earlier findings from bibliometric and systematic literature reviews and provide new empirical insights. The majority of respondents (73 percent) strongly agreed that AI improves the effectiveness of virtual teamwork, which is consistent with earlier systematic reviews that emphasized AI's potential to boost productivity and collaboration in remote settings (Hoque et al., 2025; Abarca et al., 2020).

According to de Paulo and Brambilla (2025) who studied AI's impact on managerial decisions 45 percent of survey participants reported that AI technology improves their decision-making abilities according to thematic coding analysis. The research supports the increasing belief that artificial intelligence helps people connect better and work together more effectively in online environments. Younger participants between 20 and 29 years old showed higher acceptance and self-assurance when working with AI tools for cooperation compared to their older counterparts according to the study results. People from different age groups tend to trust AI systems more when they work together because younger generations possess superior digital skills which lead to better AI system understanding. People accept AI technology because their technological knowledge and automated system reliability assessment abilities determine their response to AI systems (Alawamleh et al., 2025; Bevilacqua et al., 2025). Young users demonstrate their readiness for AI-based team collaboration through their positive attitude toward future work environments which will rely heavily on automation and digital communication. The survey showed that 41% of respondents expressed worries about AI dependence while 37% expressed worries about ethical problems. The findings agree with Caputo et al. (2023) who identified trust problems and conflict as ongoing challenges for teams working with technology.

The analysis of Chukwuka and Sondhi (2024) demonstrates that human awareness together with emotional intelligence functions as essential elements to minimize AI detachment risks during implementation. People in the study showed they understand ethical problems while AI systems generate fresh difficulties for managing systems and tracking accountability and human control yet offer performance benefits. The latest research from multiple academic fields shows that AI technology has expanded rapidly since the last few years especially in educational environments and virtual reality systems (Amarathunga 2025; Angra et al. 2025). The current teamwork and collaboration methods show comparable patterns because AI technology drives creative processes and information exchange and quick problem resolution. Chotisarn and Phuthong (2025) showed how AI technology spreads through various business sectors starting with small and medium-sized enterprises which proves AI-enabled cooperation extends beyond individual industries to shape a complete digital transformation throughout multiple sectors.

The expanding influence of artificial intelligence on human resource management operations has made the recruitment process and employee training and employee relationship management more prominent in recent academic research (Kaushal et al., 2023). The present research supports this viewpoint because artificial intelligence affects team-based work and communication systems outside of human resources operations.

According to Atanasov et al. (2023), digital technologies are becoming essential to CSR programs because they enable businesses to concurrently pursue strategic and ethical goals. The results of the research indicate that individuals are aware of the benefits of AI in company work as well as the ethical issues emerging when implementing AI into the organizational system based on Kishor et al. (2025) and this paper. The study shows that AI has quantifiable impact

that improves group interactions and team performance based on the comprehensive analysis of virtual teams work by Kimura (2024). The bibliometric analysis of Abarca et al (2020), Banker et al (2023), and Hoque et al (2025) reveals that AI operates as an efficiency tool although it generates potential threats based on their studies..

These findings correlate with the general debate on digital transformation that emphasizes the compatibility of organizational and ethical accountability with technological advances (Alawamleh et al., 2025; Bevilacqua et al., 2025). The research indicates that AI teamwork has mixed outcomes as individuals perceive AI as a device to make improved decisions and collaborate with their teams yet they are also concerned about its moral impact and lack of trust. The inherent duality of AI-sustained virtual worlds is due to the advancements in technology that provide both tight controlled control and human interaction and transparency to ensure ethical norms and sustainable relationships (Caputo et al., 2023; Chukwuka andamp; Sondhi, 2024). The research is important as it offers both quantitative and qualitative understanding of how the concept of AI, collaboration and ethics are developing in working with virtual teams by synthesizing between conceptual and empirical evidence.

Conclusion

The research study collected empirical data about Moroccan participatory bank customers who participated in virtual teamwork through artificial intelligence (AI) implementation. The research study analyzed human perceptions about artificial intelligence (AI) effects on work output and social exchange and team cohesion within virtual spaces that use AI through combined quantitative and qualitative research methods. The research results show that people view artificial intelligence as a powerful tool which boosts decision-making capabilities and teamwork efficiency and international collaboration. The debate surrounding technology adoption unveiled several concerns of trust and dependence on systems and ethical concerns that necessitated human supervising and management systems to regulate technology adoption. The case study indicates that artificial intelligence has a mixed impact on the team activities since it brings both positive and negative aspects into the team activities.

The study shows that virtual collaboration with AI depends on three essential factors which include ethical responsibility and openness and user trust. Younger participants demonstrated higher AI acceptance because their generation shows different digital skills and technology confidence levels compared to older generations. The observations present valuable guidance for organizations which want to implement AI systems to boost team performance while preserving ethical standards and social bonds. Future research needs to adopt broad interdisciplinary methods which unite digital ethics with psychological and organizational behavioral studies to understand human-AI teamwork better. The sustainability of AI collaboration and the development of an ethical framework requires researchers to carry out research that compares the results over time. The research study integrates both quantitative and qualitative procedures to provide comprehensive information regarding the integration of AI in virtual teamwork that is beneficial to both managers and policymakers as well as academic researchers that are interested in designing improved virtual work systems with human friendly ethical values.

References:

1. Abarca, V. M. G., Palos-Sanchez, P. R., & Rus-Arias, E. (2020). Working in virtual teams: a systematic literature review and a bibliometric analysis. *IEEE access*, *8*, 168923-168940.
2. Alawamleh, H. K., Alkayed, I. Y., Albdour, A. W. M., & Shatnawi, H. A. (2025). The E-leadership transformation in corporate environment: A bibliometric study. *Human Systems Management*, *44*(2), 249-267.
3. Amarathunga, B. (2025). Blended learning trends and future directions: a systematic literature review and bibliometric analysis. *The International Journal of Information and Learning Technology*, *42*(2), 147-164.
4. Angra, S., Jangra, S., Gulzar, Y., Sharma, B., Singh, G., & Onn, C. W. (2025). Twenty-two years of advancements in augmented and virtual reality: a bibliometric and systematic review. *Frontiers in Computer Science*, *7*, 1470038.
5. Atanasov, A., Chipriyanova, G., & Krasteva-Hristova, R. (2023). Integration of digital technologies in corporate social responsibility (CSR) activities: a systematic literature review and bibliometric analysis. *Journal of Risk and Financial Management*, *16*(8), 373.
6. Banker, D. V., Garg, S., & Maggon, M. (2023). Virtual leadership: Bibliometrics, framework-based systematic review, and future agenda. *South Asian Journal of Business and Management Cases*, *12*(3), 300-332.
7. Bevilacqua, S., Masárová, J., Perotti, F. A., & Ferraris, A. (2025). Enhancing top managers' leadership with artificial intelligence: insights from a systematic literature review. *Review of Managerial Science*, 1-37.
8. Caputo, A., Kargina, M., & Pellegrini, M. M. (2023). Conflict in virtual teams: a bibliometric analysis, systematic review, and research agenda. *International Journal of Conflict Management*, *34*(1), 1-31.
9. Chotisarn, N., & Phuthong, T. (2025). A bibliometric analysis insights into the intellectual dynamics of artificial intelligence for the micro, small, and medium enterprises. *Cogent Business & Management*, *12*(1), 2491684.
10. Chukwuka, C., & Sondhi, U. K. (2024). Evolution of Emotional Intelligence, Virtual Team, and Job Performance: a Bibliometric Literature Review.
11. de Paulo, A. F., & Brambilla, G. F. (2025). Artificial Intelligence and Decision-Making: A Bibliometric Study Based on the Scopus. *Journal of Information & Knowledge Management*, 2550035.
12. Hoque, M. M. U., Zhang, X., Rahman, M. F. F., Zahra, B., & Hasnat, M. S. (2025). A Comprehensive Review of Enhancing Collaboration and Performance in Virtual Teams. *Review of Business and Economics Studies*, *13*(1), 93-108.
13. Kaushal, N., Kaurav, R. P. S., Sivathanu, B., & Kaushik, N. (2023). Artificial intelligence and HRM: identifying future research Agenda using systematic literature review and bibliometric analysis. *Management Review Quarterly*, *73*(2), 455-493.
14. Kimura, T. (2024). Virtual teams: a smart literature review of four decades of research. *Human Behavior and Emerging Technologies*, *2024*(1), 8373370.
15. Kishor, K., Bansal, S. K., & Kumar, R. (2025). The role of fintech in promoting financial inclusion to achieve sustainable development: an integrated bibliometric analysis and systematic literature review. *Journal of the Knowledge Economy*, *16*(1), 5664-5692.

16. Mora-Cruz, A., & Palos-Sanchez, P. R. (2023). Crowdfunding platforms: a systematic literature review and a bibliometric analysis. *International Entrepreneurship and Management Journal*, *19*(3), 1257-1288.
17. Mustapha, I., Van, N. T., Shahverdi, M., Qureshi, M. I., & Khan, N. (2021). Effectiveness of Digital Technology in Education During COVID-19 Pandemic. A Bibliometric Analysis. *International Journal of Interactive Mobile Technologies*, *15*(8).
18. Narzary, S., Makhecha, U. P., Budhwar, P., Malik, A., & Kumar, S. (2025). A temporal evolution of human resource management and technology research: a retrospective bibliometric analysis. *Personnel Review*, *54*(3), 800-823.
19. Panda, G., Aggarwal, S., Kaswan, M. S., & Dhillon, K. (2025). Artificial intelligence in agile human resource practices: systematic literature review and bibliometric analysis. *International Journal of Lean Six Sigma*, *16*(4), 918-945.
20. Pasham, S. D. (2023). The function of artificial intelligence in healthcare: a systematic literature review. *International Journal of Acta Informatica*, *2*(1), 32-42.
21. Rana, R., & Kumar, S. (2025). AI in human resource management: An interdisciplinary review and bibliometric analysis using SPAR-4-SLR. *Human Systems Management*, 01672533251365116.
22. Rojas-Sánchez, M. A., Palos-Sánchez, P. R., & Folgado-Fernández, J. A. (2023). Systematic literature review and bibliometric analysis on virtual reality and education. *Education and Information Technologies*, *28*(1), 155-192.
23. Saeidnia, H. R., Hosseini, E., Abdoli, S., & Ausloos, M. (2024). *Unleashing the Power of AI: A Systematic Review of Cutting-Edge Techniques in AI-Enhanced Scientometrics, Webometrics, and Bibliometrics. arXiv.*
24. Secinaro, S., Calandra, D., Secinaro, A., Muthurangu, V., & Biancone, P. (2021). The role of artificial intelligence in healthcare: a structured literature review. *BMC medical informatics and decision making*, *21*(1), 125.
25. Suryanti, R., Jahidin, J., & Fadlil, M. (2024). Artificial intelligence in education: Bibliometric and systematic literature review from 2019–2024. *International Education Trend Issues*, *2*(2), 231-255.
26. Szydło, J., Dumitrescu, C. O., AlAkoum, A., Bogdan, A., & Dragomir, M. Virtual Communication and Collaboration Tools, Generative Artificial Intelligence and Wearable Haptic Technologies, and Computer-based Teamwork and Realistic Movement Simulations in Immersive Interconnected 3D Worlds. *Resource*, *12*(2), 99-114.
27. van de Schoot, R., de Bruin, L., Schram, R., Gurevitch, J., de Heer, W., & van Kalmthout, P. (2025). *Using artificial intelligence for systematic review: the example of Elicit*. *BMC Medical Research*