

Technology and AI's role in multicultural and digital leadership

Dan Paiuc, Center for Research in Management (CRM), Faculty of Management from the National University of Political Studies and Public Administration, Romania, dan.paiuc@facultateademangement.ro

Abstract

This research aims to present a systematic literature review focusing on technology and artificial intelligence (AI) as new vectors for multicultural and digital leadership. With 80% of companies using at least one emerging technology for finance and operations, 58% of firms increasing their spending in AI for workforce planning, and a big data market projected to be worth \$77 billion before the end of 2023, multicultural and digital leaders (ML; DL) have to adapt and acknowledge, integrate, and leverage technology into their daily business management (FinancesOnline, 2023). The conference paper intends to introduce an up-to-date systematic literature review and a bibliographic investigation performed with VOSviewer software, focusing on technology and AI as new vectors of multicultural and digital leadership. Mining into the Web of Science Core Collection database, our research creates an evident visual representation of the interconnectedness between technology, AI, ML, and DL. As the global business landscape increasingly values digital leadership, this bibliometric analysis offers valuable tools for multicultural and digital business leaders as well as academic researchers to comprehend, shape, and leverage the dynamics of these evolving domains.

Keywords

Multicultural leadership, Digital leadership, Technology, Artificial intelligence, Bibliometric study, Cultural intelligence.

Introduction

Throughout the early years of the 21st century, there were essential socio-technological shifts in the world, including the appearance of 24/7 portable smart devices and the extreme development of network connections, which resulted in a variety of attitudes towards the implementation of digital technologies in all spheres of socio-economic activities starting from education, research, lifestyle and ending with management (NLEC, 2021a; NLEC, 2021b). The landscape of communication, collaboration, and problem-solving is also transforming due to recent technology and AI's rapid development (Hofstede et al., 2010; Dennison, 2023). Concurrently, multicultural leadership, which entails effectively leading across diverse cultural contexts and perspectives (House et al., 2004; Javidan et al., 2006), is gaining prominence and is forced to adapt (Engelsberger et al., 2022).

Understanding the influence of technology and AI on multicultural leadership is essential because these findings will identify main themes and raise gaps and potential controversies that need to be acknowledged to build on them. Additionally, this review will deliberate on the implications for theory, practice, and future research in the realm of multicultural and digital leadership.

In recent years, technology has become a more and more present tool for multicultural leadership, starting to play a pivotal role in managing diverse teams, fostering inclusivity, and promoting cross-cultural collaboration (Deepu & Ravi, 2021; Eira, 2023). Enhanced communication and connectivity have permitted the bridging of geographical and cultural gaps. Platforms hosting video conferences, instant messaging, and project management tools enable leaders to interact with team members from diverse backgrounds effortlessly. Real-time communication promotes understanding, builds relationships, and mitigates miscommunication caused by language or cultural barriers (Klein, 2020). Secondly, technology provides access to a wealth of diverse perspectives and knowledge. Through social media, online forums, and digital content, multicultural leaders can explore various cultural narratives, tap into global trends, and broaden their understanding of different perspectives. This knowledge empowers leaders to make informed decisions, develop culturally sensitive strategies, and effectively engage with their multicultural teams (Berraies, 2019). Furthermore, technology enables leaders to create inclusive work environments. For instance, collaborative online platforms facilitate virtual teamwork, allowing employees to contribute irrespective of their physical location or time zones (Bratianu & Paiuc, 2023a). Additionally, technology facilitates cultural intelligence development. Language learning apps, virtual reality simulations, and online cultural sensitivity programs equip leaders with the necessary skills to navigate cross-cultural complexities (Bratianu & Paiuc, 2023b). Lastly, technology offers data-driven insights that

help leaders identify and address multicultural leadership challenges. Advanced analytics and AI tools provide valuable metrics for diversity, equity, and inclusion initiatives (World Economic Forum, 2022), assisting leaders in tracking progress, identifying zones for improvement, and ensuring fair representation of diverse voices (Abaker et al., 2019).

Our analysis objective is to conduct a systematic literature review and explore emerging vectors of ML and DL. The research question that guides our investigation is therefore:

RQ: Are technology and AI new vectors of multicultural and digital leadership?

Our upcoming analysis will start with a short introduction and explanation of the methodology employed. We will then conduct a comprehensive literature review using VOSviewer (Van Eck & Waltman, 2021) to gather valuable and updated insights. Subsequently, we will discuss the findings, and finally, we will conclude by sharing the implications and limitations of our current research.

Literature review

Technology and artificial intelligence (AI) advancements have revolutionized our communication, collaboration, and problem-solving approaches in diverse and global contexts (Hofstede et al., 2010; Dennison, 2023). As mentioned in the introduction, this new reality puts significant pressure on multicultural leaders as the significance of ML has grown, encompassing the known skills related to leading effectively across various cultures, values, and perspectives (House et al., 2004; Javidan et al., 2006).

How do technology and AI influence multicultural leadership practices and outcomes? The question's importance stems from technology and AI's profound impact on the interactions between multicultural leaders and their followers, stakeholders, and environments (Avolio et al., 2014; Chowdhury et al., 2022).

Technology and AI as Enablers of Multicultural Leadership

There is a significant potential for technology and AI to enhance multicultural and digital leadership skills and competencies through data-driven insights, feedback, and coaching (Ninan & Essandoh, 2020).

One significant aspect is applying technology and AI to self-assess cultural intelligence (Paiuc, 2021a), enabling leaders to pinpoint their strengths and areas for improvement and design individualized learning strategies (Ang et al., 2015). Multicultural leaders can improve their cross-cultural communication, collaboration, and conflict resolution skills by using real-time feedback, suggestions, and guidance from technology and AI (Ransbotham et al., 2021) – all based on predictive patterns.

In addition, technology and AI are crucial for empowering multicultural leaders to access and use various sources of knowledge, expertise, and insight from various cultures and perspectives, which can be seamlessly incorporated into their decision-making processes (Titareva, 2021). AI has transformed data analysis by offering insightful information about customer behavior, market dynamics, and business prospects. It streamlines company processes, boosts effectiveness, and even suggests how to cut expenses. These contributions show the transformative potential of technology and artificial intelligence in empowering multicultural leaders to manage the complexity of various contexts more skilfully and effectively (Smith et al., 2018).

Technology and AI as Challenges for Multicultural Leadership

Technology and AI present a few challenges and risks for multicultural and digital leadership, giving rise to issues such as bias, misunderstanding, and ethical dilemmas (Theodorou & Dignum, 2020). Numerous studies have raised concerns regarding the potential of technology and AI to introduce or amplify biases in data collection, analysis, and interpretation, thereby influencing the accuracy, validity, and fairness of multicultural leadership outcomes (Gentile et al., 2023).

Furthermore, technology and AI can contribute to misunderstanding or mistrust within multicultural teams or stakeholders by diminishing human interaction, empathy, and rapport or generating inappropriate or insensitive responses or recommendations (Avolio et al., 2014; Chowdhury et al., 2022).

Since Emotional AI assesses the emotional conditions of employees, incorporating biometric devices in work environments has sparked serious concerns. To investigate views regarding empathetic monitoring in their study,

Mantello et al., 2023, surveyed 1015 job candidates from 48 different nations. The study highlighted three key challenges with emotional artificial intelligence (EAI) on the job: privacy issues, lack of decision-making, openness, and automatic supervision focusing on employee conduct. Unrestrained EAI can worsen existing labor relations problems, particularly those based on socioeconomic status, gender, and culture. Further intercultural research is recommended to tackle the moral and societal ramifications of this cutting-edge innovation in non-human resource administration (Mantello et al., 2023).

Additionally, integrating technology and AI can confront multicultural leaders with ethical dilemmas as they navigate questions surrounding responsibility, accountability, and transparency in their actions and decisions — especially when moral or social values vary across cultures (Floridi et al., 2018; Jobin et al., 2019).

These observations emphasize the vital need for careful consideration and ethical scrutiny of integrating technology and AI in multicultural and digital leadership contexts. Addressing these challenges and risks is crucial to ensure equitable, empathetic, and ethically sound leadership practices across diverse cultural landscapes (Presbitero & Calleja, 2019).

Technology and AI as Opportunities for Multicultural Leadership

It is important to note how technology and AI open up new opportunities and demands for multicultural leadership (Arakpogun et al., 2021), particularly in fostering cross-cultural collaboration, innovation, and social impact. (Bristol-Faulhammer & Koudela, 2020). These technologies offer comparable platforms, resources, and guidelines that facilitate seamless collaboration (Hinds et al., 2015).

Technology and AI also foster creativity, diversity, and inclusion among multicultural teams and stakeholders, supporting cross-cultural innovation. The potential for innovative breakthroughs is increased by technology and AI by enabling people to develop new solutions for complex or wicked problems jointly (Bouncken et al., 2016; Naim et al., 2019).

Technology and AI can potentially significantly increase the social impact on people from different cultures. Multicultural leaders can use these technologies to address global challenges more effectively and comprehensively, like poverty, inequality, climate change, or health crises (WEF, 2022; Nkomo et al., 2020).

The emergence of technology and AI offers multicultural and digital leadership a previously unheard-of opportunity to thrive in tackling complex global issues, encouraging innovation, and making a positive social impact that cuts across cultural boundaries (Paiuc & Iliescu, 2022). By carefully utilizing these tools and approaches, multicultural leaders can realize their potential to create a more connected, equitable, and performant world.

Data source and methodology

We have employed a bibliometric approach, bolstered by the utilization of VOSviewer - (Van Eck & Waltman, 2021), to accomplish our research objectives. By employing bibliometric techniques, we are able to quantitatively analyze the scholarly output within multicultural, digital, and technology-related fields of study, thus facilitating a comprehensive assessment of the existing literature. VOSviewer further enables us to visually represent and analyze the relationships among scholarly publications, authors, and keywords, thereby providing valuable insights into the structure and evolution of the under-investigation research domains and correlations.

The data was retrieved on August 05, 2023, from the Web of Science (WoS) Core Collection database, a leading global scholarly literature bibliographic database and citation index (Tykhonkova, 2017), as presented in Table 1. The retrieval method used a standard search function, and the research time window covered the typical period from the platform's debut until the start of August 2023 (*). All of the remaining retrieval contexts were set to WoS default values. While the second, third, and fourth searched expressions related to leadership had a time span from their inception on WoS (ML for 1975 and DL from 1991) for artificial intelligence in order to reduce the record numbers from 35550 to 4008 and to focus on the more recent connections, we have targeted only on the year 2023 (till search date: 05.08.2023). The same approach was utilized furthermore for ML and DL, allowing us to have another more up-to-date perspective. Also, for the first and last expression, we have reduced the search to *titles* in order to focus more on the concepts as presented below:

Table 1: Returned results of main research concepts - on WoS

Searched expressions in WoS	Returned results	Searched fields	Time span
leadership	1836 *	titles *	(2023) 01.01.2023 till 05.08.2023 *
multicultural leadership	1088	all fields	1975 till 05.08.2023
digital leadership	5381	all fields	1991 till 05.08.2024
"digital leadership"	163	all fields	1991 till 05.08.2025
digital leadership	478 *	all fields	(2023) 01.01.2023 till 05.08.2023 *
artificial intelligence	4008 *	titles *	(2023) 01.01.2023 till 05.08.2023 *

Source: Author's own results

Items from WoS containing full record information were exported under plain text files. VOSviewer, with its version 1.6.19, was utilized to study and map keywords' co-occurrence, starting from the above-mentioned plain text files and using a full counting methodology. In these visualizations and maps, nodes, lines, distance between nodes, and line thickness play crucial roles. Nodes represent individual keywords or terms extracted from a dataset linked to our research concepts. The node's size can indicate the keyword's frequency or importance; larger nodes often mean more frequently mentioned terms. Lines between nodes portray the co-occurrence relationships between keywords. If two keywords frequently appear together in the same document, their co-occurrence strength increases. The thickness of the line indicates the strength of this relationship. Thicker lines represent stronger co-occurrence relationships, while thinner lines indicate weaker connections. The distance between nodes reflects the similarity of co-occurrence patterns between two keywords. Nodes that are closer together have similar co-occurrence relationships, suggesting that they are often mentioned together. Conversely, farther apart nodes have dissimilar co-occurrence patterns, indicating that they are rarely mentioned in the same context.

Results and discussions

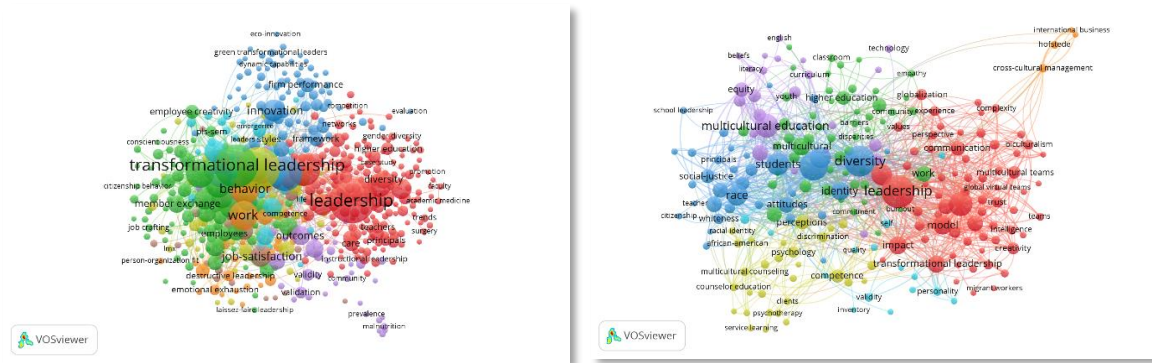
The presence of specific keywords appearing together – linked via VOSviewer co-occurrence process - indicates the current areas of interest in our researched fields, as explained in the methodology chapter. In all the 1088 ML-related publications, we gathered 3543 keywords altogether. Among them, 228 keywords appeared a minimum of 5 times and met the threshold, accounting for 6.43%. Table 2 presents all our keyword's co-occurrence results that rooted our analysis.

Table 2: Keywords meeting the threshold – built on data from Table 1

Researched expressions	Time span	Results [WoS]	Number of keywords [VOSViewer]	Keywords meeting the threshold for a minimum number of occurrences of a keyword of 5	Selected number of keywords as per VOSviewer suggestions
leadership	2023	1836	6073	519	519
multicultural leadership	1975 -2023	1088	3543	228	228
digital leadership	1991 -2023	5381	17874	1158	1000
"digital leadership"	1991 -2023	163	815	38	38
digital leadership	2023	478	2891	134	134
artificial intelligence	2023	4008	13038	740	740

Source: Author's own results

Figure 1.a. shows the general bibliometric map of ML, while Figure 1.b, shows a zoomed approach centered on multicultural leadership – as defined in Table 1:



1.a Leadership

1.b Multicultural leadership:

Figure 1: Keyword's co-occurrence network-related publications - by VOSviewer. [Source: authors' own research]

As represented by Figure 1.a, Leadership is connected with technology within the literature review; however, from total link strength of 31256; technology - represented by expressions containing the wording: *technology*, *digital*, *virtual*, *AI*, and back by *innovation* - accumulates a regrouped link strength of 1255, accounting for a 4% share in ML. These results are significant, considering that the first mentions recorded on WoS about leadership dates from 1975, while DL was first presented in the same database in 1991. In Figure 1.b, we deep dive into our analysis of multicultural leadership with a total link strength of 6700 and showcase that technology (represented by the same expressions utilized in Figure 1.a - analysis and with 155 link strength) is related to multicultural leadership, with a 2.31% share.

However, as mentioned by (Paiuc & Iliescu, 2022), in recent years following the COVID-19 pandemic period, “*digital leadership*” has highly increased in popularity (DL’s related publications in WoS from 2019 account for 81.5 % of total registered writings) – as presented in figure 2. Moreover, from this perspective, multicultural leadership powered by work-from-anywhere and virtual teams is recently embedded into DL (Eberl & Drews, 2021; Paiuc, 2021b).

2023	25	2019	14	2015	2
2022	48	2018	7	2004	1
2021	29	2017	10		
2020	17	2016	10		

Figure 2: Number of results per year for “digital leadership” search on WoS [Source: authors' own research]

As per DL's overlay visualization map below from DL's total link strength of 685, technology (represented only by *technology* and *digital*-related expressions) accounts for a link strength of 285, associated with a share of 41.6% (figure 3).

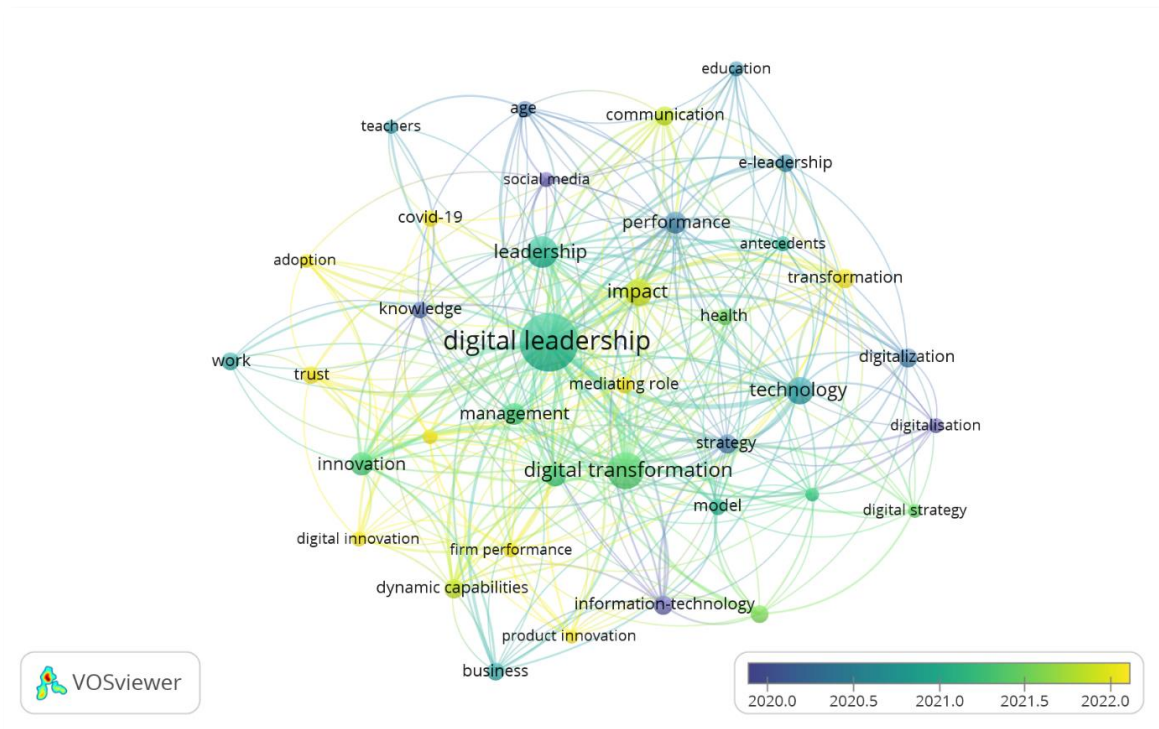


Figure 3: DL: Keyword's co-occurrence network-related publications – overlay visualization map- by VOSviewer [Source: authors' own research]

We are now analyzing the connection of (multicultural) leadership with AI based on artificial intelligence bibliometric map – as reflected in Figure 4.

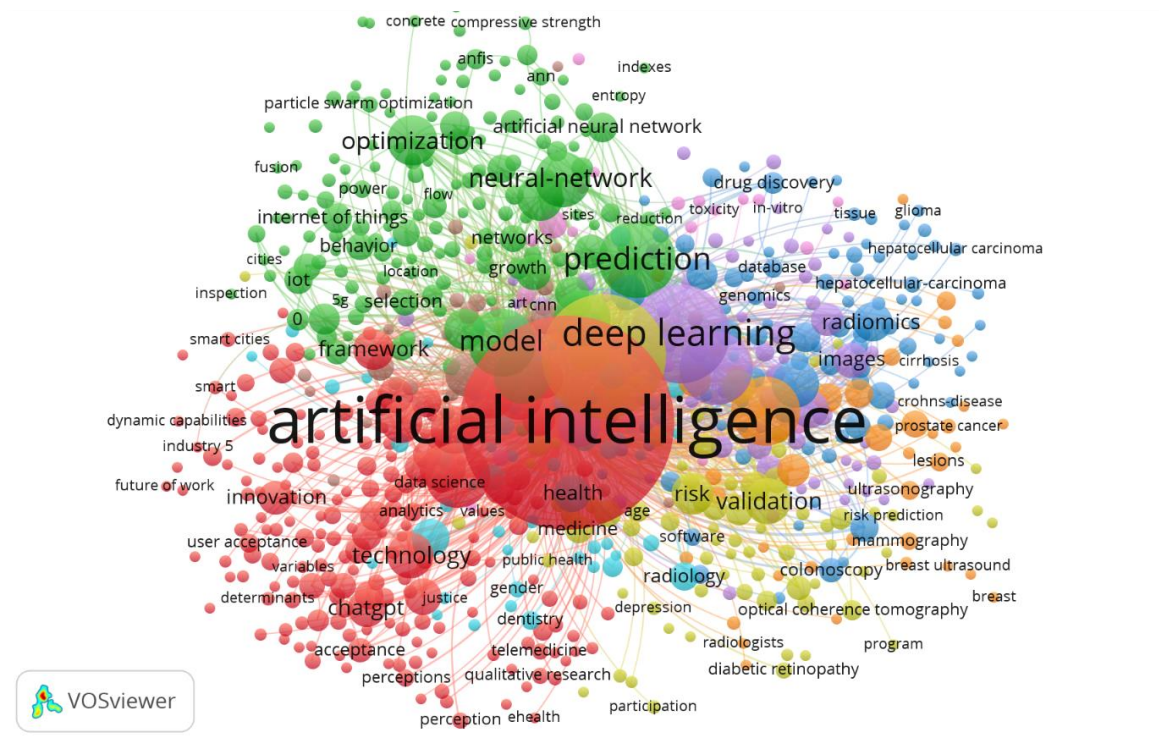


Figure 4: AI: Keyword's co-occurrence network-related publications - by VOSviewer [Source: authors' own research]

From a total AI link strength of 38088, multicultural leadership accounts for a share of 3.49% that could also be extended in taking into consideration also knowledge to 4.14%. Details are in table 3 below:

Table 3: Keyword's link strengths network of AI-related publications - by VOSviewer

Researched expressions in AI map	Regrouped under:	Link strength	Link strength share in total AI link strength of 38088
leadership	Leadership, management and its main functions	41	3.37%
management		849	
to govern		124	
to control		69	
to guide		117	
to program		37	
to regulate		48	
culture	culture	47	0.12%
knowledge	knowledge	246	0.65%
Total			4.14%

Source: Author's own results

At this stage, we have answered our research question and demonstrated the deep and growing connection between technology and AI and multicultural and digital leadership.

Discussions

Gartner, a top research and advisory corporation, has pinpointed five "hype cycles" that describe the typical trajectory of emerging technologies, including AI (Züger et al., 2023). The first stage is the "Technology Innovation Trigger," where new technology catches attention and generates excitement. This is followed by the "Peak of Inflated Expectations," portrayed by excessive hype and unrealistic expectations about the technology's capabilities. Subsequently, there is a "Trough of Disillusionment," where disillusionment and scepticism set in due to the technology's limitations and challenges. The technology then enters the "Slope of Enlightenment", as practical applications and benefits emerge, leading to mainstream adoption in the "Plateau of Productivity". Contextualising our research findings, we are at just after the stage where the hype bubble popped and the cynical attitude about innovation is mitigated by day-to-day increasing benefits. While academic life started to integrate AI with the notorious examples of Vanderbilt and Arizona State universities that build on the utilization of ChatGPT for generating intelligent queries and the University of Amsterdam that arranges workshops to educate individuals on effectively utilizing AI, the multicultural and digital leadership moved one step further into the integration of the AI support. According to Sahul Hameed (Hameed, 2024) AI already provide support for leaders within the topics: presentations (Prezent); writing and transcription (ChatGPT; Grammarly; Otter.ai); talent acquisition (Attract.ai; HireVue); customer support (Effy.ai); sales (Gong); team workload management (Monday.com); data analytics (Lattice and even knowledge management (Talla.ai).

The diffusion of innovation theory, developed by Everett Rogers, explains how new ideas, technologies, and innovations spread and are adopted within a society or social system (Rogers, 2010). In the context of technology and AI, this theory suggests that adopting and accepting these innovations depends on factors such as perceived benefits, compatibility with existing systems, complexity, observability, and the influence of opinion leaders. It emphasises the importance of communication channels and social networks in facilitating the diffusion process and influencing individual and collective decision-making regarding adopting technology and AI. Or now AI with all its media management enhancements powered by virtual assistants and Chatbots, has just took over the communication and social channels, providing ML with the most agile knowledge sharing management instruments (Zhang et al., 2023) and enhancing on the relevance of this study to networked learning theory and practice.

The bibliometric analysis has limitations because AI has just recently started to interact with and impact multicultural and digital leadership, taking into account that ChatGPT was launched on November 30, 2022.

Starting from the technological and AI demands of actual leaders, rooted in their daily deliverables, future research, based on interviews with decision-making managers and quantitative studies, should directly investigate the actual and potential future impact of technology and AI on ML and DL and quantify its growing influence and potential. Also, our future study will analyse more into details the other side of the technology coin, meaning the equity, access and hardcoded biases of AI in digital systems and matrixes as management support tools.

Conclusions, limitations, and future research areas

We have responded to our investigation question and have demonstrated via our bibliometric research that technology and AI have become growing vectors of multicultural and digital leadership. Multicultural leadership is significantly impacted by technology and AI, with both positive and negative results. Technology provides valuable tools for learning and development in multicultural contexts, on the one hand, strengthening multicultural leadership skills and competencies by offering data-driven insights, feedback, and coaching (Ang et al., 2015). However, this improvement calls for multicultural leaders to be on the lookout for any potential biases, mistakes, or limitations in technology and AI and to critically assess the data and guidance they receive (Gentile et al., 2023). It is crucial to recognize that technology and AI cannot replace for now human judgment, intuition, or emotion within multicultural leadership; instead, they should complement and support these essential aspects (Avolio et al., 2014; Chowdhury et al., 2022).

On the other hand, technology and AI also pose challenges and risks for multicultural leadership, giving rise to bias, misunderstanding, and ethical dilemmas. This underscores the urgent need for further research to prevent, detect, and mitigate the adverse effects of technology and AI on multicultural leadership outcomes (Gentile et al., 2023). Additionally, this situation calls for increased education and training on the responsible, ethical, and culturally sensitive use of technology and AI in multicultural settings (Floridi et al., 2018; Jobin et al., 2019). In the coming years, we can predict more advanced technologies to stir up the global market, like IoT, 5G networks, and augmented reality, and it is equally vital to foster dialogue and collaboration among multicultural leaders, followers, stakeholders, and technology and AI developers to ensure that their values, interests, and expectations are aligned and respected (Hinds et al., 2015).

Nevertheless, technology and AI create new opportunities and demands for multicultural leadership, serving as enablers of cross-cultural collaboration, innovation, and social impact. This finding underscores their potential to facilitate positive change and transformation in multicultural contexts (Bouncken et al., 2016; Naim et al., 2019). However, it also points to the necessity for multicultural leaders to be well-prepared for the challenges and uncertainties that come with technology and AI-driven innovation and social impact (WEF, 2022; Nkomo et al., 2020). Developing a vision and strategy for leveraging technology and AI to create value and meaning in a diverse and dynamic world becomes paramount for effective multicultural leadership (House et al., 2004; Javidan et al., 2006) and represents our near future research area.

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Author's contact details & brief CV:

Dan Paiuc has a Phd in Management at the *National University of Political Studies and Public Administration*, Romania, and is C-level practitioner within the international retail scene. He focuses on cultural intelligence and knowledge dynamics as main drivers of multicultural leadership and has published several papers in prestigious international journals and conference proceedings.

dan.paiuc@facultateademangement.ro / www.linkedin.com/in/dan-paiuc