Enhancing Digital Leadership and Crisis Management Skills for Advancing Sustainable Development Goals

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ABSTRACT

The study's relevance lies in the need to develop leaders' digital competences to achieve sustainable development goals. The article aims to study the role of digital leadership and crisis management training as tools for achieving sustainable development goals in digital transformation. The study uses literature analysis, generalisation, systematisation, statistical data analysis and forecasting to determine the role of digital leadership and crisis management training in digital transformation and sustainable development. The results of the analysis of changes in the level of digital skills show a stable trend towards a decrease in the share of people with a high level of information (by 9.24%) and communication (by 10.06%) skills, as well as digital content creation skills (by 14.38%) in 2023. However, forecasting indicators for the following periods revealed the possibility of a further increase in the level of digital skills in 2025, in particular information (by 2.13%), communication (by 1.19%), and digital content creation skills (by 4.68%). Digital leadership is an important component for ensuring progress in achieving the Sustainable Development Goals, as it contributes to developing key skills necessary for the resilience of organisations and society as a whole in the face of global challenges.

Increasing digitalisation in all sectors of the economy requires the generation of new leadership concepts in the digital environment and prioritising new methods to create future leaders (Temelkova, 2018). Therefore, digital leadership is now perceived as a key factor for

successful digital transformation in the real business world. Digital leaders need various skills, including those related to digital technologies (information, media and ICT literacy skills, problem-solving, communication and collaboration skills), critical thinking skills and people management skills (Van Laar et al., 2017). In addition, recent research by Broadridge indicates that more than half of digital leaders (53%) consider increased revenue to be one of the most important benefits of digital transformation, and more than 27% of the total budgets of modern IT companies are allocated to digital transformation (Steves, 2023). Hence, to understand the concept of digital leadership related to digital transformation, leaders must continue to practice and develop through both short-term and long-term training programmes (Promsri, 2019). Given this, this research article aims to study the importance and effectiveness of digital leadership and crisis management training as key components in the development of leaders' digital skills to achieve sustainable development goals, in particular in the context of adapting to the challenges of digital transformation, developing innovative management approaches and increasing the ability of organisations and society to respond effectively to crises.

Literature Review

As Cortellazzo et al. (2019) note, digital leadership is the ability of managers to use digital technologies to shape development strategies, maximise management effectiveness, and enhance organisations' adaptability to crisis conditions. According to Orieno et al. (2024), digital leaders' most priority competences are strategic thinking, change management, and innovation, given their applicability to ensuring organisational sustainability. In the context of sustainable development, leadership means a leader's ability to implement sustainable development principles into the organisation's core values, vision, and activities (Liao, 2022) in the long term, which involves considering the environmental impact of decisions and involving stakeholders in sustainable initiatives (Moleka, 2023). In this context, Opatska et al. (2024) examine the relevance of crisis leadership. Unlike digital leadership, it includes specific tasks, including understanding the crisis, making the right decisions to resolve it, formulating the crisis to stakeholders, resolving the crisis and restoring the normal functioning of the organisation, and training in preventing and resolving the consequences of the crisis. The authors note that implementing such tasks (as in the case of digital leadership) depends on leaders' leadership skills and emotional intelligence. Thus, it is important to emphasise the possibilities of synergy between crisis and digital leadership in modern conditions. In order to achieve sustainable development goals, the synergy between digital leadership and crisis management is important. According to Benitez et al. (2022), Mialkovska et al. (2023b), Pilipczuk (2021), and Temelkova (2020), approaches such as network management, utilisation of big data, automation of processes, and creation of digital platforms have the potential to expedite the process of adapting to change. In this context, studies by Abbatiello et al. (2017), Mialkovska et al. (2024a), Promsri (2019), Utegulova (2023), Temelkova (2018) highlight the importance of learning programmes that cultivate digital abilities and leadership qualities, as well as the formulation of anti-crisis strategies, considering the environmental, economic, and social aspects of sustainable development. Mialkovska et al. (2023a) reveal the main problems of modern digital leadership curricula: perceptions of trust, time constraints, privacy and data security issues, institutional policies

and guidelines, lack of incentives and recognition, technical barriers and digital literacy, disciplinary norms and traditions. Klus and Müller (2021) also highlight the need to match employees with different levels of technological ability, employees' fear and insecurity in the face of rapid change, and the importance of quick decisions in a fast-paced environment. In addition, given that digital transformation has potentially negative consequences, including the spread of stereotypes, one-sided perceptions and misinformation, anti-crisis measures are becoming more relevant (Mialkovska et al., 2024b). Effective crisis management ensures slow change and ongoing assessment of the situation, and crisis communications ensure clear strategies for interaction through multichannel platforms, avoidance of the spread of panic, and an active fight against fake information (Vos, 2017). That is why Bolden et al. (2023) and Sheninger (2019) note that interdisciplinary approaches that combine economic, managerial, technological and social aspects currently dominate digital leadership and crisis management education. The authors of these papers also analyse the successful practices of companies that use digital technologies to support sustainable development and evaluate the effectiveness of training programmes for future leaders in this area.

Method

The following methods were used in the research:

–   The analysis of literature sources was used to determine the essence of digital leadership and crisis management training in achieving sustainable development goals;

–   The generalisation method was used to determine the role of digital leadership and crisis management training in developing the relevant digital skills of leaders to achieve sustainable development goals;

–   The systematisation method was used to determine the relevance of digital skills training in the context of digital transformation;

–   The analysis of statistical data was used to generate initial data and to justify the need to conduct a quantitative analysis of the readiness of society to implement innovative approaches to leadership and crisis management;

–   The forecasting method was used to calculate the planned indicators for the further development of the digital educational environment, particularly training in digital leadership and crisis management.

Results

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations (UN) in 2015 as a universal call to action to reduce poverty, protect the planet and ensure that by 2030 all people live in peace and prosperity (United Nations, 2024). In terms of sustainability and stable economic growth, which should be ensured by organisations through continuous improvement of technology, productivity growth and crisis prevention, this has a direct link to several of the UN Sustainable Development Goals, including SDG 8, which advocates for sustained, inclusive and resilient economic growth, and SDG 12, which promotes responsible consumption and production patterns (Zervas & Stiakakis, 2024). The UN also notes that achieving the SDGs in every context requires creativity, know-how, technology and financial resources from all of society (United Nations, 2024). Given that digitalisation is significantly changing management processes, requiring

leaders to be technically competent in adaptive thinking, strategic vision and rapid response in the face of uncertainty, digital leadership competences are crucial to ensuring progress towards the SDGs. Moreover, due to technological advances, digital skills are essential for organisations to survive and thrive in a rapidly changing world. Simultaneously, sustainability is emerging as a crucial factor in determining an organisation's capacity to remain competitive and provide value to stakeholders over the long term (Gürbüz et al., 2022). It is critical to achieve organisational resilience to develop competences such as managing virtual teams, countering disinformation, and flexible management in the face of change. As a part of leadership skills, crisis management also involves handling current crises and preparing strategically for their avoidance, assessing potential hazards and constructing sustainable response mechanisms.

Therefore, given that digital technologies now necessitate specific competences and expertise from leaders, it is imperative for leaders to comprehend the evolving business environment and possess sufficient technical expertise and practical experience to respond to current crises and transformational processes effectively (Abbatiello et al., 2017) The importance of developing adaptive crisis management skills in the process of digital leadership education is also to take into account the importance of developing crisis management skills. Crisis management refers to processes that aim to recognise, investigate and anticipate potential crises. Furthermore, the objective of crisis management is to devise distinctive strategies that enable an organisation to either avert a crisis altogether or, in the event of a crisis, to overcome it with minimal adverse effects and resume normalcy as expeditiously as possible (Asemah-Ibrahim et al., 2022). Thus, crisis management training includes the acquisition of skills aimed at coping with a system in crisis.

The development of digital leaders necessitates implementing a comprehensive learning approach that integrates theoretical knowledge and practical skills essential for adapting to the rapidly evolving digital environment. Digital leadership education programmes ought to consider current challenges, such as the necessity for swift decision-making, managing virtual teams, countering disinformation, and implementing novel strategies for sustainable development (Bolden et al., 2023; Mialkovska et al., 2024b; Sheninger, 2019; Vos, 2017). A key aspect of learning is to create conditions for developing critical thinking, strategic vision and the ability to manage change, focusing on long-term goals (Van Laar et al., 2017). Interactive methods, crisis simulations, and interdisciplinary approaches contribute to developing competences required for a digital leader (Cortellazzo et al., 2019). In this context, integrating digital platforms and tools that consider the technical aspects and the social and ethical consequences of digitalisation is important. Their integration will contribute to a qualitative increase in the effectiveness of digital learning. Advanced programmes are a priority, given the possibility of ensuring a satisfactory level of innovation capacity and economic, social and environmental sustainability; as a result, they are the basis for the large-scale development of digital skills in society.

At the end of November 2023, the Chief Digital Transformation Officer (CDTO) Campus project was launched in Ukraine to accelerate the country's digital transformation. The position of CDTO was also introduced in ministries and at the regional level. It is announced that this project will train civil servants working in the field of digital transformation, which will provide the state with specialists qualified to lead and implement digital reforms. CDTO

Campus offers educational programmes designed specifically for digital transformation professionals in the public sector. The range of topics is quite broad, including digital strategy development, practical aspects of building digital infrastructure, building digital teams, and developing customised solutions for public sector organisations. However, the programme is aimed at civil servants involved in digital transformation, and it is available to private sector professionals only if they want to change their field of activity and move to public administration. Of course, it is still difficult to assess the effectiveness of this programme, but it is clear that without the necessary training of digital leaders in the private sector and without improving the digital skills of the general population, such programmes may be isolated and not contribute to a fundamental systemic digital transformation of society.

However, digital leadership challenges are not unique to Ukraine. For example, the EU's average proficiency rate in basic and advanced digital skills was 53.84% as of 2021 (Fintech Insider, 2024). For comparison, Ukraine reached a similar level in 2023, which indicates significant progress in the development of digital competences and also demonstrates the need for further improvement to be competitive. Continuing the discussion of the current European situation, in 2023, 55% of people in the EU aged 16 to 74 had at least basic generic digital skills. There was considerable variation across the EU, with the Netherlands (83%), Finland (82%) and Denmark (70%) showing the highest rates. In comparison, Romania (28%) and Bulgaria (36%) had the lowest levels of digital skills in the EU (Eurostat, 2024).

To justify the need for a quantitative analysis of society's readiness to implement innovative leadership and crisis management approaches, it is important to analyse the level of digital skills among the working population. The initial data for this analysis are the reports of the Ministry of Digital Transformation of Ukraine for 2021-2023. The criteria for the analysis were key digital competences, which are the basis for developing modern digital leadership education programmes. The downward trend in the proportion of people with high digital skills and the upward trend in the proportion of those without such skills, as shown in Table 1, indicates the problem of inequality in access to digital technologies between different population groups, including by age, education level, and place of residence. According to Figure 1, 46.50% of respondents in urban areas consider digital skills training relevant to some extent. In comparison, in rural areas, this figure is only 39.60% due to unequal access to digital technologies, differences in educational opportunities, and the level of awareness of the importance of digital literacy for personal and professional development.

Figure 1

The Relevance of Digital Skills Training
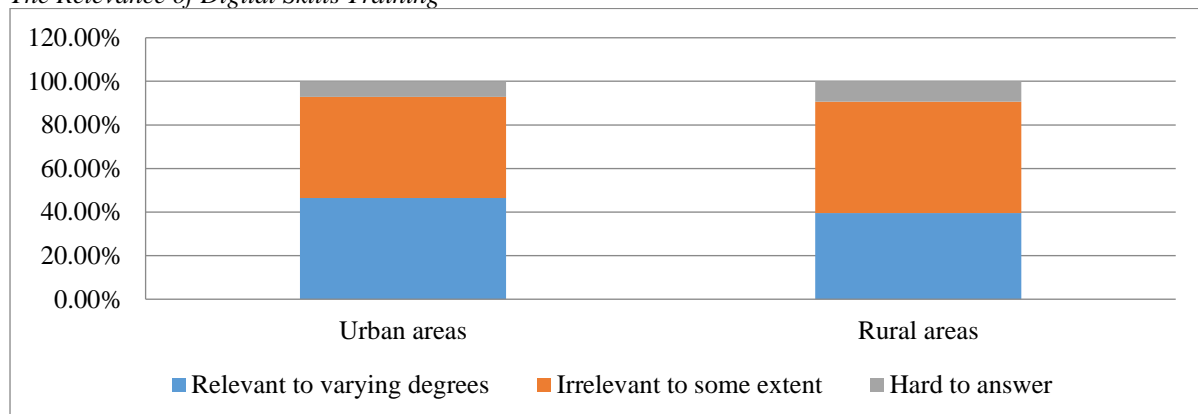
Source: *Diia.Education (2021)*

At the same time, the low level of information and communication skills limits the effectiveness of digital learning, which affects the opportunities for quality education (in line with SDG 4) and the formation of skilled personnel for the labour market. Thus, this situation necessitates adapting educational programmes to develop competences to increase digital literacy. To formulate our ideas about further developing the digital educational environment, which involves training in digital leadership and crisis management, we forecasted the indicators shown in Table 1 for the following two periods using FORECAST.ETS function of the Excel statistical analysis package.

Table 1

The General Level of Digital Skills

Period	Levels of digital skills											
	Information skills			Communication skills			Life problem-solving skills			Digital content creation skills		
	Beyond basic skills	Basic skills	No skills (no skills)	Beyond basic skills	Basic skills	No skills	Beyond basic skills	Basic skills	No skills	Beyond basic skills	Basic skills	No skills
2021	86.10%	4.80%	9.10%	87.90%	3.40%	8.70%	61.20%	25.00%	13.80%	41.20%	19.00%	39.80%
2022	77.86%	4.82%	17.32%	78.70%	5.16%	16.14%	55.58%	26.18%	18.22%	36.88%	18.48%	44.64%
2023	73.52%	6.42%	18.46%	74.18%	5.04%	18.94%	54.78%	24.98%	20.22%	26.96%	18.02%	53.22%
2024*	66.73%	7.03%	24.06%	66.72%	6.10%	24.66%	50.95%	25.28%	23.74%	20.56%	17.52%	59.45%
2025*	75.08%	7.92%	27.13%	75.06%	6.88%	27.82%	57.35%	28.47%	26.77%	23.08%	19.73%	67.02%

Note. **Source:** Compiled by the author based on Diia.Education (2019), Diia.Education (2021), Diia.Education (2023).

The analysis results of changes in the level of digital skills demonstrate a stable downward trend in the proportion of people with high (above basic) skills in the categories of information, communication, and digital content creation skills. In particular, the projected decrease in the level of higher skills in digital content creation to 20.56% in 2024 and the increase in the proportion of people without these skills to 67.02% in 2025, presented in Diia. Education indicates an urgent need to implement a systematic approach to digital learning. At the same time, the decline in projected values for life problem-solving skills (50.95%) and information skills (66.73%) in 2024 highlights the need to actively engage digital leaders in crisis management. It should also be noted that digital leadership is a crucial factor in creating the conditions for developing these skills, as it provides vision, innovation and a strategic approach to introducing digital technologies in various fields. Therefore, based on the study's findings, Ukraine possesses a rather intricate landscape for advancing digital leadership, accompanied by a decline in several significant digital competences among its populace. It is important to emphasise that digital leadership is integral to achieving sustainable development goals. This is because digital management stimulates the development of digital proficiency, adaptability to challenges and social advancements. As a result, the quality of digital leadership in Ukraine is not fundamentally low. However, it must be improved to eliminate the persistent trend towards declining digital skills. The forecasting results revealed a decrease in the share of individuals with high digital competences. This situation indicates the need to introduce a systemic approach to developing digital leadership. Given the above problems and prospects, digital leadership in Ukraine can become a tool for implementing digital transformation strategies, increasing anti-crisis resilience and achieving sustainable development goals.

Digital leadership involves the ability of leaders to effectively adapt to technological change, using modern digital tools to manage and implement innovations in their organisations. Given this, in modern conditions, leading digital leaders need to develop

relevant skills to respond to current challenges and form further strategies for the organisation's development. Abbatiello et al. (2017) propose a model for implementing a systems approach to identifying key skills of digital leaders. The authors focus on cognitive, behavioural and emotional skills. Leaders should develop these skill groups to solve complex problems in crisis conditions and achieve strategic goals. Relevant skill groups include:

1. Cognitive skills are the foundation for effective decision-making in a digital environment. By developing cognitive skills, digital leaders gain the ability to conceptualise priorities in a virtual environment and, as a result, identify new strategies for increasing productivity and innovative approaches to management. Working on problems with high cognitive complexity allows for increased adaptability of leaders and the organisation to a changing technological environment. In addition, developing divergent thinking is important in this group to ensure that leaders make informed decisions in stressful situations quickly.

2. Behavioral skills focus on the ability of leaders to adapt to a changing environment, which is accompanied not only by technological (as in the previous group) but also by organisational changes. If they are developed, digital leaders acquire the ability to collaborate across teams effectively. Such collaboration involves considering the contribution of new partners and stakeholders when managing changes in team dynamics. In addition, this group of skills also includes the ability to qualitatively redistribute or spend a large amount of effort to achieve success since change processes often require systematic adaptation.

3. Emotional skills include the ability of leaders to cope with risks and uncertainty in the context of digitalisation. As a result of the development of skills in this group, digital leaders are resistant to constant change and can maintain emotional balance. This allows top leaders to manage difficult situations in crisis and maintain team morale. Such leaders demonstrate confidence in their ability to make the organisation productive even in conditions of constant change. This approach to developing digital leadership training contributes to adequate task performance and achieving the organisation's strategic goals.

The abilities of digital leaders are crucial for ensuring the long-term viability of organisations in the digital age. Acquiring cognitive, behavioural, and emotional skills facilitates leaders' ability to adapt to change, innovate, make strategic decisions, and effectively respond to crises or unforeseen circumstances. In this context, training in digital leadership and crisis management is key to achieving the Sustainable Development Goals, as only leaders with such skills can ensure effective management in the face of uncertainty and rapid change caused by digital innovation. However, it should also be noted that certain obstacles exist to developing such skills. In particular, a study by Goran et al. (2017) surveyed 2,135 business leaders and found that cultural and behavioural challenges are the single most important indicator for leaders to achieve the relevant skills required in the context of digital transformation and sustainability (Figure 2).

Figure 2

Key Barriers to Digital Leadership
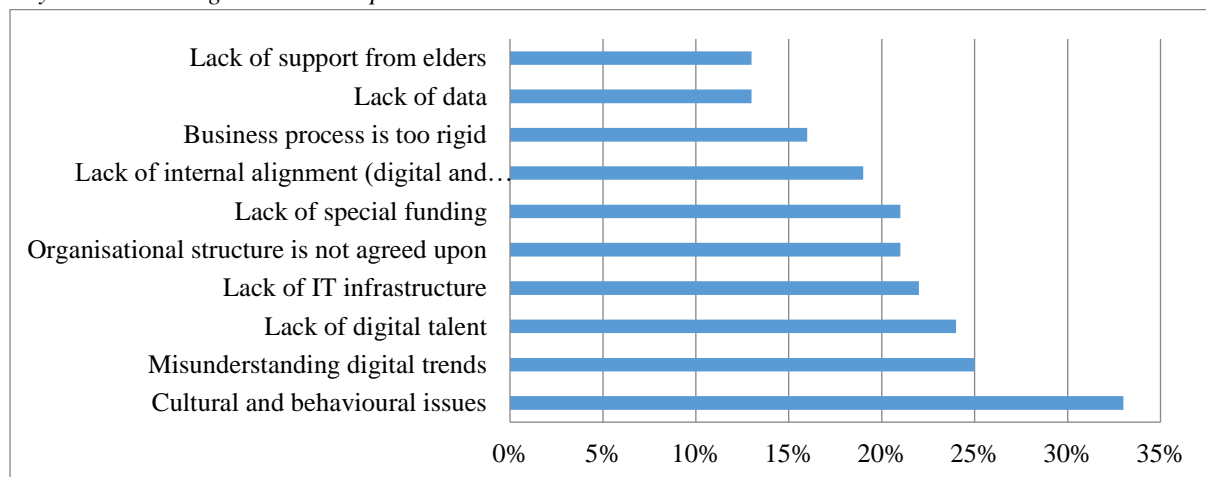
Source: *Goran et al. (2017)*

The main challenge for digital leaders is cultural and behavioural issues (33%), which outweigh technological and organisational aspects, indicating the dominance of the human factor in the digital transformation process. Other significant challenges, such as a lack of understanding of digital trends (25%) and digital talent (24%), also point to stronger education and human resources initiatives. Overall, the study's results emphasise developing critical thinking skills, flexibility and adaptability among managers and staff of modern organisations. The identified relationships between crisis management and digital competences were presented through key leadership competences, which include effective response to crises in the digital environment, a technological approach to management, and the activation of innovative leadership models. In particular, democratisation of management, promoting openness and trust, and personalised employee training are becoming integral elements of modern digital culture (Stern, 2020). In this regard, the consideration of digital leadership skills not only helps to solve problems at the organisational level but also creates the basis for their widespread adoption among the population, forming a platform for achieving sustainable development goals. Thus, an effective combination of developed digital leadership and strategies for mass digital skills training can help overcome crises and ensure society's sustainable development in the digital transformation era.

Discussion

The article's main findings reinforce the existing discussion in the current scientific literature, which covers the issue of digital leadership in achieving sustainable development goals and ensuring organisational resilience. For example, Borah et al. (2022), Hussein et al. (2024) and Moleka (2023) note that the most important element for shaping management strategies is precisely the quality of technological innovation, which is consistent with our data on the need to develop digital leadership competences to achieve progress in implementing the SDGs. Based on our analysis of the academic literature, we found that competences such as managing virtual teams and countering disinformation are key to ensuring the adaptability of organisations in a rapidly changing environment. A study by Promsri (2019) notes that despite modern businesses and organisations needing leaders who understand digital agility

and changing needs for competitive advantage, current digital leadership curricula are insufficient to develop relevant skills, both quantitatively and qualitatively, which is especially true for higher education programmes. Instead, the findings of Cortellazzo et al. (2019) and Orieno et al. (2024) on strategic thinking and innovation as key characteristics of digital leadership correlate with our results, which demonstrate that strategic preparation for crises and change management are important elements of leadership competences. In particular, in the face of growing challenges associated with digital transformation, leaders need to have sufficient technical knowledge, which is also emphasised in the research by Abbatiello et al. (2017). An example of a quantitative study of digital skills is Mialkovska et al. (2024a), who investigate the correlations between managerial functions in education that contribute to the development of organisational level ($r = .53$, $p = .04$), motivation ($r = .41$, $p = .12$) and control ($r = -.42$, $p = .12$) in the acquisition of skills that improve the effectiveness of digital learning. Instead, our study complements the author's work by analysing the dynamics of digital skills of the general population, which allows for a deeper understanding of the effectiveness of digital learning in the context of achieving sustainable development, as it provides a detailed analysis of social changes in digital skills levels (e.g., the projected decrease in the percentage of people with above-average digital skills in information and communication skills from 86.10% in 2021 to 66.73% in 2024), which allows for a better assessment of the effectiveness of training programmes. In this context, the effectiveness of Ukrainian digital learning programmes is low due to the need to overcome the steady downward trend in digital skills. However, as analysed in our work, they are quite competitive in the EU countries. Another study by Hussein et al. (2024) suggests applying a four-factor model that includes digital leadership, sustainable competitive advantage, environmental absorptive capacity, and environmental innovation. The model was evaluated using factor analysis, and the results showed high values of such indicators as the average path coefficient (APC = .43), average R^2 value (ARS = .48), adjusted average R^2 value (AARS = .47), average variance inflation factor (AVIF = 2.08), model fit score (GoF = .56) and other high values, which confirm the correctness of the presented model. In the authors' opinion, these values indicate strong interrelationships between the model components and a high level of model-data fit. In this context, the results of our study confirm the downward trend in the level of digital skills, in particular, information (66.73%), communication (66.72%), problem-solving (50.95%), and content creation (20.56%), which requires significant efforts to improve basic skills. Zervas and Stiakakis (2024) noted that digital skills range from basic computer use to advanced data analysis and innovation. They are key for organisations seeking to achieve economic resilience and meet key sustainable development goals. These skills are the basis of adapting enterprises to technological changes, as they allow them to use the innovative opportunities of the digital economy. Our research on priority digital leadership skills allowed us to establish a connection between specific requirements for leaders in digitalisation, including broader anti-crisis and cultural aspects. Thus, we found that the success of digital leadership mainly depends on flexibility and the ability to adapt to change and manage interpersonal relationships of personnel in virtual and global environments. Studies such as Abbatiello et al. (2017) and Goran et al. (2017) confirm our findings on the crucial role of the cultural environment, behavioural strategies and trust in creating effective digital leadership. Therefore, we emphasise the priority of increasing

efficiency, further promoting innovative activity, and developing digital competences, given their applicability in reducing costs and increasing the overall productivity of organisations.

Conclusion

The results of the study revealed a trend towards a decrease in the level of digital skills among the population, in particular in such important areas as information (up to 75.08% in 2025), communication (up to 75.06% in 2025), and digital content creation skills (up to 23.08% in 2025). Based on this forecast, it is confirmed that digital leadership training is relevant, given the possibility of a sustainable influence of leaders with an appropriate level of significant competences in improving digital skills in society. The development of these skills among leaders also contributes to the development of anti-crisis resilience and social innovations. Based on the current scientific literature analysis, digital competences' high role in increasing anti-crisis resilience and social innovations was revealed, which is also an important factor in implementing the Sustainable Development Goals. Therefore, implementing and improving digital technologies and crisis management practices requires digital leaders to have a high level of strategic thinking, flexibility, and the ability to adapt to rapid change. In addition, a systematic approach to digital learning should be introduced to achieve this level of skills among digital leaders. This approach should be based on integrating theoretical knowledge and practical skills, which, as a result, will create a foundation for the effective management of organisations in times of uncertainty and crisis. It is important to consider the reasons for the projected decline in the level of digital skills, which require the modernisation of educational programmes for training leaders capable of managing crises in the context of developing digitalisation phenomena. The study's results suggest that the success of digital transformation depends on the synergy of two main vectors: digital leadership and the general level of digital skills in society. Thus, the effectiveness of digital leadership training programmes directly affects the ability of leaders to overcome cultural and behavioural problems. The above-mentioned modernisation will allow the development of the most relevant skills in change management and collaboration and, as a result, directly shape the nature of the innovative environment. The urgent need to reorient digital education is highlighted by the current decline in digital competences among the population and organisational staff, which makes digital leadership important in creating a driving force for change.

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