AI Anxiety and Workforce Resilience Through ESG Social Responsibility and Adult Education

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The rapid integration of Artificial Intelligence (abbreviation: AI) is driving a profound industrial transformation, yet it simultaneously generates considerable anxiety among employees, posing risks to sustainable organizational performance. This paper examines AI-related anxiety within the Hungarian labour market and explores mitigation strategies through the lens of the ESG Social pillar. Adopting a mixed-method approach, combining online surveys to assess learning self-efficacy with qualitative interviews, the research investigates the intersection of technological disruption and human capital management. Findings demonstrate that psychological safety and targeted adult education function not merely as HR instruments but as essential governance mechanisms. Moreover, the data highlight that transparent communication regarding AI deployment alleviates uncertainty and fosters a resilient organizational climate conducive to continuous innovation. The paper argues that navigating AI transformation successfully requires a paradigm shift in management. Sustainable governance must prioritize the human dimension by cultivating trust-based environments.

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1 Introduction

Artificial Intelligence (abbreviation: AI) is rapidly transforming the contemporary world, exerting a dual impact on economic and social processes. While the technology promises increased productivity and accelerated innovation, it simultaneously generates uncertainty and anxiety among employees. The aim of this paper is to examine how psychological safety and adult education, key components of the Social ("S") pillar of the ESG framework, can mitigate AI-related anxiety and support successful adaptation. According to the OECD (2023), AI is defined as an adaptive system capable of autonomously deriving inferences from input data. This capability distinguishes AI from traditional automation and enables it not only to replace routine tasks but also to transform processes requiring complex problem-solving (Autor et al., 2003). The Future of Jobs Report 2025 indicates that technological advancement and the green transition will radically reshape skill requirements between 2025 and 2030 (World Economic Forum, 2025). Although macroeconomic evidence, such as analyses by the Yale Budget Lab and the Brookings Institution (2025), suggests relative stability in employment indicators, subjective social perceptions reveal an opposing trend. A survey by the Pew Research Center (2025) shows that 52% of employees report greater concern than optimism, while data from the European Commission (2025) indicate that trust in technology is conditional and closely linked to transparency.

This uncertainty underpins the phenomenon of AI anxiety, which the literature conceptualizes as a multidimensional construct encompassing job replacement anxiety, AI learning anxiety, and ethical concerns. The empirical scale developed by Wang and Wang (2022), the AI Anxiety Scale (AIAS), demonstrates that this form of anxiety is objectively measurable and negatively affects technology acceptance. Empirical evidence further suggests that employees experience heightened anxiety when AI is perceived as a threat, whereas higher levels of learning self-efficacy function as a protective factor (Li et al., 2024). One of the most effective antidotes to technological anxiety can be found in organizational culture, particularly in the presence of psychological safety. According to Edmondson's conceptualization (1999, 2018), psychological safety refers to a shared belief that it is safe to take interpersonal risks, make mistakes, and ask questions within a group. During AI integration, where learning curves are steep and errors constitute a natural part of the process, such an environment becomes critically important. Research by

Martínez-Córcoles et al. (2024) highlights the mediating role of psychological safety: in its absence, employees tend to avoid using new technologies, whereas its presence increases innovative behaviour and reduces resistance to change. In this paper, AI-related anxiety is used as the primary term. It refers to employees' concerns, uncertainty, perceived vulnerability, and perceived threat associated with the introduction and use of artificial intelligence in the workplace. Related expressions such as technological anxiety or fear of AI are treated as overlapping concepts in the literature, but the analysis consistently uses AI-related anxiety as the central concept.

However, the success of technological adaptation is determined not only at the organizational level but also at the individual level, where adult education, through upskilling and reskilling, emerges as a strategic instrument. According to Knowles' andragogical model and the concept of lifelong learning (abbreviation: LLL), adult learning is primarily driven by intrinsic motivation and practical applicability. This issue is closely aligned with the S-pillar of the ESG framework (Nagy-Rádli et al., 2025). In accordance with the EU's Corporate Sustainability Reporting Directive (abbreviation: CSRD) and the Hungarian ESG Act (Act CVIII of 2023), employee training and well-being are no longer merely HR concerns but constitute sustainability obligations. Inclusive training programs reduce digital divides and social inequalities (OECD, 2025) while simultaneously enhancing organizational resilience. Psychological safety and targeted skill development thus jointly form a protective framework capable of transforming AI-related anxiety into constructive adaptation.

The contribution of this paper lies in connecting AI-related anxiety, workforce resilience, ESG social responsibility, psychological safety, and adult education within one empirical framework. While previous research has often examined technological anxiety, workplace learning, or organizational responsibility separately, this paper focuses on how these dimensions interact in the context of AI-driven transformation. The Hungarian labour market context provides additional empirical value, as it shows how employees perceive AI-related risks and learning opportunities in a specific Central and Eastern European setting.

2 Research Objectives and Methodology

The primary objective of the research is to explore the extent to which AI-related anxiety is present among Hungarian employees and to examine how psychological safety and adult education can mitigate this phenomenon. The paper formulates three hypotheses.

- First, it is assumed that a significant proportion of respondents (at least 50%) experience measurable levels of technological anxiety (H1).
- Second, it is hypothesized that higher levels of psychological safety are positively correlated with learning self-efficacy (H2).
- Third, the research investigates the assumption that participation in adult education, whether in the form of upskilling or reskilling, significantly reduces fear and enhances adaptive capacity (H3).

To address these objectives, the paper employs a mixed-methods research design, integrating quantitative and qualitative approaches to achieve both comprehensive coverage and in-depth understanding. Data collection is primarily based on an anonymous online questionnaire using validated measurement scales to assess AI-related fears, perceived workplace psychological safety (e.g., freedom to make mistakes and ask questions), and learning self-efficacy. In the empirical analysis, upskilling and reskilling were treated as a combined adult education category. The purpose of the study was to examine employees' general participation in and perceived need for work-related learning opportunities, rather than to compare different forms of training separately. This is acknowledged as a limitation, since future research could investigate whether upskilling and reskilling have different effects on AI-related anxiety and workforce resilience. As the questionnaire was based on previously validated measurement scales, construct validity was supported by the existing literature. However, the absence of a separate reliability analysis for the present sample is acknowledged as a limitation of the study. Sampling was conducted using convenience and snowball techniques. The target population consisted of Hungarian employees, and the final sample included 239 respondents. Participants were eligible for inclusion if they were employed adults in Hungary and had direct or indirect exposure to digital transformation or AI-related changes in the workplace. The sample was not restricted to one specific industry, as the aim of the

study was to capture broader labour market perceptions rather than sector-specific effects. Therefore, the findings should be interpreted as exploratory and context-sensitive rather than fully representative of the Hungarian labour market.

Quantitative data were analysed using descriptive statistics, correlation analysis, and group comparison tests. To contextualize and deepen the interpretation of numerical findings, the research was supplemented with a qualitative component consisting of up to six semi-structured interviews. These interviews enabled the exploration of individual motivations and psychological mechanisms underlying the statistical patterns. The qualitative interview material was analysed using thematic analysis. The coding process followed a primarily inductive logic, allowing themes to emerge from the interview data, while the interpretation was informed by the study's conceptual focus on AI-related anxiety, psychological safety, ESG social responsibility, and adult education. The entire research process adhered to strict ethical standards, ensuring voluntary participation and full anonymity of all respondents.

3 Results

During the empirical phase of the paper, 239 Hungarian employees of diverse ages and occupational backgrounds participated, providing a comprehensive overview of labour market attitudes toward AI. The combined analysis of quantitative data and qualitative interview insights confirmed that technological transition constitutes not merely a technical challenge but a deeply psychological and sociological issue. The primary finding of the paper is that AI-related anxiety is markedly present in the Hungarian labour market, thereby confirming the first hypothesis (H1). More than half of the respondents (52.7%) reported moderate to high levels of fear. Specifically, 33.9% indicated that they fully feared, while 18.8% reported that they were rather concerned about the possibility that new technologies could threaten their jobs in the future. However, the distribution of anxiety is uneven and follows distinct demographic patterns. Gender-based analysis revealed a notable paradox: while women reported a lower sense of existential threat (23.6%), the proportion was significantly higher among men, reaching 49%. This phenomenon may be explained by the higher concentration of men in technical or industrial sectors where automation and efficiency gains are perceived as direct job-related risks.

A similarly revealing pattern emerged in relation to age, where the data displayed a characteristic U-shaped distribution. Anxiety levels were highest among early-career employees (aged 18–34) and those approaching retirement (aged 55 and above), whereas experienced workers aged 35–54 formed the most stable and least anxious group. This suggests that professional experience and labour market stability function as protective factors, while employees at the beginning and end of their careers perceive themselves as more vulnerable to change. The descriptive results suggest a negative relationship between educational attainment and AI-related anxiety. Respondents with tertiary education largely did not perceive AI as a threat, whereas those with secondary education reported the highest anxiety levels. This finding supports the assumption that workers engaged in routine administrative or manual tasks perceive automation risks more acutely.

The intensity of fear was also closely linked to technological exposure and usage routines. Forty-four percent of respondents reported that some form of AI solution was already in use at their workplace. The data clearly indicate that perceived competence reduces anxiety. The highest levels of fear were observed among employees who possessed partial knowledge but lacked confidence in using AI tools. This group, referred to as "uncertain users", experiences heightened vulnerability due to perceived knowledge gaps. In contrast, active and proficient users reported significantly lower anxiety levels, reinforcing the conclusion that technological literacy itself has an anxiety-reducing effect. However, the success of technological adaptation depends not only on individual competencies but also on organizational culture. The second hypothesis (H2) focused on the role of psychological safety. While three-quarters of respondents (75%) generally perceived their workplace as safe in terms of asking questions and making mistakes, one quarter did not experience such a supportive environment. Particularly concerning is the finding that 33% of respondents did not perceive managerial support for experimentation, and nearly 24% reported that they were reluctant to seek help when facing technological difficulties. Statistical analysis revealed that the absence of psychological safety inhibits innovation-related adaptation: employees who do not feel safe are more likely to perceive AI implementation as a threat and are less open to acquiring new skills.

The most encouraging findings emerged in relation to the third hypothesis (H3), which examined the role of adult education. Results indicate that Hungarian employees exhibit a high willingness to learn. Seventy-nine percent of respondents agreed that well-structured training programs would reduce their fears, while 82% believed that training focused on practical application would alleviate feelings of vulnerability. Analysis of training motivation revealed unexpected demographic patterns. On a five-point scale, respondents with primary education demonstrated the highest learning motivation (mean = 4.50), suggesting that the most vulnerable group perceives learning as the primary means of labour market survival and upward mobility. Equally noteworthy is the attitude of employees aged over 55, whose learning motivation (mean = 3.70) was only slightly lower than that of middle-aged respondents and exceeded that of the youngest cohort. This finding challenges the stereotype that older workers resist new technologies. For this group, training represents a means of maintaining professional relevance. These statistical findings were further enriched by the qualitative interviews conducted during the second phase of the research. The interviews confirmed that AI-related anxiety is not a homogeneous phenomenon but is strongly shaped by professional identity and life circumstances. Digitally mature younger employees, such as Milan, one of the interviewees, approached AI pragmatically, viewing it as a functional work tool without anxiety. In contrast, professionals in human-centred fields, such as Erika (a teacher) and Júlia (a healthcare administrator), expressed concerns not about the technology itself but about dehumanization and the blurring of responsibility. In their cases, anxiety was primarily ethical in nature, centred on the question of how the human element can be preserved in care-oriented professions. A third type of anxiety was illustrated by Zoltán, a middle manager, whose concerns stemmed from performance pressure and time constraints. One of the most important insights from the interviews is that employees are generally willing to engage in learning, but the lack of organizational support and dedicated learning time often constitutes a significant barrier. As Júlia noted, "*Knowledge is always reassuring, especially when people's health is at stake*" highlighting that relevant and well-designed training not only enhances competence but also fosters psychological safety.

The findings demonstrate that while AI-related anxiety is a real and widespread phenomenon in the Hungarian labour market, it does not constitute an insurmountable obstacle. High learning motivation and a strong demand for psychological safety clearly identify the key intervention points. The success of

technological transition depends not on algorithms alone but on human-centred leadership and targeted, supportive adult education programs.

4 Discussion and Recommendations

Based on the synthesis of quantitative survey data and in-depth interviews, the research identified three core problem areas that directly correspond to the study's hypotheses: the nature of AI-related anxiety (H1), the lack of psychological safety (H2), and the inadequacy of current adult education practices (H3). Addressing these challenges extends beyond the scope of human resource management and constitutes a strategic issue within the Social ("S") pillar of the ESG framework.

The primary problem is that AI-related anxiety, affecting more than half of employees (52%), does not stem solely from a lack of technological knowledge but rather from deeper uncertainties related to professional identity and responsibility. As highlighted in the interviews, such as those with Erika, a teacher, and Júlia, a healthcare administrator, fear is often not focused on job loss per se but on the erosion of professional roles and the loss of control over decision-making processes. In contrast, technologically mature employees exhibited minimal anxiety, largely due to clearly defined professional boundaries and responsibilities. Consequently, the key intervention lies in transparent organizational communication. During AI implementation, it is insufficient to focus solely on the "how"; organizations must also explicitly address the "why" and clarify issues of accountability and responsibility. Demystifying technology and clearly delineating human decision-making authority can significantly reduce perceptions of existential threat.

The second critical issue concerns the strong correlation between psychological safety and learning self-efficacy. The research confirms that access to technology alone is insufficient if organizational culture does not support experimentation, error-making, and inquiry. Insecure employees, such as Réka or Zoltán, a middle manager, often refrain from learning because they fear that asking questions signals incompetence. This latent anxiety inhibits innovation-related adaptation. The recommended intervention is the deliberate cultivation of psychological safety through the creation of learning-oriented environments (internal workshops or "failure-sharing" events), where mistakes are framed as integral components of the learning process rather than as punishable shortcomings. Leadership plays a decisive

role in this regard: managers are uniquely positioned to establish the trust-based climate in which technological change is perceived not as a threat but as a shared developmental journey.

Finally, current adult education practices frequently fail to align with employee needs. Although learning motivation is high (71%), it becomes activated only when training is relevant, context-specific, and practice-oriented. Instead of standardized, generic AI education programs, organizations require targeted, role-specific training initiatives, for example, data security training for administrative staff or AI-supported pedagogical methodologies for educators. Importantly, training programs should not focus exclusively on technical competencies but should also support the redefinition of professional identity within increasingly automated work environments.

From a systemic perspective, these challenges necessitate the alignment of institutional, policy, and societal responsibilities. Beyond fulfilling ESG reporting obligations under the CSRD, companies must elevate employee well-being and education into core strategic priorities. At the policy level, inclusive digital upskilling initiatives should be actively promoted, particularly for technologically vulnerable groups such as older workers and individuals with lower levels of formal education. Only through such coordinated efforts can AI integration avoid exacerbating social inequalities and instead, through psychological safety and knowledge empowerment, contribute to a more sustainable and human-centred labour market.

Based on the findings, a three-step human-centred AI transition framework can be proposed. First, organizations should reduce uncertainty through transparent communication about the purpose, scope, and responsibility structures of AI use. Second, they should strengthen psychological safety by encouraging questions, experimentation, and open discussion of mistakes. Third, they should provide targeted adult education that is role-specific, practice-oriented, and accessible to vulnerable employee groups. Together, these measures connect AI implementation with the Social pillar of ESG by protecting employee well-being, employability, and organizational resilience.

5 Conclusions

The findings of this study demonstrate that AI integration represents not merely a technological adaptation challenge but a fundamental issue of human strategy and sustainability, directly linked to organizational social responsibility within the ESG framework. The empirical results corroborate trends identified in the international literature while also refining them within the Hungarian context. The identification of anxiety among more than half of respondents supports Wang and Wang's (2022) conceptualization of AI anxiety as a multidimensional construct, encompassing not only job replacement anxiety but also learning-related anxiety. Particularly instructive is the strong negative correlation between educational attainment and anxiety levels, which reinforces the OECD's (2023) warning regarding the risk of widening digital divides. The data suggest that technological transition disproportionately affects the most vulnerable groups, those with lower educational attainment or limited technological maturity, thereby underscoring the urgency of systemic social intervention.

One of the most significant insights of the study concerns the decisive role of organizational culture. The findings reaffirm Edmondson's (1999, 2018) model of psychological safety by demonstrating that environments lacking support for error-making and open inquiry inhibit innovation-related adaptation. Employees who perceive their workplaces as unsafe tend to disengage from learning as a defensive mechanism, creating a self-reinforcing cycle that intensifies anxiety. Conversely, supportive leadership behaviour and transparent communication not only facilitate technology acceptance but also reinforce employees' professional identities amid continuous change. The strategic transformation of adult education emerges as a key solution. The research highlights that employees' willingness to learn is substantial, provided that training is relevant and practice-oriented, in line with Knowles' andragogical principles. However, technological training alone is insufficient. Effective development programs must integrate upskilling and reskilling with the deliberate cultivation of psychological safety. This integrated approach situates the issue squarely within the S- pillar of the ESG framework, as preserving employees' mental well-being and employability has become an essential prerequisite for corporate sustainability. In conclusion, the era of artificial intelligence does not signify the end of human work but rather its transformation. The successful integration of AI depends not on the sophistication of algorithms but on the support

of the human dimension. Organizations that recognize knowledge and trust as the primary antidotes to AI-related anxiety, and that succeed in creating workplace ecosystems where technology augments rather than replaces human capabilities, will be best positioned to achieve sustainable competitiveness and shared development.

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