Am I fit?

Improve your AI skills!

AI Literacy in Working Context – Needs and Challenges

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1. Executive Summary

This report centers on the identification and analysis of Artificial Intelligence (AI)-related skill requirements for employees without IT/technical background in Small and Medium-sized Enterprises (SMEs). Emphasizing results over process, the report combines theoretical modelling and empirical validation to generate actionable insights for vocational education and training (VET) in the context of AI adoption.

A **cross-country review** revealed a growing awareness of AI's relevance but also highlighted significant disparities in AI-Literacy across Belgium, Germany, Italy, Poland, and Portugal.

Despite diverse national strategies and initiatives, common challenges emerged: a lack of foundational AI knowledge, minimal structured training for non-technical staff, ethical concerns (e.g. bias, data protection), and organizational inertia.

In **expert interviews** with SME managers across all five countries consistent skill gaps among non-technical employees were reported: lack of basic AI understanding, low data literacy, and insufficient capability to use AI tools such as ChatGPT or AI-based CRMs. Ethical awareness and critical thinking were also markedly underdeveloped.

Companies emphasized the need for practical, role-specific competencies rather than technical expertise and called for scalable, modular training formats.

The **survey** conducted among **employees** from partner countries revealed that all respondents are using AI tools at work. Over 40% had no prior formal or informal training. Employees expressed strong intrinsic motivation for learning, driven by curiosity and perceived career relevance. Only half felt confident using AI tools, and less than 20% reported understanding core AI principles such as machine learning, bias, and transparency.

Major barriers included lack of time, inadequate training offerings, and perceived topic complexity—especially among those with little existing knowledge.

Participants of **focus groups** (AI Experts & Practitioners) confirmed the theoretical skill dimensions and stressed the importance of a psychologically safe learning environment, organizational encouragement, and context-sensitive training methods.

These results underline a strong and unmet demand for structured, accessible, and context-specific AI training in SMEs. The combination of low confidence, fragmented knowledge, and high motivation indicates significant potential for targeted intervention. Furthermore, employees' ethical concerns and uncertainty about AI's role underscore the need to integrate critical reflection and communication skills into training.

2. Introduction

This report presents an in-depths exploration of the essential needs and requirements for AI skills in vocational education and training within business environments.

The report integrates both theoretical and empirical perspectives and is organized around following components.

- **Theoretical analysis** compiles an international literature review, identifying appropriate AI-Literacy models and concept as well as country-specific review of current strategies, initiatives and challenges.
- **Empirical part** comprises interviews with representatives of SME, a survey with employees and focus groups with relevant stakeholders from business and education sector in all partner countries to identify currents state of AI literacy in SME, the needs, and challenges.

This report describes the procedure used and outlines the results of this multi-stage process. It begins by defining **AI literacy** and presenting "AI country profiles" of the partner countries. Each country profile provides a summarized overview of national current studies, initiatives, challenges and needs, AI concepts and dimensions as well as trends and developments. Building on these insights, an empirical study was carried out with representatives of the target groups. This study phase provided valuable data and perspectives that revealed the specific needs, gaps, and expectations of employees and managers regarding AI-related competences in the workplace.

The findings from the different phases of analysis will be synthesized to derive an expanded, holistic model of **AI literacy**. This model will form the foundation for both the **AI Literacy Skill Framework** and the **AI Skill Scanner** and will guide the next steps of the project.

3. AI Literacy: Overview of Country-Specific Perspectives

Artificial intelligence (AI) is transforming workplaces, societies, and daily life, creating new demands for knowledge and skills. As AI technologies become increasingly relevant, the ability to understand, use, and critically reflect on AI emerges as a crucial competence for both individuals and organizations.

A shared understanding of AI literacy forms the theoretical foundation of the "Am I Fit?" project. Developing this common basis required careful consideration of several key aspects:

- the national characteristics of AI development in each partner country,
- the inherent complexity of AI literacy through a multidimensional approach,
- the need for a framework that combines theoretical concepts with practical relevance for professional contexts.

To achieve this, desk research on current national studies and initiatives related to AI literacy was conducted. These sources were analysed with respect to identified challenges, needs, and requirements, the various dimensions of AI literacy, as well as emerging trends and developments.

The following picture illustrates the main elements of this phase.

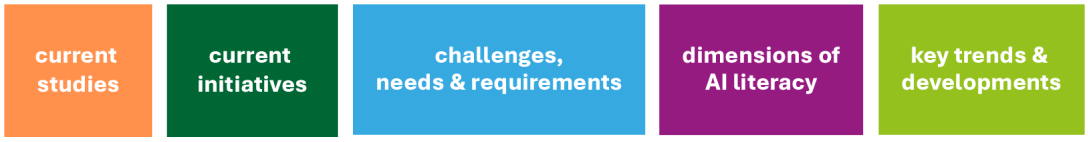


Figure 1: Elements of literature study

The next section a short overview of AI literacy concepts and frameworks (section 3.1) is presented. This is followed by a detailed overview of the current status of AI literacy in each partner country (section 3.2) and the conclusion of the finding (section 3.3).

3.1. AI Literacy – short overview of existing concepts

In recent years, AI literacy has emerged as a critical field of study and a foundational skill set essential for navigating modern society. AI literacy encompasses far more than the technical ability to operate AI systems. It involves a nuanced understanding of how AI shapes daily life, the capacity to critically assess its limitations and associated risks, and a considered engagement with its ethical and societal implications. Increasingly, it is recognized as an essential competence for employability in a labour market where artificial intelligence is becoming pervasive across sectors (Biagini, 2024; Li & Kim, 2024; Ng et al., 2021).

Despite its growing importance, no single universally accepted definition exists. Nonetheless, most frameworks converge on viewing AI literacy as a multilayered concept—integrating knowledge, skills, ethics, and attitudes.

A notable definition comes from Long and Magerko (2020, p. 2), who describe AI literacy as "*a set of competencies that enables individuals to critically evaluate AI technologies, communicate and collaborate effectively with AI, and use AI as a tool online, at home, and in the workplace*." Their framework outlines 17 competencies, ranging from recognizing AI in daily life to addressing ethical challenges.

Ng et al. (2021), drawing on Bloom's taxonomy, conceptualise AI literacy across four dimensions: *(1) AI knowledge and understanding, (2) use and application, (3) critical 3 evaluation and creation of AI, and (4) AI ethics*, laying the foundation for its implementation in educational contexts.

Faruqe et al. (2021), building on Long and Magerko's framework, propose a multi-level competence model using four behavioural anchors - Consumer, Co-worker, Collaborator, Creator - to support competence-based assessment. These behavioural anchors are intended to help researchers and educators identify and assess individuals' AI skill levels, making AI literacy a practical tool for curriculum development, professional training, and recruitment.

Wienrich et al. (2022) emphasize *a human-centred perspective, expanding AI literacy to include mental models, behavioural intentions, and reflective capacities*. This framework reinforces that effective AI literacy extends to psychological and motivational dimensions.

Assessment frameworks have also evolved. Wang et al. (2022) propose a 12-item scale structured around awareness, use, evaluation, and ethics. Biagini (2024) underscores the value of self-assessment tools, enabling learners to identify personal gaps and drive their own development.

The World Economic Forum's (2025) AI Literacy Framework (AI Lit) further strengthens this conceptual foundation. Developed in collaboration with the European Commission and OECD, it defines AI literacy across four domains:

- Engaging with AI,
- Creating with AI,
- Managing AI's actions,
- Designing AI solutions (WEF, 2025).

This framework highlights not only the practical and ethical dimensions of AI use, but also the strategic and organizational capacities required to manage AI responsibly in education, workplaces, and society at large.

Alongside academic and institutional frameworks, regulatory developments in Europe are now shaping the future of AI literacy. The **EU Artificial Intelligence Act** (European Commission, 2025) entered into force on 1 August 2024 and will become fully applicable on 2 August 2026. It establishes the first comprehensive regulatory framework for AI, classifying AI systems by risk levels and setting clear requirements for safety, transparency, accountability, and human oversight. The Act creates significant pressure for action not only at the political and governmental level, but also within companies and organizations, as it requires professionalized, compliant, and ethically responsible AI practices.

Importantly, the AI Act does not exist in a vacuum; its implementation is closely tied to the specific developmental stages, regulatory priorities, and national strategies of EU member states. This interconnection underscores that AI literacy is both a European and national challenge, where individual competencies must be supported by organizational readiness and coherent governance structures.

These theoretical, institutional, and regulatory perspectives reveal that AI literacy should be understood as a competence-based, multidimensional concept. It is not merely a technical skill, but a societal competence requiring critical reflection, ethical responsibility, and the ability to collaborate with AI across diverse contexts. The convergence of educational frameworks, self-assessment tools, and regulatory obligations such as the AI Act highlights a clear trajectory: **AI literacy is becoming a core prerequisite for employability, democratic participation, and organizational competitiveness in the age of artificial intelligence.**

3.2. AI Literacy in Partner Countries

To gain a nuanced understanding of the state of AI literacy across the project partner countries—Belgium, Germany, Italy, Poland, and Portugal—national studies and initiatives were systematically analysed. The analysis focused on current challenges, needs, and requirements for AI literacy, the dimensions of AI literacy addressed, and key trends and developments in both scientific research and business practice. This cross-national review (status of analysis: 2024) provides the foundation for identifying similarities, differences, and opportunities for harmonizing AI literacy framework across partner countries.

3.2.1. AI Literacy in Belgium

Research that explicitly addresses AI literacy in Belgium is limited. Most available publications focus on related concepts such as digital literacy or data literacy. For example, Noordt & Crompvoets (2022) discuss digital transformation in public administrations, Audenhove (2023) explores broader issues of digital inclusion, and Latinne & Deprez (2024) investigate data literacy in educational contexts.

This is notable given the number of AI initiatives in Belgium. For example, the "DigitalWallonia4.ai" program (https://www.digitalwallonia.be), launched in July 2019 by the Minister of Digital Affairs, Pierre-Yves Jeholet, aims to accelerate AI adoption in Wallonia and develop the regional AI ecosystem. The program combines awareness-raising, training initiatives, and concrete support for companies seeking to integrate AI into their operations, including prototype development.

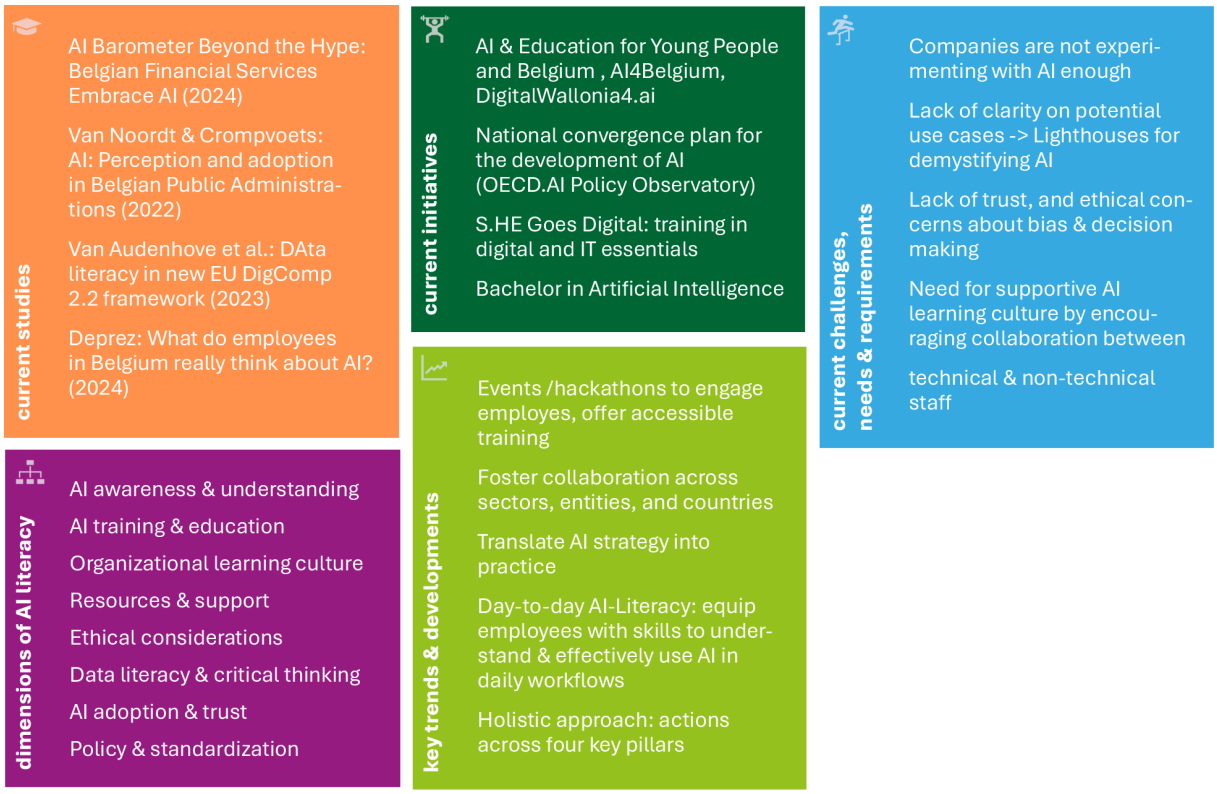


Figure 2: AI Literacy in Belgium

A key challenge in Belgium is that companies often do not experiment sufficiently with AI. There is a recognized need for AI "lighthouses" to demystify the technology and foster collaborative opportunities. Initiatives such as "AI4Belgium" (https://bosa.belgium.be), a coalition of public services, private sector actors,

academia, and civil society, aim to encourage collaboration, technology sharing, and access to financing.

In addition, Belgium has invested in **education and public awareness initiatives** that explicitly link AI to future skills. Events like "AI & Education for Young People in Belgium" (FARI Brussels) increase visibility and engagement with AI initiatives, while degree programs such as the Bachelor in Artificial Intelligence provide practical implementation pathways.

3.2.2. AI Literacy in Germany

In In Germany, recent studies on AI literacy (Wienrich, Carolus, & Markus, 2022; Lauchpichler, Aster, Schirch, & Raupach, 2022; Cousseran, Lauber, & Hermann, 2023) indicate that large segments of the population have only a limited understanding of AI. Knowledge and experience gaps are particularly pronounced across generations. One contributing factor is that simple user interfaces allow AI tools to be used without a full understanding of their functioning. When it comes to teaching AI literacy, even educators often lack clarity on the content and structure that can be effectively taught. Research emphasizes a human-centered approach that considers not only technology, design, and development but also the users themselves. Accordingly, it is important to consider a "micro level" perspective, addressing individual factors of AI literacy—such as cognitive readiness—within organizational and social contexts.

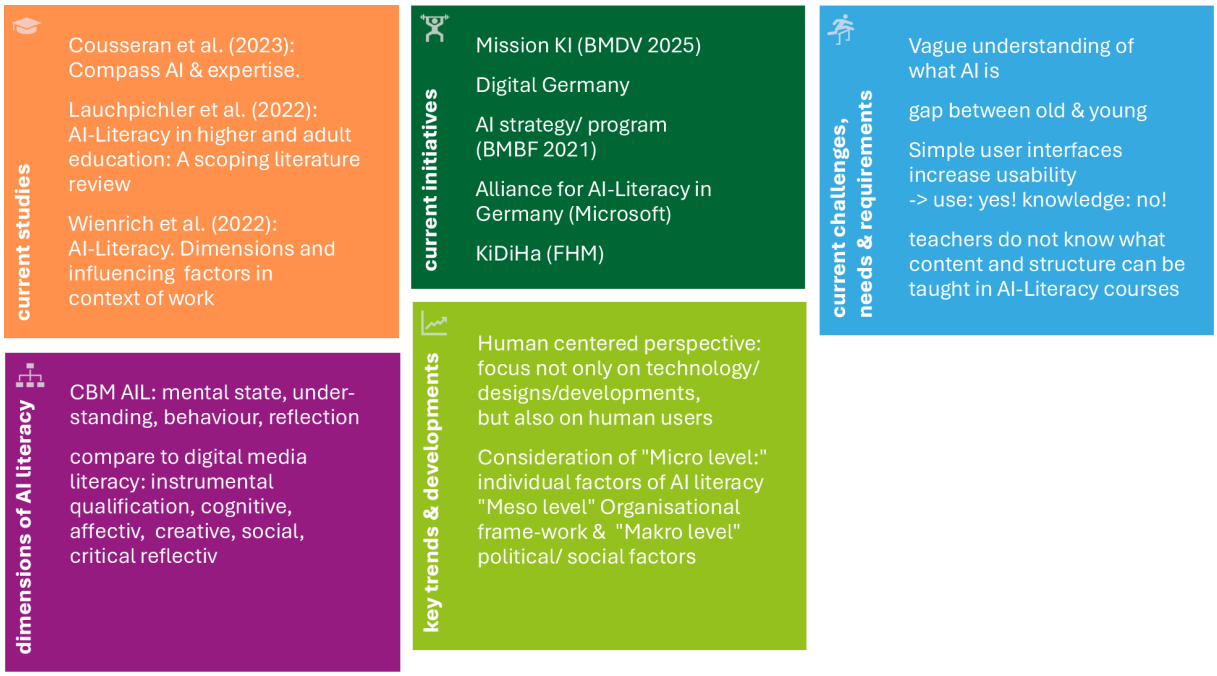


Figure 3: AI Literacy in Germany

There are many initiatives that aim to provide AI skills. In addition to broad initiatives that address AI Literacy as a challenge for society as a whole (e.g. the Alliance for AI-Literacy in Germany, https://aiskillsnavigator.microsoft.com/de-de), there are more specific approaches that target specific populations or sectors (e.g. artificial intelligence in the skilled trades, https://www.ki-di-ha.de/).

3.2.3. AI Literacy in Italy

In Italy, recent academic contributions such as *Introduction to AI* (Riguzzi, 2006), *Knowledge of AI* (Mizzaro, n.d.), and *Training for Teachers and Learning Paths in AI* (Piccione, 2021) provide a foundation for understanding the current landscape of AI-Literacy. These studies focus on both conceptual understanding and practical training pathways, particularly for educators and learners, highlighting the growing importance of structured approaches to AI education.

The national agenda is guided by the *Italian Strategy for Artificial Intelligence 2024–2026*, coordinated by AGID. This strategy aims to stimulate the integration of AI into public administration and business innovation, foster talent development through high-quality training systems, and reinforce Italy's positioning within international AI research networks.

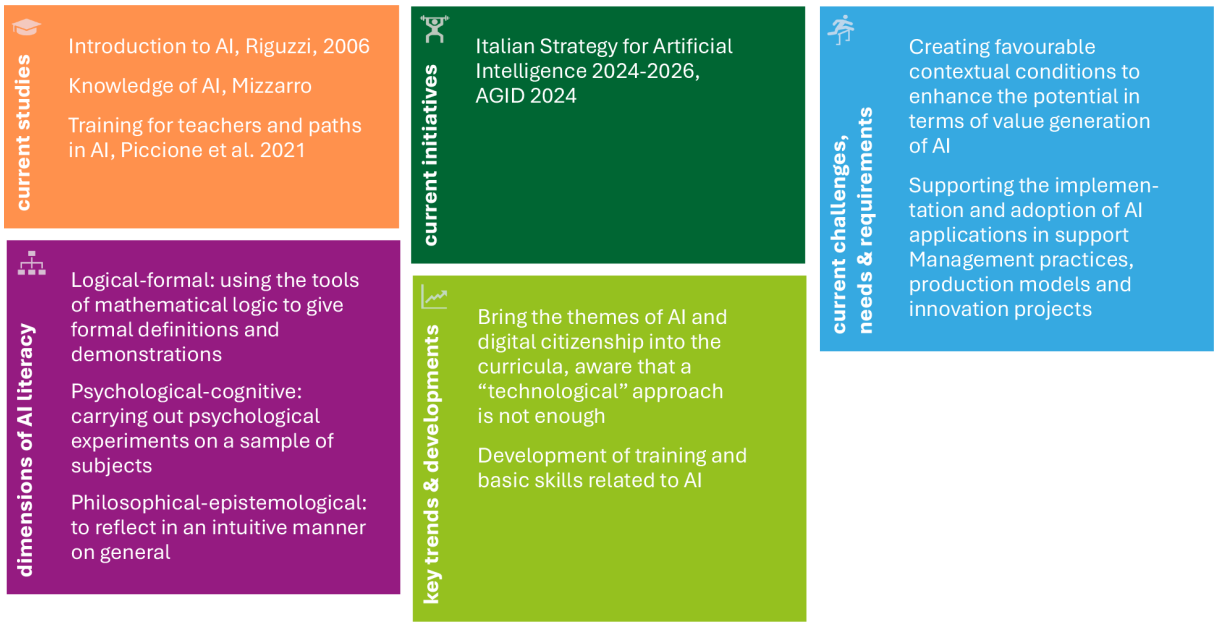


Figure 4: AI Literacy in Italy

Among the most pressing challenges are the need to enhance the adoption of AI across sectors, develop favorable conditions for value creation through AI, and align educational systems with the demands of emerging technologies. There is a strong

emphasis on facilitating innovation in management practices and streamlining public services through AI-based solutions. Furthermore, connecting national research units with major global development platforms remains a priority.

Italy's approach to AI-Literacy includes multiple dimensions: a logical-formal perspective grounded in mathematical logic; a psychological-cognitive dimension based on empirical study of human understanding; and a philosophical-epistemological approach that emphasizes intuitive and reflective inquiry. The latter is considered particularly suitable in the early phases of learning about AI.

Key trends indicate that Italy is committed to increasing investment in both foundational and applied AI research. A particular focus lies in the development of trustworthy and anthropocentric AI systems, consistent with European values. The integration of AI and digital citizenship into formal education curricula is also gaining traction, recognizing that technical knowledge alone is insufficient. Instead, a broader understanding that includes social, ethical, and civic dimensions of AI is being promoted.

3.2.4. AI Literacy in Poland

The "Policy for the development of AI in Poland" (https://wp.oecd.ai/app/uploads/2021/12/Poland_Policy_for_Artificial_Intelligence_Development_in_Poland_from_2020_2020.pdf) establishes Poland's strategic direction for AI, aiming to integrate AI technologies into education, research, and the economy. It highlights the need to build a robust AI ecosystem while ensuring ethical and societal considerations. A cornerstone for this ecosystem is the "AI Lab" at the National Information Processing Institute (https://opi.org.pl/en/). It conducts cutting-edge research in natural language processing and computer vision, addressing both academic and industrial challenges.

The scientific basis for these exemplary initiatives is formed by findings from studies such as "The State of Polish AI 2021" (Fundacja Digital Poland, 2021), a report that provides a comprehensive analysis of the AI ecosystem in Poland, showcasing the country's advancements in AI research, development, and applications. It highlights Poland's ranking in Europe, its strengths in AI implementation, and challenges faced by companies and experts in the field like the limited awareness and understanding of AI among business leaders and SMEs. It identifies a need for deeper integration of AI into business operations and more robust training programs.

Also, the EY study "AI and the Job Market in Poland" (EY Polska, 2023)identifies a significant need for education about AI to understand its impact on the job market and prepare workers for the upcoming changes.

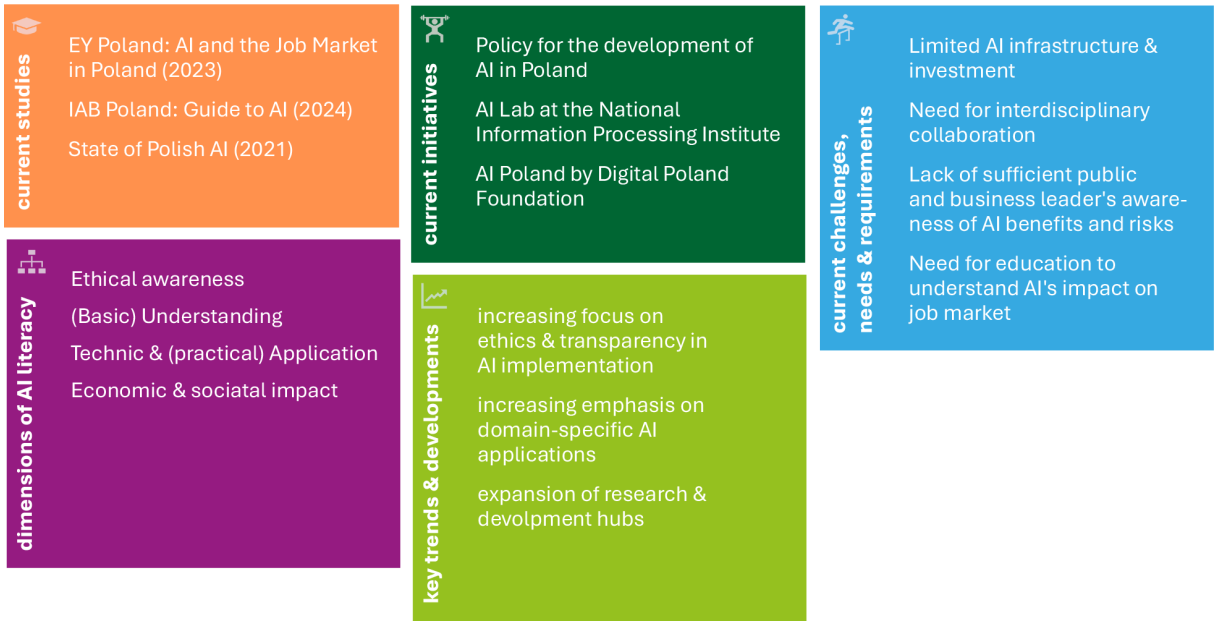


Figure 5: AI Literacy in Poland

3.2.5. AI Literacy in Portugal

As early as 2018 in Portugal Veiga et al. (Veiga, Pires, & Paulo, 2018) explored how AI technologies, including machine learning and cognitive computing, will significantly affect work processes, job structures, and economic dynamics. The study highlights employees' uncertainties about AI's impact but also emphasizes its potential benefits, such as reducing workplace accidents. It advocates preventive measures to prepare organizations for AI's revolutionary effects, aiming to balance technological progress with worker wellbeing and safety (see also (Francisco, 2019).

These needs are met by various Portuguese projects such as “Bridge AI” (https://bridge-ai.eu/wp/en), an initiative funded by the Foundation for Science and Technology (FCT) and PlanAPP, through the General Secretariat of the Presidency of the Council of Ministers of Portugal. The initiative aims at promoting the adoption and scaling of trustworthy Artificial Intelligence (AI) within small and medium-sized enterprises (SMEs) across various sectors. The project focuses on fostering innovation, increasing competitiveness, and ensuring responsible use of AI technologies. An example of a practical initiative is “Impulso AI” (https://www.apdc.pt/iniciativas/impulso-ia/): a program developed by Portuguese Association for the Development of Communications in partnership with Google, aiming to enhance AI-Literacy among professionals across various sectors. It offers free, accessible courses covering AI topics such as machine learning, data-driven decision-making, and cloud computing.

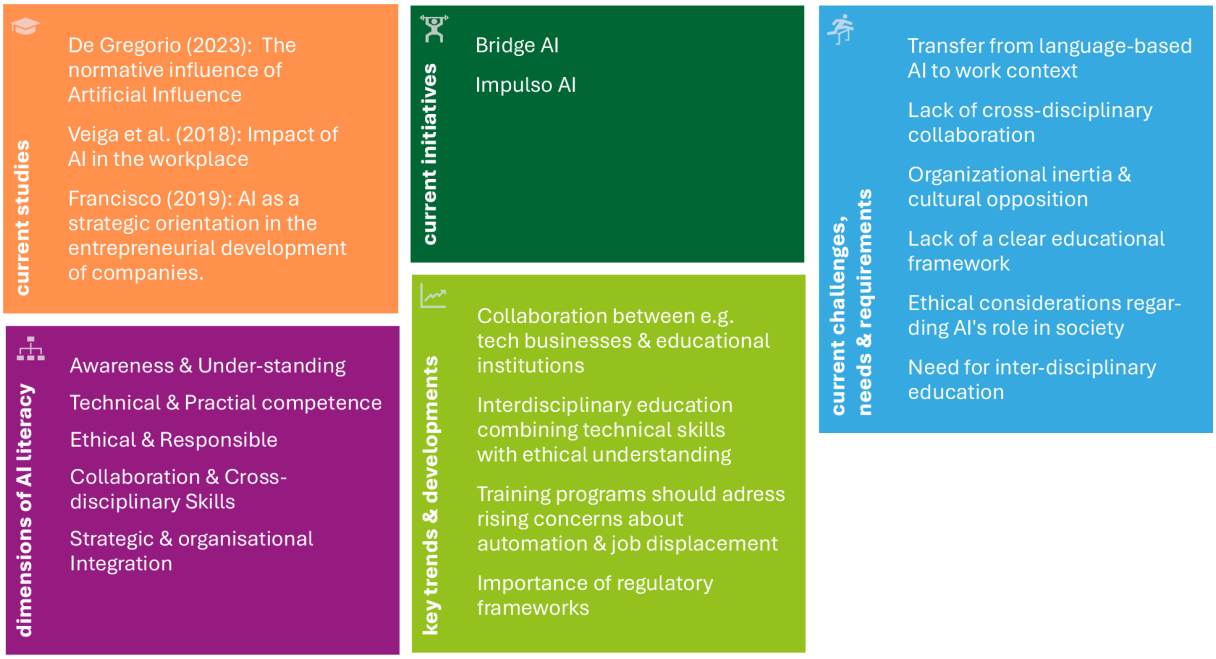


Figure 6: AI Literacy in Portugal

De Gregorio (De Gregorio, 2023) takes an overarching political and social view on AI in his study on the normative influence of AI. He explores how AI systems, particularly generative models and algorithmic processes, shape and influence societal norms. It emphasizes the normative power of AI in areas like decision-making and governance. The study examines AI's role in democracy, ethics, and fundamental rights, addressing the regulatory and legal frameworks necessary to govern AI technologies responsibly and ethically. The paper highlights challenges related to AI-Literacy, such as cultural resistance to new technologies, the lack of a clear educational framework, and ethical considerations regarding AI's role in society. It also underscores the need for interdisciplinary education to improve AI understanding across various sectors and organizational readiness to adapt to AI-driven changes.

3.3. Summary of findings and conclusions

Across the five partner countries, AI literacy emerges as a multifaceted challenge that intertwines policy ambitions, educational initiatives, workforce readiness, and societal engagement.

AI literacy research in **Belgium** often focusing combine areas like digital or data literacy. Despite this, national initiatives such as DigitalWallonia4.ai and AI4Belgium actively promote AI adoption through training, awareness, and collaboration. Challenges

include limited AI experimentation in companies and a need for more demonstrative AI projects.

In **Germany**, studies show significant deficits in AI understanding across age groups, with even educators lacking clear pedagogical frameworks. National initiatives like the Alliance for AI Literacy aim to address societal and sector-specific challenges. Emphasis is placed on user-centered approaches that integrate psychological and contextual factors into AI literacy efforts.

Italy promotes AI literacy through academic, institutional, and philosophical frameworks, emphasizing logical, cognitive, and ethical dimensions. The national AI strategy (2024–2026) focuses on integrating AI into public administration, education, and international collaboration. Challenges include slow AI adoption, the need for innovation infrastructure, and bridging educational gaps.

Poland's AI literacy strategy is shaped by its national AI policy and research institutions like the AI Lab, which support applied research. Studies highlight gaps in AI awareness, particularly among SMEs and business leaders, and call for stronger training and integration in business contexts. Emphasis is on ecosystem development and preparing the workforce for AI-driven changes.

In Portugal, early studies and initiatives stress both the transformative potential and societal implications of AI. Programs like Bridge AI and Impulso AI focus on responsible AI adoption in SMEs and improving professional AI literacy. Key issues include ethical concerns, regulatory preparedness, and the need for interdisciplinary educational frameworks.

Country	Gaps and Challenges	Key Priorities
Belgium	Limited academic focus on AI literacy; insufficient AI experimentation in businesses; need for public "lighthouses"	Promote AI awareness and practical application through programs; expand education linking AI to future skills
Germany	Widespread lack of understanding, especially intergenerational; unclear teaching methods; superficial AI use	Foster human-centered AI literacy; support educators; tailor approaches to users' cognitive and contextual needs
Italy	Low AI adoption in sectors; education not aligned with emerging tech needs; fragmentation between theory and practice	Enhance national training systems; connect research with application; promote trustworthy, human-centered AI

Poland	Low AI awareness among SMEs; limited training; weak business integration; readiness gap in workforce	Build AI-capable ecosystem; deepen integration in business; offer targeted workforce training and upskilling
Portugal	Cultural resistance; unclear educational models; ethical and normative concerns regarding AI deployment	Implement interdisciplinary AI education; support SME adoption; ensure regulatory and ethical governance of AI

Figure 7 Country findings – gaps and priorities

In conclusion, AI literacy represents a shared challenge across all partner countries. While national contexts and levels of development vary, there is a clear need to integrate AI literacy into educational programs, link policy and research with workplace practices, and ensure inclusive access. Educators frequently lack the frameworks and resources to teach AI effectively, while businesses—particularly SMEs—face challenges in practical AI adoption and workforce readiness. Despite differences in emphasis, there is a common demand for applied, accessible, and context-sensitive AI literacy strategies that support both learning and working environments. Strengthening AI literacy across these areas will be essential to unfold AI's innovation potential while promoting societal trust, participation, and engagement in the AI-driven economy.

4. Empirical study

Methodological design

A mixed method approach is used to validate the theoretical and country-specific findings in qualitative and quantitative terms.

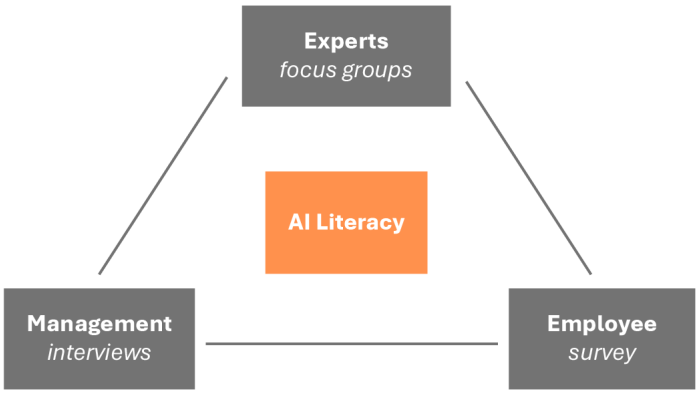


Figure 8: Target groups of empirical survey

To address the complexity of the task of developing the AI skills of non-technical employees in company training, the topic is examined from three perspectives: qualitative expert interviews with management representatives of SMEs, a survey of employees and focus groups of experts in the respective countries.

This approach should lead to concrete findings regarding individual qualification needs (micro level) and organizational adaptation needs (meso level).

4.1. Qualitative expert interview with representatives of SME

Methodological setting of interviews

The **aim** of qualitative interviews with representatives of SME is to identify essential AI-related skills, assess their alignment with business needs, and understand the key barriers to AI adoption from the perspective of company management.

The **sample** consisted of six representatives of SMEs per project partner (Germany, Poland, Italy, Portugal and Belgium) were interviewed in qualitative guided interviews. People were specifically selected for the sample who have expert status due to their experience in company training and further education, HR management, AI and/or IT. The interviewees represented a diverse mix of industries and professional roles, reflecting the wide applicability of AI across sectors. Participants included company

owners, managers, marketing professionals, legal advisors, IT consultants, and public sector stakeholders. Their organizations spanned various fields such as manufacturing, tourism, marketing, education, food distribution, law, and information security. This variety provided rich insights into AI integration needs and challenges across both tech-driven and traditionally non-technical environments.

To conduct the interview a guide was developed. Discussed and thematized were following topics:

- Introduction and integration of AI in the own company
- AI competence requirements for non-technical employees and non-IT experts (e.g. psychological or engineering understanding)
- Need for action for the company in the areas of application, implementation, (further) development, communication and explanation,
- Hurdles and challenges for the introduction of AI
- Status quo training and development programs
- AI governance

The interviews were recorded, transcribed and analysed using qualitative content analysis. The findings below summarize common themes and notable insights shared by the participants.

4.1.1. Results

AI-Related Skills Gaps

Across all countries, there is a clear demand for basic AI-Literacy among non-technical staff. This includes the following aspects:

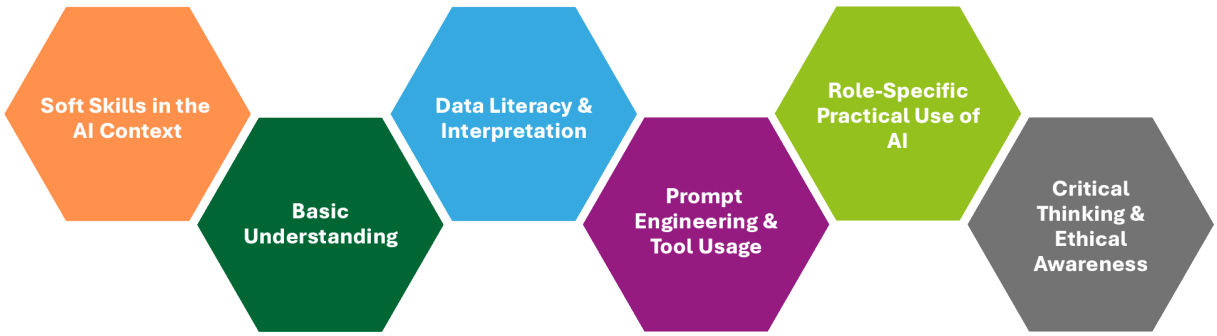


Figure 9: Quotations from interviews regarding skill gaps

Soft Skills in the AI Context: Skills such as adaptability, creativity, and collaborative problem-solving were repeatedly cited as necessary complements to AI-Literacy (Poland, Interview 3; Belgium, Interview 2).

Basic AI Understanding: Most interviewees noted that employees lack a fundamental grasp of how AI systems function, their potential, and limitations (e.g. Germany, Interview 1; Portugal, Interview 2).

Data Literacy & Interpretation: The ability to interpret data outputs generated by AI systems is deficient in several organizations (Italy, Interview 4; Portugal, Interview 6).

Prompt Engineering & Tool Usage: Many SMEs observed a lack of ability to effectively interact with AI tools like ChatGPT or AI-driven CRMs (Belgium, Interview 3; Poland, Interview 1).

Interviewees consistently indicated that deep technical expertise (e.g., programming or knowledge of neural networks) is not necessary for most employees. Instead, what's needed is a **practical, role-specific understanding** of how to use AI to enhance daily tasks, supported by training in AI-supported tools and soft skills like adaptability and communication.

Critical Thinking and Ethical Awareness: Interviewees stressed the need for critical assessment of AI results and ethical implications (Germany, Interview 5; Italy, Interview 6).

Some quotations from the interviews illustrate these findings:

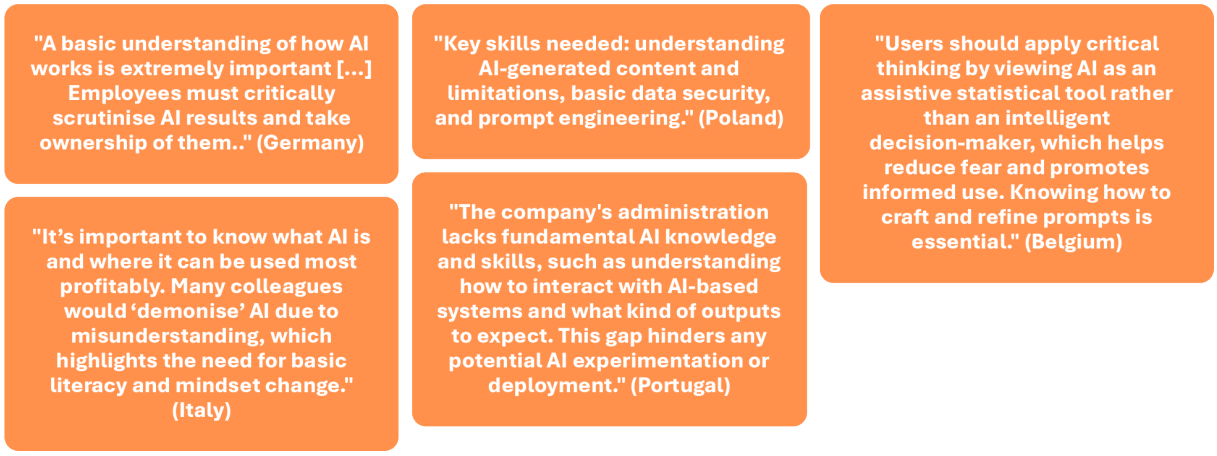


Figure 10: Quotations from interviews regarding skill gaps

Alignment of Identified Skills Gaps with Business Needs

The skills gaps identified align strongly with the way businesses are currently experimenting with AI. Many SMEs are in the early or exploratory stages of AI integration, often relying on small groups of forward-thinking staff to pilot tools.

Common business drivers include:Improving efficiency (automation of tasks like content generation, data analysis).

- Enhancing customer engagement and marketing.
- Supporting decision-making with AI-assisted insights.

The identified gaps are tightly aligned with practical business demands:

Operational Efficiency: Companies integrating AI for marketing, customer service, and data processing need employees who can understand and leverage these tools (Italy, Interview 1; Poland, Interview 2).

Role-Specific Applications: SMEs need contextual AI understanding tailored to roles – e.g., legal professionals needing tools for document summarization or analysis (Italy, Interview 2).

Scalability & Competitiveness: Many SMEs view AI not just as a tool, but as a strategic enabler of scale and market agility, which depends heavily on internal AI fluency (Belgium, Interview 4; Portugal, Interview 5).

Compliance and Regulation Readiness: As regulations like the AI Act evolve, businesses require awareness and training to ensure compliance, which non-technical staff currently lack (Portugal, Interview 3; Germany, Interview 5).

However, several businesses pointed out that lack of AI understanding among staff limits the broader adoption of these tools. As such, there is a clear alignment: to capitalize on AI, companies need to equip employees – especially non-technical ones – with foundational AI-Literacy and confidence in usage.

The quotations from interviews:

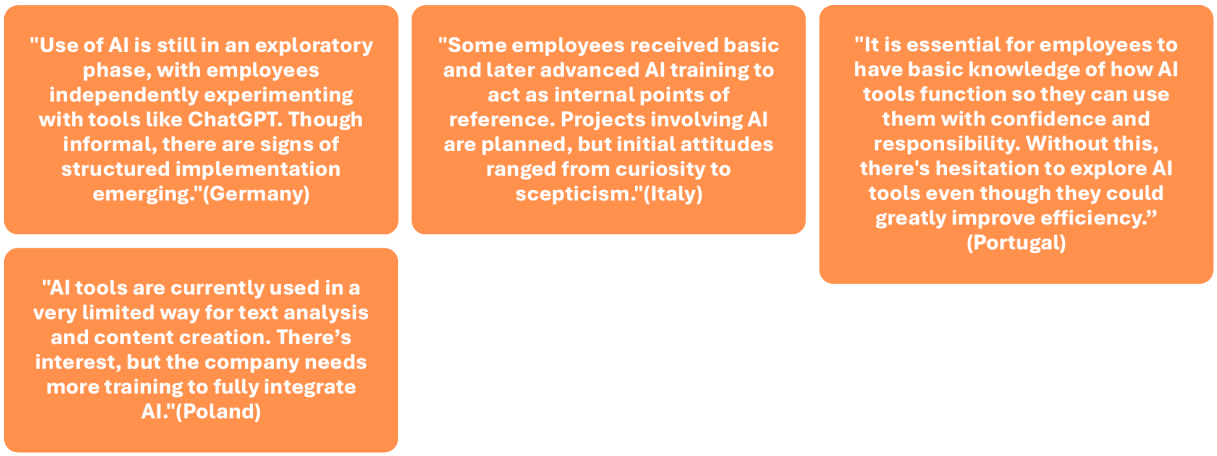


Figure 11: Quotations from interviews regarding alignment of skill gaps and business need

Barriers and Challenges in AI Adoption

Several common barriers emerged across all five countries:

- Lack of structured AI training programs - leaving employees to self-educate through trial and error. Few companies reported structured or ongoing AI training, especially for non-technical employees (Belgium, Interview 1; Poland, Interview 3; Portugal, Interview 4).
- Technological misunderstanding and fear as many employees show hesitation, fear of being replaced, or resistance to changing workflows (Germany, Interview 2; Italy, Interview 3).
- Regulatory ambiguity is a widespread issue with unclear internal or national AI governance. Many SMEs are uncertain about ethical use and data protection obligations (Portugal, Interview 4; Belgium, Interview 4).
- Cost and resource constraints especially for smaller companies, investing in AI tools and training remains financially challenging (Italy, Interview 5; Poland, Interview 6).
- Overreliance on external expertise since many SMEs depend on consultants or external vendors due to lack of in-house AI capabilities, slowing internal competence development (Portugal, Interview 1; Germany, Interview 3).

Interviewees also identified a mix of organizational, psychological, and infrastructural challenges, including:

- Resistance to change, particularly from older employees or those sceptical of AI's reliability or relevance.
- Data privacy and regulatory concerns, especially when using cloud-based tools.

- Limited managerial strategy, where AI initiatives are often fragmented or experimental without broader organizational buy-ins.

While there is notable interest in AI, organizations frequently express uncertainty about return on investment, potential workforce impacts, and optimal strategies for scaling AI adoption. Cultural attitudes, along with constraints on time and resources for upskilling, also influence the pace of implementation.

Figure 12: Quotation from interviews regarding barriers and challenges

In addition to these findings, the open questions yielded additional fruitful information:

- **Innovative Approaches**: Some companies have launched grassroots initiatives like AI learning circles or experimentation platforms (Belgium, Interview 2; Italy, Interview 3).
- **Sectoral Differences**: IT-related sectors show more advanced integration and understanding of AI, while tourism, legal, and food industries exhibit lower maturity (Portugal, Interview 2 vs Interview 3).
- **Call for Modular Training**: Interviewees favor short, role-adapted, and non-technical AI training formats over complex or theoretical programs (Poland, Interview 4; Italy, Interview 6).

The interview results reflect a strong shared experience among SMEs across all five countries: enthusiasm for AI's potential, a recognition of skills gaps at the non-technical level, and a need for strategic and educational support to ensure effective and inclusive adoption (for detailed country reports see appendix).

4.2. Online-survey with non-technical employees

Methodological setting of online-survey

The **aim** of the standardized online survey is to find out from the employees' perspective where they encounter AI in their day-to-day work, how they use it, how they perceive their own skills and where they need support.

The **sample** of in total 151 employees with non-technical and non-IT backgrounds from the five partner countries took part in the survey.

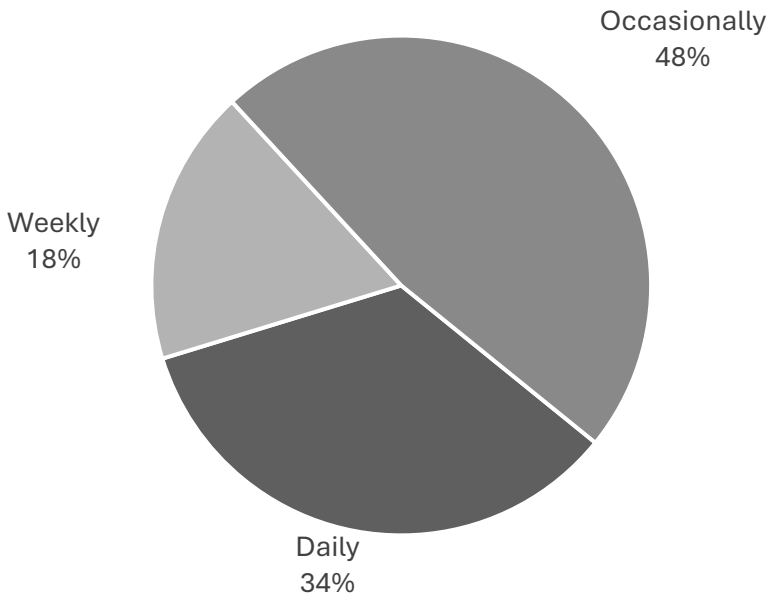
To collect data via the **online survey a questionnaire** was generated inquiring following aspects:

- Background and AI usage, e.g. training, frequency of AI use at work, AI-tools used
- Recognizing AI and user understanding, e.g. ability to identify AI systems, knowledge about machine learning, trust in reliability of AI-generated outputs
- Practical AI knowledge, e.g. experience with AI-generated outputs
- AI principles and ethical understanding, e.g. bias, transparency, privacy concerns
- Technical skills and domain specific AI knowledge, e.g. translate AI insights into business decisions, AI development
- AI training and future learning needs, e.g. AI training for employees, barriers and optimization ideas

The questionnaire consisted primarily of closed questions, but also used open questions in some places, in particular to gain insight into optimization ideas from the employees' perspective.

4.2.1. Results

The 151 participants from Belgium, Germany, Italy, Poland and Portugal represent a wide variety of industries and positions and range from e.g. administrative employees to bank officials, beauticians to climate protection manager and estate agent.

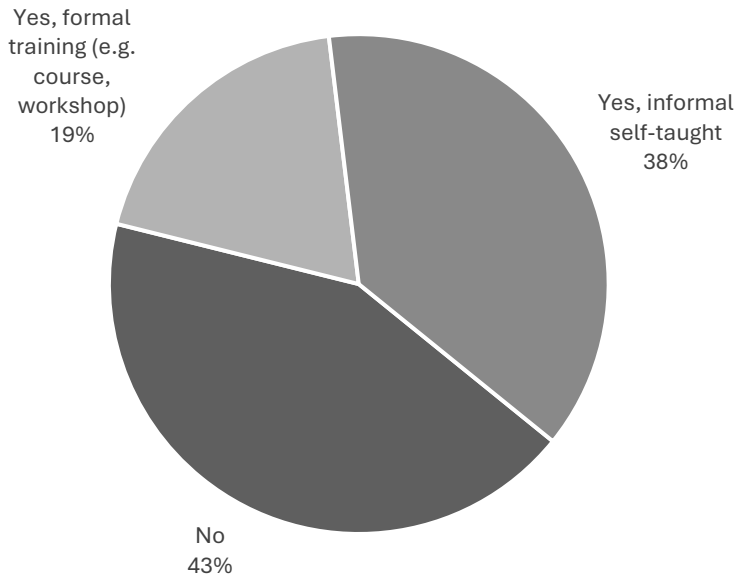


All of them use AI powered tools at work. A third use them daily, just under a fifth weekly and around half only occasionally.

This means that AI appears to have found its way into the working reality of employees in the partner countries – even if it is not yet part of the working routine in many cases.

Figure 13: How frequently do you use AI-powered tools at work? (n=151)

Chatbots (e.g. Chat GPT and Microsoft Copilot) are used most frequently, one in four uses AI tools for data analysis (e.g. MS Power BI, Tableau, MS Excel 365, SAP) and one in six uses automation tools (e.g. MS Copilot, Cohere, IBM Watson X Assistant).



The striking thing is only 19% of respondents have taken part in formal training (e.g. a course or workshop). 38% state that they have completed informal, self-organized training or have taught themselves the knowledge. Over 40% have received neither formal nor informal training.

Figure 14: Have you received any formal or informal training in AI tools or systems? (n=151)

More than half of the participants believe that AI improves their daily workflow (confident/very confident). However, around one in five are (not at all) confident with the effectiveness.

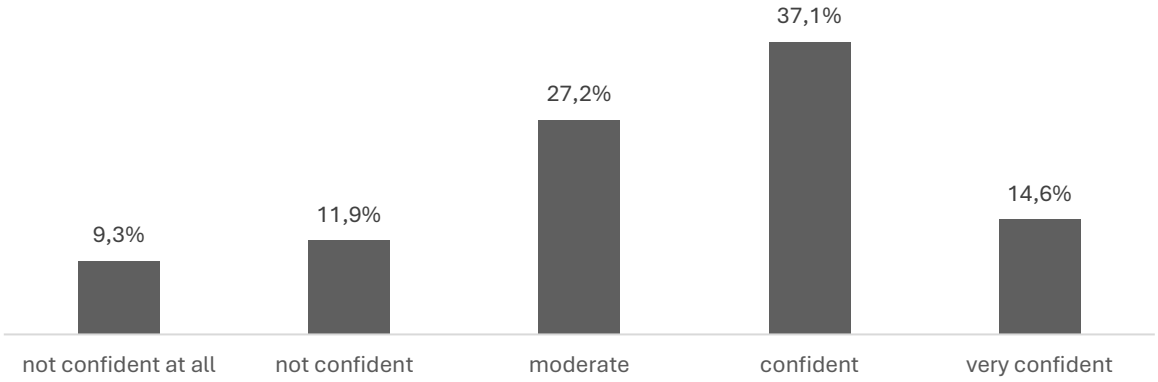


Figure 15: How confident are you in using AI tools to improve your daily workflow? (n=151)

A more detailed look reveals the added value of formal training: While only 35% of those who have not received any training are (very) satisfied with the impact of AI on their daily workflow, the proportion of (very) satisfied participants among those who have received formal AI training is twice as high. Competent handling of AI thus visibly increases its positive effects.

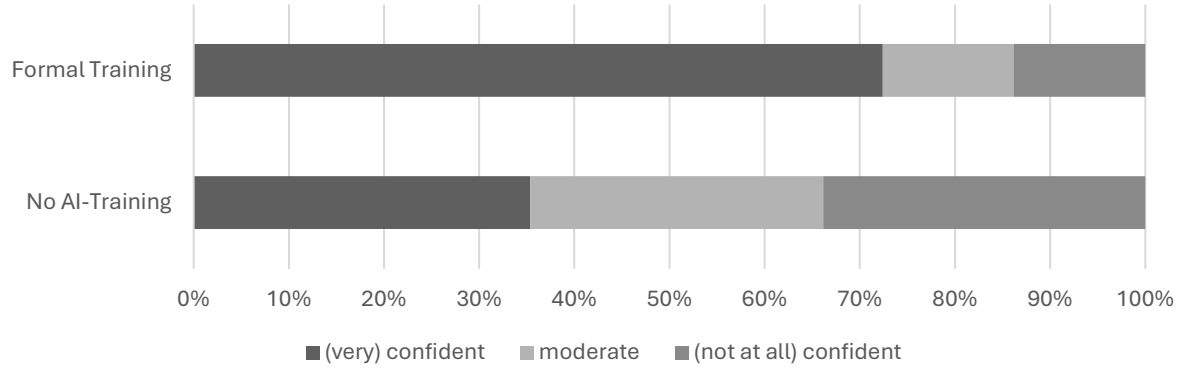


Figure 16: Satisfaction with positive effects of AI on workflow depending on formal training (n=94)

The survey in the five partner countries also shows that many employees without a technical background are very uncertain about how to deal with AI. This starts with perceived gaps in knowledge: Only half believe they can confidently distinguish between AI-driven and traditional software. Less than 20% say they don't understand the concept of machine learning and how AI systems analyse data and produce results.

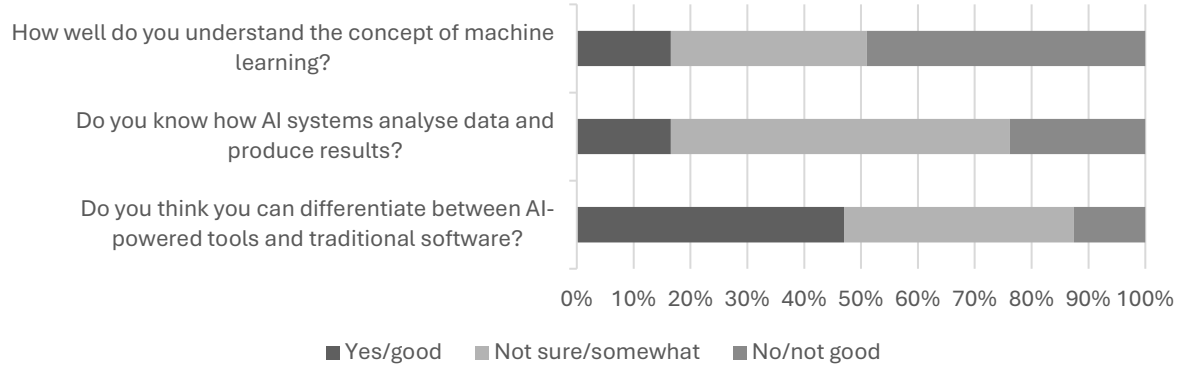


Figure 17: Self-assessment of knowledge about AI (n=151)

The fact that three quarters of respondents answered the knowledge questions on AI correctly shows that partial knowledge is available. However, this does not lead to employees being confident in their actions.

Another result confirms this assumption: although almost 90% of respondents state that AI tools have already provided them with incorrect or misleading results, only 60% have given the system feedback for optimization or adjusted the AI settings.

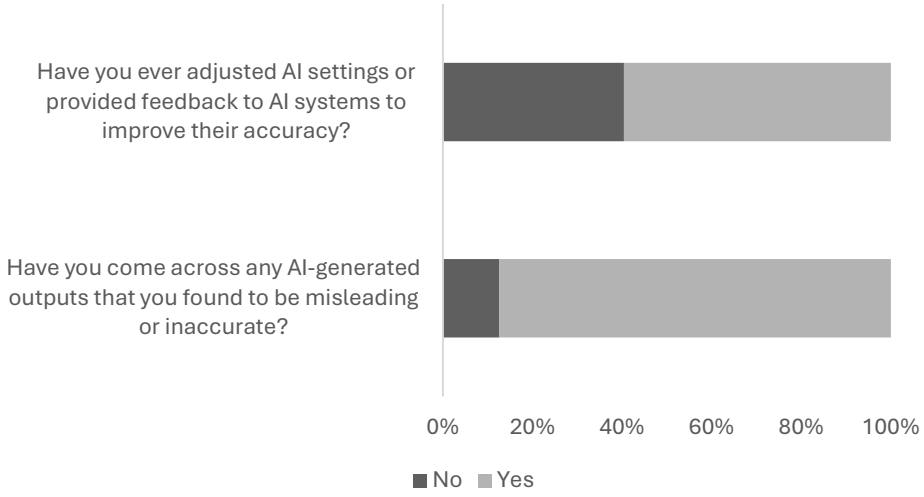


Figure 18: Dealing with errors in AI output, n=151

It appears to be potential for optimization in the communicative dimension of AI competence, which makes it easier for employees to enter into an exchange with the application, the developers and other users in order to learn from failures in use.

The respondents see many risks - quite realistic ones - associated with AI: They are most concerned about data security (112 out of 150 respondents), followed by fear of misinformation and manipulation (106 out of 150). Almost 60% of respondents (89 out of 150) are concerned about the distorting, discriminatory effects of AI-generated solutions (e.g. bias).

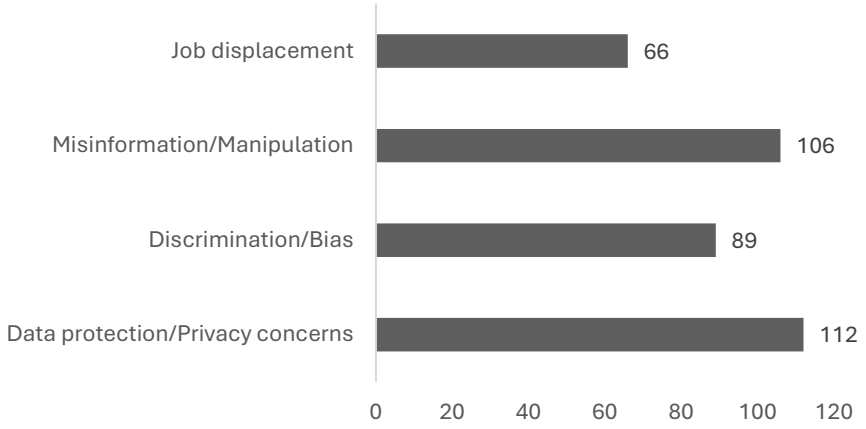


Figure 19: Ethical concerns, n=150, multiple answers possible

These concerns appear to be less the result of an informed assessment and more the result of a diffuse fear. After all, when asked “How well do you understand AI principles such as bias (systematic inequalities), transparency (decision traceability), and fairness

(avoiding unjust discrimination) in AI decision-making?", only 24 of the 150 respondents gave a clearly positive answer.

Most respondents are convinced that AI is important or very important for the future of their company/industry. They think the greatest benefit of AI for their company/branch is the optimization of efficiency and automation (122 out of 150 respondents). Many also consider AI assistance in the evaluation of data to be promising (97 out of 150).

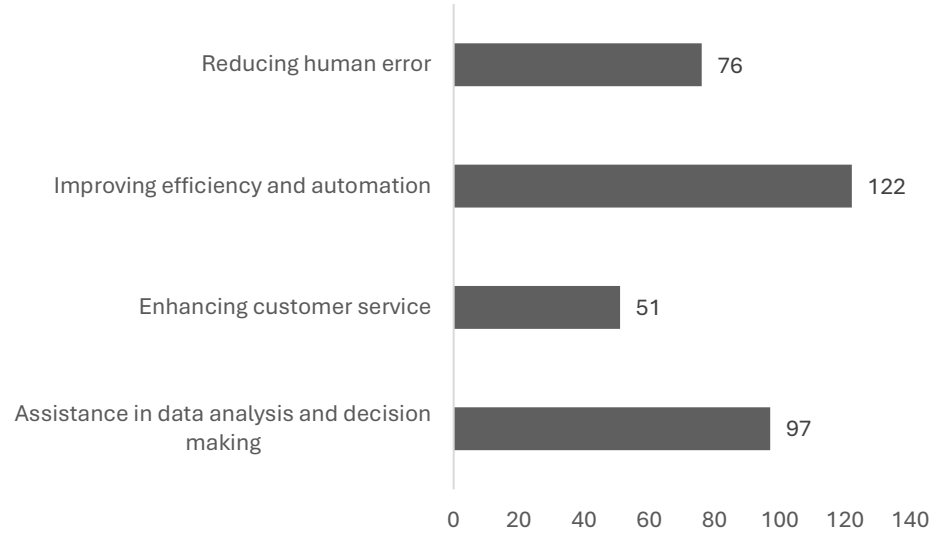


Figure 20: Biggest potential benefits of AI, n=150 multiple answers possible

The interest in participating in AI training is very high: Around 90% would participate in an AI training program at their company. However, this interest is met with an inadequate offer: Less than 20% of respondents perceive their company's own AI-trainings offering as sufficient.

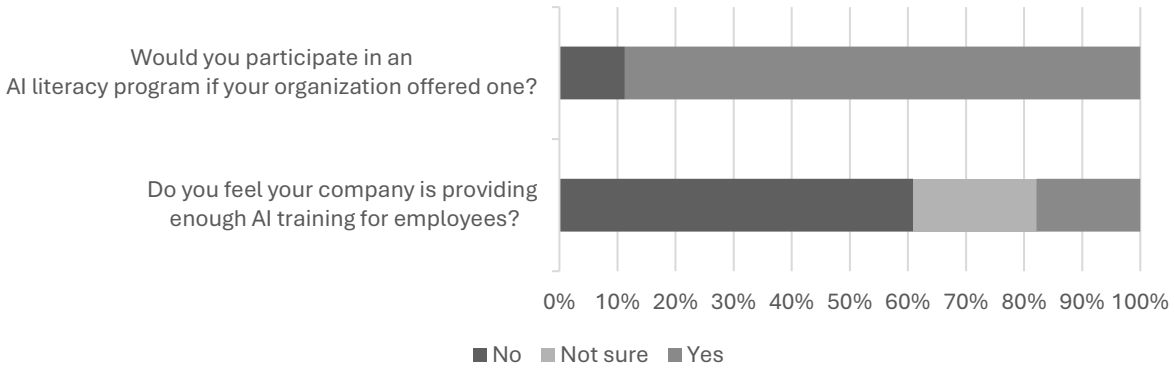
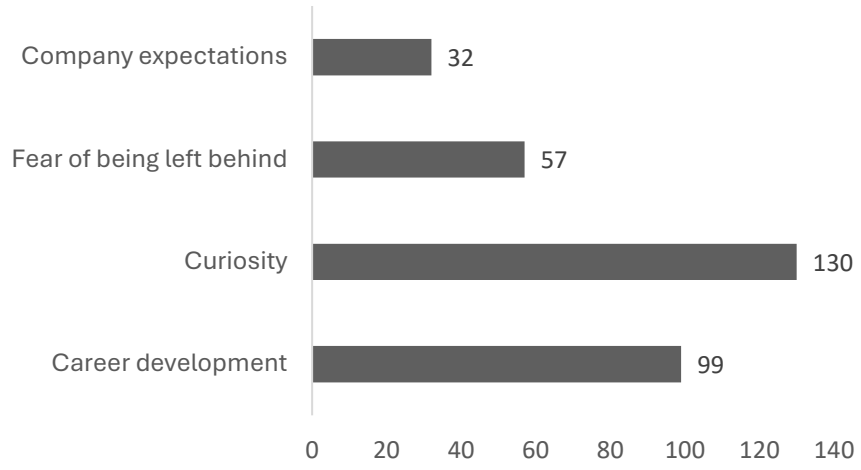


Figure 21: AI training in company, n=150

The motivation to participate in AI training is strongly intrinsic (see figure 22): Nearly 90% state that they want to undergo further training out of curiosity about the topic. For two-thirds of respondents, AI expertise is a prerequisite for advancing their own career.



More than a third of respondents are driven by the fear of being left behind.

Figure 22: Motivation for AI training, n=150, multiple responses possible

The main barrier preventing employees from participating in AI training is a lack of time, closely followed by a perceived lack of training programs. Almost half of the respondents state that the complexity of the topic of AI is a barrier to participating in training. A detailed look shows: This fear is particularly widespread among those who say they do not have a firm basic knowledge of how AI works. This also shows that ignorance fuels reservations.

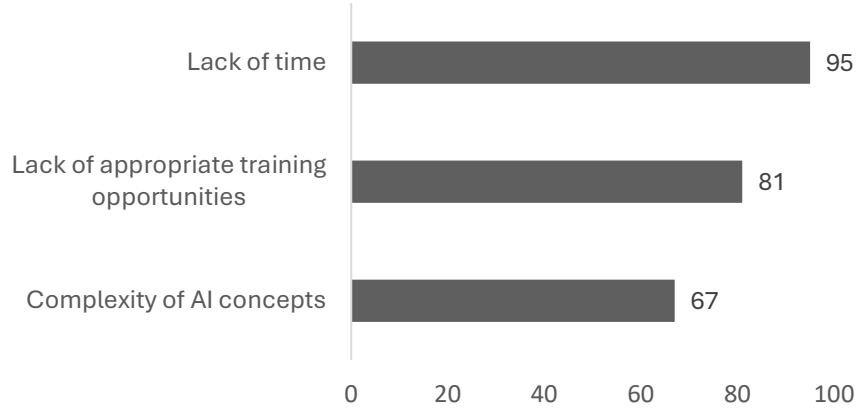


Figure 23: Barriers to participation in training courses, n=150, multiple responses possible

When asked what organizations should do to optimize AI skills among non-technical employees, the answer from the 150 respondents was unanimous: training.

The following quotes provide a good insight into the expectations of employees.

Figure 24 Quotation from survey regarding expectations for qualification

4.3. Focus Groups with experts

Methodological setting of focus groups

The **aim** of the focus groups is to identify relevant AI skills in the professional context, to gather findings on organizational framework conditions in companies, to discuss topics and didactic formats for teaching AI skills in in-company training and to shed light on the idea of the AI Skills Scanner.

The focus groups were conducted in all five partner countries (Belgium, Italy, Germany, Poland and Portugal). They consisted of **five to seven experts** who deal intensively with AI in a professional context. Depending on their function, they looked at the topic from very different perspectives, e.g. from the perspective of the company manager, the head of the HR department, as an expert in training and development or as an expert in digital transformation. Where possible, the focus groups were conducted face-to-face. They were led by teams of two moderators. Interactive elements were used to achieve a high level of activation among the participants.

To gather meaningful insight a **qualitative guideline** was created focusing following topics:

- Important AI-Literacy Gaps in the four AI-Literacy dimensions Mental State, AI Knowledge, AI Practice, AI Reflection
- Organizational frame: How can organizations/companies support non-technical employees in acquiring AI skills? (Corporate Culture, Change Management, resources, qualification)

- Collection and discussion of formats and methods for teaching AI skills in vocational training (training topics, didactic, formats, conditions)
- Discussion of the idea of an AI Skill Scanner, a digital tool to assess one's own AI-Literacy proficiency level, aligning with the identified skills and competencies and linked with the learning material that will be created in this project

4.3.1. Results of focus groups

Across all five countries, participants represented a diverse mix of roles - including CEOs, CTOs, managers, technical experts, consultants, educators, and graphic designers—working in sectors such as IT, marketing, HR, tourism, logistics, education, software, and accounting. Most companies were SMEs, with sizes ranging from micro-enterprises (1–10 employees) to mid-sized firms (up to 400 employees). Geographic representation covered urban and regional areas, with an emphasis on industry diversity and applied AI experience.

Key Findings

AI-Related Competency Gaps and Mindset Barriers

Participants across all countries recognized the relevance of the identified AI competence dimensions (Mental State, Understanding, Behavior, Reflection). A significant shared concern was the presence of mental barriers, including fear, resistance, and anxiety - especially among less tech-savvy employees. Belgium and Germany highlighted the need for confidence building and resilience towards change, while Italy and Poland emphasized overcoming fear of job displacement and shifting organisational cultures.

The notion of fostering a growth mindset, characterized by curiosity, openness, and future-orientation, was widely supported. In Germany and Portugal, developing resilience, trust, and a constructive attitude towards AI was viewed as fundamental to enabling uptake and innovation.

Foundational Knowledge and Misconceptions

The need for foundational AI Literacy—understanding how AI works, recognizing data limitations, bias, and basic technical concepts—was echoed in all reports. Germany and Poland stressed the importance of contextualizing AI outputs, and understanding how human cognition interacts with AI-generated insights. Participants warned against over-reliance on AI tools without knowing their constraints.

In Belgium, Italy, and Portugal, clarifying misconceptions (e.g., about data usage and AI licensing) and providing clear, accurate information were seen as essential first steps in any training journey.

Training Approaches: Hands-On, Relevant, and Ongoing

Participants strongly favored pragmatic, workplace-integrated learning, with a clear consensus across all countries on the importance of learning-by-doing. Hands-on training, microlearning, peer mentoring, and the creation of safe, exploratory environments were highlighted as effective methods. Both Belgium and Germany underlined the value of mentorship and gradual onboarding.

There was wide agreement that training should reflect real use cases, be tailored to organisational context, and involve ongoing support. In Italy and Poland, micro credentials and flexible formats were preferred to address time constraints and workload.

Organisational Readiness and Culture

Several groups stressed that individual learning must be matched by organisational readiness. Cultural resistance, lack of leadership awareness, and absence of strategic AI integration were cited as major barriers. Participants from Portugal and Poland highlighted the importance of embedding AI into company culture, encouraging leadership to lead by example, and facilitating team discussions about AI usage and ethics.

Supportive infrastructures - including IT systems, governance policies, and forums for reflection - were considered necessary for sustainable adoption.

AI Skill Scanner: Perceptions and Suggestions

The AI Skill Scanner tool was widely seen as a valuable and innovative concept, useful for assessing baseline AI-Literacy and guiding training. However, concerns were raised (especially in Italy and Portugal) about the feasibility of a one-size-fits-all approach, due to the varied nature of AI use across roles and sectors.

Participants suggested improvements such as gamification, accessibility features, customizability, and alignment with real-world tasks. Credibility was also important—Polish participants recommended university endorsement to build trust.

Selected participant quotes

"More than one concrete training, it is needed a long-term partnership." (Belgium)

"Companies must make it possible for their employees to simply try things out. Just do it!" (Germany)

"Used wisely, AI becomes a partner in our upskilling journey, not a threat to it." (Italy)

"For the young generations AI is a native environment and the rest will adopt AI like we did smartphones." (Poland)

"Managers of SMEs should lead by example. Leaders must be a source of inspiration." (Portugal)

Recommendations

- Support learning with appropriate infrastructure and provide safe environments, platforms for discussion, knowledge sharing spaces, and technical frameworks (e.g. secure test environments, governance policies).
  (Germany, Portugal, Poland)
- Encourage peer mentoring and collaborative learning and leverage internal expertise to support staff, foster informal learning, and provide incentives for internal mentors.
  (Poland, Belgium)
- Design flexible and engaging tools and ensure the AI Skill Scanner is adaptable to various contexts, uses accessible language, includes gamification and multimedia elements, and has credibility (e.g. university backing).
  (Portugal, Italy, Poland)
- Tailor training formats to time constraints and use short, focused, and modular learning units (e.g. microcredentials) to fit into busy work schedules.
  (Italy, Germany)

- Implement a pragmatic, positive approach and encourage confidence in AI adoption, clarify common misconceptions, and support a mindset shift from fear to curiosity. (Belgium, Italy, Germany, Portugal)
- Develop contextual and hands-on training with a focus on realistic use cases, learning-by-doing, microlearning formats, and ongoing support. Avoid overly theoretical content. (Germany, Belgium, Italy, Poland, Portugal)
- Embed AI in organisational culture and promote openness to change, involve staff in experimentation, and build a culture of innovation where AI is seen as a normal tool. (Poland, Italy, Portugal)
- Promote leadership engagement and train managers first so they can lead by example and inspire staff. Leadership buy-in is essential for culture shift and AI integration. (Portugal, Poland, Italy)

4.4. Summary of the findings and conclusions

The combined findings from interviews, focus groups, and an online survey provide a rich and detailed picture of AI adoption in European SMEs. Across countries and sectors, AI is widely recognized as a powerful driver of efficiency, innovation, and data-driven decision-making. Employees and managers alike understand its strategic relevance for future competitiveness, yet adoption remains uneven. Competence gaps, varying levels of confidence, limited training opportunities, and mindset barriers constrain the effective integration of AI into everyday work.

The study examined AI skill needs across multiple levels, including individual employees, management, and organizational structures. Literature reviews and country reports highlighted a broad spectrum of AI competencies, ranging from basic understanding and technical skills to ethical reflection and critical thinking. Organisational prerequisites—such as support structures, regulatory awareness, access to training, and an innovation-friendly corporate culture—were equally important for fostering adoption.

The results of the **online survey** highlight an urgent need for structured AI competence training among non-technical employees. Despite frequent exposure to AI tools, more than 40% have received no formal or informal training, which correlates with lower confidence and limited effective use. Employees particularly lack foundational knowledge of AI principles such as machine learning, bias, and transparency, which hinders both critical engagement and responsible application. Furthermore, ethical

concerns—especially around data security and misinformation—reflect uncertainties that could be mitigated through targeted training. Overall, employees demand accessible, time-efficient training formats that strengthen both practical AI skills and ethical awareness

Expert interviews across five countries reveal that companies urgently require AI competence training tailored to non-technical employees. Core needs include foundational AI literacy, data interpretation, prompt engineering, and critical thinking in ethical contexts. Soft skills such as adaptability and communication are essential complements to technical understanding. Businesses demand practical, role-specific training to support operational efficiency, regulatory compliance, and strategic scalability. Modular, accessible formats are preferred to overcome barriers such as fear, resource constraints, and organizational inertia.

Focus group insights emphasize the need for practical, context-specific AI training that prioritizes real-world application over theory. Key training demands include short, modular formats, hands-on learning, and tools like AI skill scanners to assess progress. Non-technical employees require support through a positive learning culture, peer mentoring, and leadership engagement. Organizational infrastructure—such as safe test environments and open communication platforms—is essential for sustainable AI integration. Ultimately, training must foster curiosity, reduce fear, and embed AI use into everyday business practices.

The three studies converge on several key points. First, all underline a strong and urgent need for structured AI competence training for non-technical employees. Second, they emphasize the importance of building **foundational AI literacy**—covering both technical basics (e.g., data interpretation, machine learning concepts) and ethical dimensions (e.g., bias, transparency, data security). Third, the studies highlight the demand for **practical, modular, and accessible training formats** that can be integrated into employees' everyday work without imposing excessive time burdens. Fourth, they stress the role of **organizational support and culture**, including leadership engagement, peer mentoring, and safe spaces for experimentation, in fostering sustainable learning. Finally, all three recognize that AI training must not only transfer technical knowledge but also **address fears, build confidence, and promote curiosity**, thereby enabling employees to use AI responsibly and effectively.

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