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AI Upskilling Promoting Peer-to-Peer Learning Using Self-Selected Real-Work Use Cases

Leonie Kuhn[1], Carsten Schmidt[2], Wolfgang Beinhauer[2], Bernd Dworschak[2], Alexander Karapidis[2], Kathrin Schnalzer[2], and Katharina Hölzle[1,2]

[1]Institute of Human Factors and Technology Management IAT, University of Stuttgart, Stuttgart, Germany
[2]Fraunhofer Institute for Industrial Engineering IAO, Stuttgart, Germany

ABSTRACT

Generative AI is transforming knowledge-intensive work and increasing the need for employees to develop skills for the responsible and effective use of generative AI. Companies therefore face challenges in supporting AI upskilling, including heterogeneous prior skill levels, difficulties in identifying use cases for AI-supported work, and the need for continuous, context-specific learning. This paper presents an AI upskilling approach based on work and learning projects (ALP), enabling employees to engage with generative AI by means of self-selected real-work use cases. The approach is based on work-integrated learning and combines structured methodological guidance with authentic work tasks to promote situated and transferable upskilling. The AI upskilling was implemented with employees at the Fraunhofer Institute for Industrial Engineering IAO, who selected real tasks from their daily work and processed them using a standardized sequence of learning steps. A dedicated website supported the process by providing tutorials, use case inspirations, and a prompt library for documenting and sharing prompts. Peer-to-peer learning sessions enabled employees to exchange experiences, validate emerging learnings, and collaboratively reflect on challenges encountered during AI-supported work. The results indicate that combining embedded practice, self-selected task processing, methodological scaffolding, and peer collaboration fosters the development of essential AI-related skills, including prompting, critical curation of AI outputs, and contextualization. The AI upskilling approach supports scalable and sustainable skill development and demonstrates how work-integrated learning formats can prepare employees to use generative AI responsibly and productively in dynamic, digitalized work environments.

Keywords: AI upskilling, Work-integrated learning, Work and learning project, Skills, Peer-to-Peer learning, Generative AI, Real-work use cases, Knowledge-intensive work

INTRODUCTION

Generative AI is increasingly transforming knowledge-intensive work by augmenting information processing, content creation, and analytical tasks (Brynjolfsson et al., 2025). Research shows that AI reshapes skill profiles and shifts the demand toward higher-order cognitive work, making adaptive learning and continuous upskilling essential in modern organizations

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(Muehlemann, 2025). As organizations adopt these technologies, employees are expected to develop the skills needed to work effectively with AI systems and to integrate them into daily workflows to enhance performance and decision-making. This shift reflects broader findings on how AI adoption alters job requirements, amplifies cognitive load, and requires new forms of expertise and judgement (Jaiswal et al., 2022).

At the same time regulatory frameworks such as the EU AI Act emphasize the necessity of organizational AI literacy. Article 4 of the AI Act requires organizations to ensure that employees possess sufficient knowledge and skills to use AI systems responsibly and appropriately in their work contexts (European Union, 2024). This corresponds to empirical findings that AI literacy – understood as the ability to understand model logic, evaluate system outputs, and recognize risks and limitations – is a fundamental skill in AI-enabled workplaces (Kintz et al., 2024; Riaz, 2025). In response, the Fraunhofer Institute for Industrial Engineering IAO provided employees with access to generative AI tools and initiated a corresponding AI upskilling program to strengthen their ability to use AI responsibly and productively in knowledge-intensive work.

Challenges to AI Upskilling

Upskilling for generative AI entails several challenges. First, employees differ in their existing skills. Studies show that many workers lack essential AI-related notions such as understanding data dependencies, model behavior, uncertainty, and system limitations – skills that are indispensable for making informed judgements about AI generated content (Jaiswal et al., 2022; Riaz, 2025). This lack of conceptual understanding reduces confidence and makes it difficult to assess the plausibility and reliability of AI outputs. Frameworks for AI upskilling emphasize that employees have to be able to interpret system behavior, critically evaluate model suggestions, and situate AI outputs within domain-specific knowledge structures (Santana and Díaz-Fernández, 2022).

Second, employees often work on diverse and complex knowledge tasks, making it initially unclear which activities are suitable starting points for AI-supported work. Research on AI skill requirements shows that workers frequently struggle to identify fruitful entry points for experimentation and require structured support in recognizing tasks that can be meaningfully augmented by AI (Jaiswal et al., 2022). Productive experimentation requires dialogic interaction skills: employees have to learn to formulate effective prompts, iteratively refine AI outputs, and work with generative AI through conversational feedback cycles (Annapureddy et al., 2025). These interactional skills form parts of emerging AI-augmented cognitive skill profiles that combine digital literacy, critical thinking, and domain-specific judgement (Riaz, 2025).

Moreover, AI upskilling has to be understood as a continuous process. Generative AI systems evolve rapidly, and employees need adaptive learning skills to keep pace with technological change. Research underlines that iterative practice, repeated exposure to AI tools, and opportunities for reflection and peer exchange are essential for developing stable and transferable skills

(Jaiswal et al., 2022; Riaz, 2025). Employees have to continuously adapt their skills, and update work routines in co-evolution with technological progress (Yu, 2025).

Another challenge refers to the learning format. The literature emphasizes that AI-related professional development has to be embedded in real work contexts. AI tools create value primarily when they are applied to authentic tasks rather than abstract training scenarios. Empirical studies on AI-supported work show that contextualization – the ability to interpret AI outputs within organizational constraints, customer needs, and domain logics – is a relevant skill for effective AI use (Santana and Díaz-Fernández, 2022; Riaz, 2025). Therefore, work-related learning leads to employees developing AI skills for their specific work tasks. This integration highlights a third skill: contextualization. AI outputs rarely contain inherent meaning; employees have to translate them into the logic of the business domain, consider customer needs, organizational constraints, or ethical implications, and transform technical suggestions into actionable steps (Yu, 2025).

Work-Integrated Learning

The concept of *work and learning projects* (ALP; *Arbeits- und Lernprojekte* in German) represents a structured approach to work-integrated learning that enables employees to select learning content according to their existing skill level and work tasks. By allowing employees to choose their own work and learning tasks, ALP accommodate heterogeneous prior knowledge and diverse job requirements, supporting personalized and meaningful learning paths (Schröder, 2009). Central to the concept of ALP is the principle that learning occurs through work: real work tasks become learning tasks, maintaining their authentic structure while being didactically enriched to guide competence development. These tasks are decomposed into sequential learning steps – such as researching information, planning actions, executing tasks, documenting deviations, and reflecting on outcomes – thereby making complex work processes learnable and transparent (Schröder, 2009). This structure corresponds to research highlighting that learning embedded in real work processes supports the acquisition of complex, transferable skills required in AI-enabled environments (Jaiswal et al., 2022; Santana and Díaz-Fernández, 2022). A further skill required in ALPbased AI upskilling is strategic task allocation between humans and AI systems. Research on AIenabled work emphasizes that employees have to understand which tasks are suitable for automation, which require human judgement, and how to combine human insights with AIgenerated suggestions effectively (Jaiswal et al., 2022; Riaz, 2025).

Peer-to-Peer Learning

Peer-to-peer learning is an integral component of this process: learners consult colleagues, discuss emerging problems, and validate their reflections through communicative exchanges, which enhance both cognitive processing and social learning (Schröder, 2009; Struck, 2023). Peer-to-peer learning

within ALP constitutes a central mechanism for enhancing work-based competence development, as it creates a collaborative environment in which learners jointly build up knowledge and solve authentic work tasks. Research on ALP demonstrates that learning teams enable the exchange of experiential and tacit knowledge essential for mastering complex, non-routine tasks embedded in real production contexts (Bauer et al., 2007). Such cooperative structures foster deeper cognitive processing because learners have to articulate reasoning, negotiate solutions, and critically reflect on alternative approaches. Moreover, peer collaboration strengthens social and communicative skills recognized as pivotal in modern work environments characterized by increased digitalization and interdisciplinary coordination (Binder and Hofmann, 2020). The self-directed and participatory nature of ALP further increases learners' ownership of the learning process, leading to higher motivation, transferability and sustainability of acquired skills. Consequently, integrating peer-to-peer learning into ALP not only supports technical skill acquisition but also cultivates the general skills required for effective performance in dynamic and technology-rich workplaces. Peer learning within ALP constitutes a central mechanism-based competence development, as it creates a collaborative environment in which learners jointly construct knowledge and solve authentic work tasks.

Finally, ALP supports cognitive augmentation, the ability to use AI as a thinking tool. While AI processes and aggregates information, employees have to identify meaningful patterns, engage in systems thinking, apply design thinking approaches, and derive informed decisions from AI-generated material (Yu, 2025). Research underlines that systems thinking, analytical reasoning, and decision-making skills are crucial future skills in AIenhanced work (Jaiswal et al., 2022; Riaz, 2025).

The combination of self-selected use cases, embedded practice, incremental structuring, and peer-to-peer learning enables situated and experience-based AI upskilling that is particularly suited to knowledge-intensive, digitalized, and dynamic work environments. Such formats support autonomy, contextualization, and continuous adaptation – skills that have been identified as central for effective performance in AIenabled organizational settings (Santana and DíazFernández 2022; Riaz, 2025). Based on these considerations, the AI upskilling has been guided by the following question: *How can a work and learning project be designed to enable effective AI upskilling for knowledge-intensive work, promoting peer-to-peer learning and using self-selected real-work use cases?*

DEVELOPING A WORK AND LEARNING PROJECT FOR AI UPSKILLING

The AI upskilling described in this contribution was conducted with employees of the Fraunhofer Institute for Industrial Engineering IAO carrying out knowledge-intensive work. All participants already had experience with generative AI but were still developing their proficiency and confidence in applying these skills in the context of complex tasks.

As a foundation for the AI upskilling, a systematic collection of employees' work tasks was compiled. This portfolio of authentic tasks was subsequently compared with the functional capabilities of generative AI technologies. The analysis focused particularly on common AI features, such as gathering information, analyzing texts, creating presentations, generating images, providing feedback and support, and analyzing data, to determine which tasks could be meaningfully supported by these tools. This comparison enabled the identification of task types for which generative AI offered clear potential benefits and provided the basis for deriving use case inspirations presented to the learners.

One distinctive feature of the AI upskilling was that all tasks were processed using a uniform methodological sequence. This distinguishes this AI upskilling project from other work and learning projects. Instead of developing separate learning modules for each individual work task, a common set of learning steps was designed to guide learners through the application of generative AI across diverse task types. This structure reflects the underlying principle that AI upskilling does not require the creation of additional or task-specific learning content; rather, it equips employees with a transferable procedure that can be applied to any relevant work activity. By standardizing the learning process, the AI upskilling ensured both scalability and consistency, while still allowing learners to work on tasks directly drawn from their everyday responsibilities.

In addition to the standardized learning process, the AI upskilling design also incorporated explicit mechanisms for knowledge sharing and collaborative reflection. A central element was the prompt library, in which employees documented their developed prompts or the iterative refinement of existing ones. By assigning each prompt to a corresponding skill level, the library served not only as an individual reflection tool but also as a collective knowledge repository that enabled colleagues to build on one another's work. Furthermore, two peer-to-peer learning sessions complemented the self-directed learning phases. In these sessions, employees presented their self-selected use cases, shared challenges encountered during the application of generative AI, and discussed insights gained from prompt development.

Implementation

The AI upskilling was facilitated by means of a dedicated website designed to guide employees through a structured, multi-step learning process. The platform functioned as an integrated support environment, aggregating all essential resources – including links to video tutorials, a prompt library, and a clearly articulated sequence of learning steps enabling employees to effectively engage with and apply generative AI in their work practices.

First, all learners were instructed to watch an introductory video that provided fundamental information about *Microsoft Copilot*. In addition, an optional tutorial on effective prompting was made available, introducing the ROMANE approach as a systematic method for constructing prompts (Eggers, 2024).

Following this initial exposure, participants were encouraged to assess their current skill level in using generative AI. Afterwards learners selected a real work use case they wished to accomplish with the support of generative AI. To facilitate this individualized application, the website offered subpages for various general use cases. These subpages provided inspiration regarding the types of tasks that could be supported by AI and outlined the respective following learning steps:

1. Watch the videos and review example prompts provided for the general use case.
2. Define the criteria that will be used to evaluate the results of the generative AI.
3. Develop a prompt.
4. Use and compare different AI tools.
5. Review and reflect on the results.
6. Document the final prompt and insights gained in the prompt library.

Each use case subpage included video tutorials as well as exemplary prompts tailored to that context. The learners' tasks were to work through the prescribed learning steps while applying them to their selected real work use case.

Self-Selected Real Work Use Cases

Employees were encouraged to use the work tasks they had to complete anyway for AI upskilling. This ensured that the learning tasks corresponded to their current work tasks and did not create any additional workload. To support this decision-making process, the website provided an overview of general use cases, each accompanied by illustrative examples of work tasks that could be addressed within that category. These examples were drawn from a pre-compiled collection of work tasks. Through this structured guidance, the AI upskilling enabled employees to reflect on their own work practices and determine where generative AI could meaningfully improve their task performance.

In the next step of the learning process, employees were asked to document their prompts in the prompt library. They could either add a new prompt or record the further development of an existing one. Within the library, all prompts are assigned to a skill level based on their complexity, enabling learners to select work tasks that align with their current proficiency in using generative AI. This skillbased structure supports learners in choosing tasks they can effectively complete with AI assistance. Moreover, the documentation practice benefits colleagues, as it provides them with accessible prompt examples that can be adapted and further refined for their own use cases. Table 1 shows an excerpt from the prompt library that illustrates which real work use cases the employees selected.

Table 1: Excerpt from the prompt library which real-work use cases the employees selected.

General Use Cases	Self-Selected Real-Work Use Cases
Gather information	Project-specific weekly overview with tasks and feedback
Analyze texts	Analyze papers
	Analyze funding calls
	Analyze qualitative data
Create presentations	Create slides with reference to a publication
Generate images	Create image for project idea
	Sketch building plan
	Create image for presentation
Provide feedback and support	Support with business trip expense reports
	Improve prompting
	Practice negotiation skills
Analyze data	Prepare data
	Evaluate data

PROMPTING WORKSHOP

In addition to the website, two peer-to-peer learning sessions were organized to encourage collaborative exchange and reflection. Participants presented their selected real work use case. They had to describe the work task they had to accomplish with generative AI, as well as the challenges they had encountered in the process. Participants also indicated which tools they had used and which prompts they had developed, and reported on the insights they had gained during the process. These shared experiences sparked further discussion among participants, including considerations on whether organizational standards for AI-supported results, such as service offerings, should be established, what quality control requirements should be in place, and how existing resources such as corporate design templates could be integrated into tools such as *Microsoft Copilot*. Several participants also noted that creating presentations was particularly challenging. In addition, there was discussion about whether more meetings should be recorded in the future in order to be able to use certain features of *Microsoft Copilot*, such as creating summaries.

CONCLUSION

The AI upskilling demonstrates how employees engaged in knowledge-intensive work can learn to work with AI support. By anchoring the learning tasks in real work tasks and enabling self-selected use cases, the AI upskilling addressed key challenges identified in current research – namely, heterogeneous prior knowledge, difficulties in identifying suitable starting points for AI-supported work, and the need for continuous, adaptive learning. The combination of structured methodological guidance, embedded practice, and opportunities for peer-to-peer exchange promoted

the development of both technical and cognitive skills, including prompting and critically curating AI results. The prompt library and formats for joint reflection further supported knowledge exchange and collective upskilling. Overall, the approach to continuing education demonstrates how work and learning projects can enable situational, scalable, and sustainable skill development and equip employees with the skills necessary to use generative AI responsibly and effectively in dynamic and digitized work contexts.

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