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Coaching and inclusive lifelong learning within an AI-supported skilling system

Ileana Hamburg

IAT, Westfälische Hochschule Gelsenkirchen, Germany

Abstract: This paper first explains how skilling systems improve workers' and firms' capacity to adapt to changing labour markets by helping them develop adequate skills, measure progress, and reward practice in distinct tasks. Coaching within skilling systems supports managers and employees in improving performance, managing workplace challenges and transitions, pursuing life goals, and developing leadership skills. Lifelong learning helps employees and employers remain successful within their own job and generally in the labour market. Inclusive lifelong learning within a skilling ecosystem ensures that continuous education, upskilling, and reskilling opportunities reach all people regardless of background, age, or employment status. AI-supported skilling systems, like those described in this paper, use artificial intelligence (AI) to improve coaching and lifelong learning by delivering personalized coaching and removing traditional barriers to education. This also helps to identify skill gaps and adapt educational content. Multilingual translations and real-time language conversions using AI make training more inclusive and available to marginalized groups and those with basic skill gaps. AI-based chatbots and mentors support "learning in the flow of work," continuous coaching and mentoring. AI can identify industry trends, and upskilling or reskilling programs can align with existing needs. Inclusive skilling ecosystems, which are also described in the paper, use artificial intelligence to support learning, job training, and career growth fairly and are open to all people.

Keywords: AI-supported skilling systems, coaching, lifelong learning, inclusive skilling ecosystems

INTRODUCTION

The capacity of workers and firms to adapt to changing labour markets increasingly depends on the development of rounded skills profiles. A skilling system helps to develop skills, to measure progress, and reward practice in distinct tasks. It turns continuous effort into clear, measurable milestones. 1

Skilling is not a one-size-fits-all concept: there are diverse types of skilling, having different purposes. Some examples are reskilling, cross-skilling, upskilling, and expert skilling.

Within coaching in skilling systems, knowledge and facts can be transferred; a coach helps the person apply that knowledge or figure things out. Lifelong learning within skill development, as a continuous, voluntary pursuit of knowledge and competencies, helps to adapt to changing personal and professional demands. Inclusive lifelong learning within a skilling ecosystem assures opportunity for all people.

Artificial intelligence (AI) within skilling could help to assess gaps dynamically, personalize learning paths, automate workforce development, and support improved

coaching and lifelong learning processes. AI-supported inclusive skilling ecosystems connect education, businesses, and communities, and make continuous learning and job transitions accessible to everyone.

METHODOLOGY

The paper's methodology is based not only on a literature review that draws on academic rigor in published studies, but also on discussions with companies, authors' project experience, and industrial practice. So, the paper uses results from studies, interviews, and discussions with four representatives of European companies and coaches known from common project work. The results show that some companies already plan to use coaching within their own AI-supported skilling system; they did not do so until now, as such systems are still in the development phase. A few firms invest in supporting lifelong learning of their employees: an inclusive lifelong strategy in this context is missing, but many understand its importance. The author promised to collaborate with companies in this context having experience in the lifelong learning domain.

Skilling Systems

A skilling system, often called a skills management or talent development system, is based on a structured framework companies use to identify, develop, and follow their workforce's skills. It helps improve specific abilities through practice rather than fixed, established measures. Within a skilling ecosystem, individuals and organisations are considered to connect and interact to address skill needs and develop, use, and transmit, in an autonomous way, knowledge and abilities.1, 2, 3

A skilling system supports learning, teaching, and acquiring new abilities, as well as training for a specific job or task. In this context, the focus is on continuous practice and adaptability. Key components of a skilling system include skill identification, capturing existing skills (current state), and defining the competencies needed for the future (target state). Targeted development improves specific skills through firsthand learning, mentoring, and on-the-job learning, as well as skill tracking, i.e., continuously measuring and documenting learning progress using software or skill matrices.

The focus within such a system is on "practice" rather than "classes". Traditional training (such as rigid courses) often imparts theoretical knowledge that quickly becomes obsolete or does not translate into day-to-day work. A modern skilling system prioritizes outcome-oriented learning, where employees test and improve skills directly within real-world projects. This helps companies stay agile and respond faster to market changes. AI could be used to interconnect technologies, content, people, learning, and skilling strategies within a skilling system. 4

Coaching

Coaching is a collaborative, future-focused process where a coach guides an individual or group to find and support their potential, develop skills, and achieve specific goals. In coaching, active listening and questioning help participants discover their own solutions,

maximize their performance, and learn rather than simply telling them what to do. 8 Within companies, coaching supports managers and employees to improve performance, manage workplace challenges, transitions, follow life goals, and develop leadership skills. Coaching differs i.e., from mentoring, which relies on an expert sharing their specific advice and experience. Coaching focuses on one's own internal resources and problem-solving abilities. In comparison with training, which is instructional and a fixed set of knowledge or skills, coaching is personalized.

Within teaching, new knowledge or facts are transferred, whereas a coach facilitates the application of what the person already knows or can figure out. The five core skills of coaching are active listening, powerful questioning, goal setting, constructive feedback, and emotional intelligence (presence and empathy). Active listening focuses on the speaker and involves hearing the actual words, noticing tone changes, and observing body language to understand the whole message. Powerful questioning is based on asking open-ended questions that make the other person think and find their own answers. Goal setting in coaching is the process of collaboratively defining clear, achievable objectives to guide participants. Constructive feedback within coaching focuses on specific behaviours and growth opportunities rather than personal criticism. Emotional intelligence should create a safe environment in this context.

Lifelong Learning

Lifelong learning refers to the process of continuous learning throughout life. Today, companies are not looking for employees with only basic skills; employees must keep their knowledge up to date and be willing to learn continuously. So, lifelong learning is required to prepare employees for changes and to be successful in the labour market 9, They do not wait for new technologies to make them obsolete; they can anticipate these by acquiring skills and knowledge that keep them relevant. 10 Thus, lifelong learning becomes a tool for empowerment and job security, enabling employees both to adapt to market transformations and to be active agents of change.

Inclusive lifelong learning within a skilling ecosystem ensures that continuous education, upskilling, and reskilling opportunities reach all people regardless of background, age, or employment status. Some core pillars of inclusive lifelong learning within skilling systems are first to assure an equitable by removing financial, geographical, and social barriers so low-qualified, informal, and vulnerable workers can obtain recognized training. Flexible pathways should be created, establishing robust accreditation systems so skills learned on the job or through life experience are converted into formal qualifications. This balances technical updates—like AI and green transitions—with foundational, social, and collaborative competencies, and contributes to developing multi-actor partnerships.

AI-supported Inclusive Skilling Ecosystems

AI-supported skilling systems use artificial intelligence to improve coaching and lifelong learning. Particularly, Generative AI (GenAI) could improve a skilling system in this context by enabling personalized learning and "Human-AI" collaboration 5. This involves training staff to use GenAI systems responsibly, managing risks like misinformation, and fostering "soft skills" (such as critical thinking) that distinguish humans from machines.

In this context, some other benefits of AI are: 6, 7

- By using AI-based algorithms that analyse cognitive states and learning styles, personalized learning paths and adapted educational content could be developed.
- Multilingual translations and real-time language conversions using AI make training more inclusive and available to marginalized groups and those with basic skill gaps.
- AI-based chatbots and mentors support "learning in the flow of work," continuous coaching and mentoring.
- Using AI, industry trends could be found, skill gaps could be identified, and upskilling or reskilling programs could be oriented to needs.

Skilling ecosystems should also be inclusive, i.e., supporting public-private partnerships, ensuring flexible delivery models, including modular courses, and adaptable scheduling that accommodates adults with lower literacy, caregiving duties, or precarious work. AI-supported inclusive skilling ecosystems use artificial intelligence to make learning, job training, and career growth fair and open for all people. The development and use of AI-enabled infrastructures that translate, index, and customize digital learning content to remove language and accessibility barriers is necessary.

The support of multidimensional skills profiles development within skilling ecosystems depends critically on the use of inclusive and effective lifelong learning systems. Conceptually, such systems require strong governance, institutional coordination, adequate financing shaped as a shared responsibility, and social dialogue to develop solutions reflecting all actors' perspectives. Within many countries, there do not exist ambitious skilling systems, including cohesive lifelong learning. Adult learning is frequently treated as distinct from basic education. According to UNESCO's Global Report on Adult Learning and Education 11 data, moreover, 46% of countries allocate less than 1% of their public education budgets to adult learning. This share rises to 63% among low-income countries.

Individual-level barriers often reinforce such institutional constraints. Workers frequently report costs, time constraints, and lack of information as obstacles to learning. Such barriers are particularly pronounced among workers in vulnerable employment situations and women with care responsibilities, thereby perpetuating inequalities. At the same time, expanding access alone is insufficient if training programmes do not improve labour market outcomes. More effective programmes additionally strengthen combinations of technical, cognitive and socio-emotional skills, and incorporate complementary measures such as other active labour market policies or social protection mechanisms.

The AI-Driven Neuro-Inclusive Learning Ecosystem 12 is a project started in June 2024 and running through September 2025, focused on education and skills development in Sub-Saharan Africa. The project aims to support cognitive diversity and educational equity by integrating cognitive science with generative AI to create a personalized, inclusive learning environment. This activity should support learners with different cognitive profiles, including those with neurodevelopmental conditions such as ADHD, dyslexia, autism spectrum disorder, and other learning differences, by tailoring content delivery and assessments using AI-driven insights. Core objectives include developing adaptive learning models that respond to individual cognitive needs, and tools that promote engagement, creativity, and mastery, as well as building a digital ecosystem that is both inclusive and scalable across different education systems in the region. The project aligns with the African

Union’s goals for inclusive digital education and workforce transformation. By fostering neurodiverse talent and reducing learning barriers, it contributes to a future-ready, skills-driven generation across Sub-Saharan Africa.

The European Commission has engaged in cooperation to build an artificial intelligence ecosystem in Europe, focusing on creating an infrastructure that supports innovation, collaboration, and the development of AI technologies. 13 In this context, measures have been defined to develop the AI landscape, which connects stakeholders and supports various sectors. Some examples are the European Digital Innovation Hubs (EDIHs), 14 which support the digital transformation of SMEs, particularly AI-oriented, and Testing and Experimentation Facilities (TEFs), 15. These should provide environments for testing AI technologies.

CONCLUSIONS

The described findings indicate that technical expertise (hard skills) alone is often no longer sufficient today. Successful adaptation requires a combination of different skill sets, such as technical knowledge and digital literacy, methodological competence, problem-solving and agile project management, social and emotional skills, and personal competencies.

For companies, it means shifting away from rigid job profiles and investing in the holistic development of skills—both in recruitment and workforce development. For employees, this complex skill set serves to safeguard against job loss due to technological developments. AI-based skilling systems help to build complex skill profiles by dynamically mapping individual abilities, identifying missing knowledge, and delivering personalized, multi-disciplinary learning paths. Employees' actual work data, instead of old job titles, should be considered. Such systems compare current skills with future goals. Recent research from MIT Sloan focuses heavily on artificial intelligence trends, workplace culture, and strategic decision-making. 16 As reported by MIT Sloan, 16 this helps people and companies see where they are weak. It guides workers to pick up skills that help in their jobs as well as future ones. AI helps to create training plans for each user. AI tools help employees when they do a task, acting as coaches during work, which helps them learn new things.

Coaching can serve as a key mechanism in aiding lifelong learning. It should be supported not only through skills training, but by fostering i.e. self-direction and reflection, which are essential for cultivating a sustainable culture of skilling, including lifelong learning. Coaching and lifelong learning are crucial components of skilling for labour market policy, sustainable growth, and development strategies. However, most countries still lack adaptable AI-using skilling systems that also support coaching and inclusive lifelong learning. The inclusiveness, quality, and adaptability of these systems are important factors helping economies and societies to navigate structural transformation.

The European Commission planned to improve the use of AI and build a strong and cohesive artificial intelligence ecosystem across Europe. The AI Skills Academy 17, a flagship initiative under the Digital Europe Programme, aims to close the AI skills gap across the EU, will personalize this commitment, fostering skills and knowledge to prepare the workforce for the demands of an AI-driven future, helping Europe remain a leader in AI expertise.

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