THE FUTURE OF UPSKILLING: HUMAN- AND TECHNOLOGY-CENTERED

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ABSTRACT

The technological progress, social and value change, sustainability, and climate change are few examples for current key drivers of transformation processes to which organizations are exposed. Due to the increasing speed of these changes, many employees may no longer apply the specialist knowledge they have acquired during their vocational education throughout their entire work life. Existing knowledge must be kept up to date, and new knowledge must be acquired to be competitive in the job market of the future. Against this background, the relevance of continuing education (upskilling) in the professional environment is increasing. Therefore, our aim with this article is to reflect on the future of upskilling and how it should respond to the challenges described above. In doing so, we identify three focal fields of action: First, new technologies and emerging trends should be the starting point for upskilling activities, as they lead to both new education content as well as new didactic learning formats. Second, organizations and humans (the learning employees) should be placed at the center of future upskilling activities. Humans are individuals with different levels of knowledge and skills as well as different learning behaviors. Third, there should be a closer connection between research and the practice of upskilling to transfer scientific findings quickly and easily into new and innovative learning formats.

Keywords: competencies, continuing education, lifelong learning, upskill, technology, trends

1. INTRODUCTION

Upskilling is one of the most important key factors for organizations and their employees to maintain innovative ability and future viability [1]. The growing need is caused by emerging technologies and, accordingly, technological change [2], which requires new skills in organizations [3,4]. The number of 1.1 billion jobs is mentioned by the World Economic Forum [5] when talking about the impact of new technologies on working places. However, employees often feel inadequately prepared for the associated tasks in these areas [6], which in turn underlines the upskilling relevance.

Besides the need of upskilling and preparation of employees for the tasks in the future, organizations need to know the expected change processes to which the organization is exposed – ideally at an early stage of emerging change processes.

While it is possible for organizations to close these skill gaps with recruiting new employees, existing employees should not be disregarded: On the one hand for organizations, it is sometimes difficult to find new employees with the necessary skills (e.g., war for talent). And on the other hand, job profiles of existing employees change so that these people go into new jobs, with other skill demands. Therefore, the upskilling of existing employees is one of the few options for coping with upcoming transformation processes and requires the early development of practical and individual training programs. Consequently, identifying and teaching these future competencies is becoming a critical success factor in human resource as well as corporate development.

Due to technological change processes (e.g., through increasing digitalization) and social change processes (e.g., increasing aging of society in industrialized countries), upskill activities are subject to external influences that require continuous research into adequate measures [1]. Modern upskilling activities put the learner at the center of organizations and design human-centered training activities that need to find modern learning formats under the strong influence of technological changes.

With this paper we address these challenges and discuss implications for the future of upskilling and identify future research fields.

In Section 2 we discuss the relevance of upskilling and build the conceptual background for our paper. Section 3 follows with the upskilling in the age of digital transformation and illustrates the relevance of a trends and technology perspective for upskilling. Section 4 takes the individual learners' perspective and explains the relevance of human-centered upskilling. Section 5 connects science with practice in the context of upskilling and explains its relevance. The conclusion is part of section 6.

2. CONCEPTUAL BACKGROUND: THE RELEVANCE OF UPSKILLING

The results of the future of jobs report from the World Economic Forum [4] shows a skill change and based on this an adapted job landscape: completely new jobs are emerging, and already long existing jobs are being adjusted or decreasing in demand. This process can be attributed to different influencing drivers, such as technological progress [e.g.,2,3] or sustainability [e.g.,7]. Consequently, employees and their skills must also adapt to these new requirements to remain individual competitiveness what in sum foster competitive organizations. However, current insights

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from the Global Digital Skills Index 2022 show that, especially with new technologies on the rise, the need to catch up with digital skills remains on a high level [6]. Which in turn illustrates that we are facing a skill gap that needs to be addressed [8]. As a result, it is an important task of human resource development to provide development paths for the employees in organizations in line with the new challenges [e.g.,2,3]. One solution for this task builds on the concept of *upskilling* [8], which we define as *all actions from employees to further develop their skill set*. These training activities can be offered by the employer in the professional environment or initiated privately by the employee. Considering the changing business environment through digital transformation, there are many reasons for the relevance of employees upskilling. On the one hand, many nations face the challenge of demographic change which is also changing the employees age structure within organizations and therefore the work of human resources departments [9]. This leads to a need for upskilling the existing employees and enable them to face future tasks. On the other hand, through new generations of employees (e.g., Gen Z) we can observe a modified role of organization-employee relations [9,10], with more power on employees' side. Employees are also currently demanding more development and learning opportunities within organizations.

3. UPSKILLING IN THE AGE OF DIGITAL TRANSFORMATION

The concept of digital transformation encompasses in its conceptual background all those technologies that lead to the technology driven transformation [11]. However, different trend and technology studies show that the selection and categorization of (new and emerging) technologies are multifaceted [e.g., 1,4,11,12,13]. For example, the Tech Trend Report of the Future Today Institute [12] illustrates those overarching technologies (e.g., artificial intelligence, blockchain, metaverse) bundle different technological sub-categories with individual characteristics and application areas (e.g., avatars in metaverse, smart glasses in metaverse). Which means, that the digital transformation is also driven by a variety of characteristics from the individual technologies.

Based on this multifaced situation which is especially technology driven, the job market is also changing and shows a reaction with new and adapted requirements [4]. As a result, technology driven jobs such as data analyst, specialist for artificial intelligence, or digital transformation specialist, are growing in demand. In the context of employee skills, however, it also means that skill profiles adapt to this demand accordingly [4]. Furthermore, Mulder [2] connect the technological change also with changing interpersonal relationships and therefore with adapted collaboration between people. Which means, the digital transformation needs skills for new and technology driven forms of cooperation.

If the digital transformation is being looked at with the perspective of skills change and thus also upskilling in the business environment, various fields of action emerge: First, upskilling need a continuous monitoring of the external environment of organizations to detect signals of change as early as possible. Technological developments must therefore be identified at an early stage to prepare further upskilling for them. Second, the digital transformation is closely dependent on the technologies but also with further changes of work (e.g., culture, leadership). And therefore, these changes influence the work and relationships of organizations and their employees [2]. As a result, the consequences of technology assignment must also be considered at an early stage. Therefore, upskilling in the age of digital transformation includes more than only technologies because it also affects collaboration within the organizations and therefore soft factors. Third, by analyzing trends and technologies, it is important to bear in mind that they can have an impact at different levels [1]. On the one hand, learning content is changing and, on the other hand, new didactic formats are emerging because of the digital transformation [1,11]. We summarize these points with the following proposition:

Proposition 1. Upskilling needs a connection with trend and technology forecasting already from early stages of development.

4. HUMAN-CENTERED UPSKILLING

The previous chapter emphasized the transformation of work and the relationship of organizations to their employees through technological processes and changes [2]. This human-centered upskilling perspective is one of the cornerstones on which modern upskill activities are built.

The future competencies identified by trend analyses must ultimately be passed on to the working individual in an organization [1,11]. This means that the employees´ motivation, willingness to learn, learning success and practical application must be promoted after the appropriate skill needs have been identified and translated into suitable training [8]. However, people do not learn and work in isolation, but are part of larger organizations. Therefore, the learning individual in an organization must become the center of future research and applications to shape future competencies in the organizations. Each employee has their own unique set of skills, goals, and opportunities, and needs as a result individualized training. Diversity is one of the key success factors for companies and underlies the individuality of each employee [9]. Organizations are also increasingly exposed to the demands of younger generations and must integrate them into the corporate culture [9,10].

Furthermore, learners need to be thought of as part of an organization, as their individual goals and opportunities can be aligned with the vision of the organization and can be shaped together. Therefore, it is an important task of human resource development to show employees in organizations development paths that are compatible with the shared vision and suitable for meeting the challenges ahead [2,3].

To empower the human resources development to show the employees in organizations precisely those development paths, they first need to know about future trends and technologies that affect the organization, a corresponding skill needs assessment and, finally, modern learning opportunities [1,11]). The latter is particularly important regarding motivation, learning success and subsequent application in the organization [6,14]. Only modern learning offerings will fulfill all the criteria needed to guide the organization safely through the transformation processes [4]. Here, for example, insights from research on gamification and learning through play can help to create a learning culture in the company in which everyone can learn from everyone else in a playful and friendly way, and all these learning paths can be symbiotically brought together by technological systems in the interest of the organization [14,15].

The traditional model of upskilling has been largely focused on providing training in specific job or industry skills, often with the aim of increasing job security or improving career prospects [4]. However, there is now a growing recognition of the importance of connecting academic and practical learning to truly prepare individuals for the future. For example, instead of focusing solely on technical skills, employers are increasingly looking for employees who think critically and apply their knowledge in different contexts. As such, it is essential that upskilling initiatives incorporate both academic and practical learning. In addition, there is an increasing emphasis on the development of "soft skills" such as communication, problem-solving and collaboration. These skills are often overlooked when it comes to traditional upskilling, yet they are increasingly in demand in today's job market [4,6]. To effectively prepare individuals for the future, it is essential that upskilling initiatives incorporate both academic and practical learning. Built on this, we develop the following proposition:

Proposition 2. Upskilling should put employees at the center of its activities and develop new learning formats outbound from their needs.

5. CONNECTING ACADEMIC AND PRACTICE IN THE FUTURE OF UPSKILLING

The steps listed so far towards modern upskilling activities and applications, be it the technological trend identification and analysis, the derivation of corresponding future competencies, the subsequent competency needs assessment of existing and still needed qualifications, the transfer into suitable learning formats and finally the support of a human-centered learning culture in the organization, can only be used in a knowledge-supporting way with scientific support [1,11]. This implies a stronger cohesion between academic research and upskilling activities, which will be outlined in the following.

Learning in organizations under the influence of external factors must be carried more strongly into universities and colleges, which coincides with the expansion and maintenance of shared networks between academia and companies [16,17]. Learning formats in which employees can learn lacking skills directly from students and lecturers are to be striven for more strongly in the future. Such learning formats have at the same time the advantage that universities and colleges gain insights into the needs, fears and visions of organizations and their employees. These insights can be integrated into current research [18].

Academic upskilling activities are often essential and beneficial for students and employees. However, in many cases, these activities fail because of a lack of a coordinated process behind training offerings [16,18]. Without a proper process, the focus of research and upskilling offerings tends to be solely on the intuition and opinion of individual chairs. This leads to a lack of uniformity and consistency in the curriculum, which can create confusion and frustration for those involved [17].

Additionally, without a coordinated process, it is difficult to ensure that the upskilling activities are meeting the needs and objectives of those involved. This can lead to a lack of engagement and a feeling of being left behind by those who may not be able to access the necessary opportunities.

By creating shared networks, universities, colleges, and continuing education institutions can effectively merge organizational and business content and integrate it within their respective institutions. Shared networks are networks of universities, colleges, and continuing education institutions that collaborate and share educational resources. This type of network provides all participating institutions with access to a larger pool of educational resources, including organizational and business content, which can be integrated into their respective programs. These shared networks can be used to share best practices, strengthen relationships with industry partners, and access a greater variety of learning resources. It is about creating symbiotic effects that support a permeable flow of knowledge from academia and business [16,19]. In the medical field, for example, this type of cooperation is already common [20,21]. However, this cooperation must be promoted much more strongly in classic industrial sectors [19]. Only based on a permanent knowledge transfer between current research and current skill needs of organizations, upcoming challenges can be mastered. In summary, the following proposition is formulated:

Proposition 3. Scientific findings from upskill relevant research fields should lead directly to new learning formats to address new demands as early as possible.

6. CONCLUSION

Upskilling is an emerging trend that is changing the way companies and individuals approach training and learning. As technology advances and the job market evolves, upskilling is becoming increasingly important to stay competitive in the global economy. Organizations need to prioritize training and invest in human-centric approaches supported by technological trends to achieve the best results. By leveraging the latest technology and taking a human-centered approach, organizations can ensure their employees have the skills they need to stay ahead. For this to happen in a methodical way, it is essential that future upskilling activities are supported by scientific monitoring.

With this paper, we have made a first attempt to identify new lines of discussion for the upskilling research stream. In doing so, we have integrated various current challenges (e.g., emerging drivers, new technologies) and considered paths for the future of upskill. As a result of each path, we have summarized our results in the form of propositions.

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