(Re)skilling employees for future work: How G20 countries can use artificial intelligence-based learning technologies to workplace training

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In a rapidly changing world, the workplace is shaped by the integration of artificial intelligence (AI) into all business functions through automation and digitalization, impacting all workers, jobs, professions, and societies. As the scope of learning, workplace training demands the maximization of these new capabilities and the transition to a new frontier wherein the unique developmental needs of every worker are met through individualized training. Maximizing technology does not only require the right organizational strategy but also collective economic and societal effort for a successful transformation to a new dimension.

Challenge

In the coming decades, many role activities that have dominated the workplace in the post-industrial age will be taken over by machines. Work activities will shift toward integrated human-machine interaction and unpredictable environment impact in increased complexity in the application of expertise. Despite the emerging impact of the digital age, workplace training has not changed fundamentally. We still use systems designed for an industrial society. Furthermore, workplace I upskill employees has traditionally been designed around the behavioral and cognitive components associated with job tasks and performance standards.

The growing prevalence of AI, automation, robotics, digital transformation, and the Internet of Things is serving as a catalyst for workplace transformation, which can at times be disruptive. For example, AI is expected to become part of an im function for over 70 per cent of companies by 2030, delivering over US$13 trillion in economic output (Bluhm et al. 2018). However, AI will also result in major job losses and elimination of work due to substitution of labor. The transition of I upskill employees to digital and cognitive skills and abilities that are difficult to automate, will be critical. Therefore, it will be vital to provide effective reskilling platforms to workers in order for them to remain in the labor market.

The International Labour Organization indicates that almost half a billion people around the globe cannot find decent work (ILO 2020), leading to a number of important issues. These include lower economic growth and lack of inclusiveness work, significant deficiencies in work quality, and substantial inequalities in access to work and work quality. One of the main causes for decreasing employment is the skills gap. As a result of the rapidly changing business world and workplace existing job skills and expertise has diminished, while the need for new skills and knowledge has emerged. This has created a significant gap between the required and available talent. Furthermore, “the socio-economic impact of low labor productivity has been aggravated by declines in labor share and increases in wage inequality” (ILO 2020, 22). Therefore, the growing skills gap has far-reaching global societal impacts beyond economies and labor markets. One of the Sustainable Development Nations is to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all (Goal #8). The widening skills gap remains one of the major obstacles in achieving the United Nations 20 20 Development (UN 2015).

Innovative technologies are needed to help worker reskilling efforts, globally. Existing training approaches attempt to address gaps around critical technical skills. However, they lack the required capacity and flexibility to provide highly prescriptive and scalable workplace learning experiences. Immersive learning technologies, such as virtual reality, have already been used to simulate technical processes that are difficult to create in traditional learning environments. They also provide experiential learning opportunities. More recently, immersive learning environments, such as virtual reality (VR), augmented reality, serious gaming, and mixed reality have demonstrated capacity for technical and social skills development (Akc 2019; Daniels and Lynes 2019). Considering the fast-paced workplace changes and the need for rapid reskilling to cope with the technological advances disrupting industries, there is an emerging need to develop training simulations based on human performance augmentation and skill acquisition.

Proposal

Policy Action 1:
The Group of 20 (G20) should establish a working group (including members from the Think 20, Labour 20, and Business 20) to examine the socio-economic potential of immersive learning technologies impact at the employee, company, industry, national, and regional levels.

Such an effort should focus primarily on AI-based technological advancement, exploring significant benefits and challenges for the individual learner (employee), organization, industry, society, and world at large. The findings of the working group national and global policy decisions related to innovating and scaling up employee training.

Many workers from both developing and developed countries are facing job replacement and job extinction in a volatile, uncertain, complex, and ambiguous (VUCA) world (OECD 2018). Manual and repetitive work is rapidly being replaced by preparing workers and helping them to reskill for new jobs that would emerge from this shift will become vital to the survival of families, communities, societies, and the humanity at large.

VR technology presents new opportunities for workplace reskilling efforts through experiential, customizable, and scalable employee learning. However, most applications of VR have been limited to an organizational level in private corporates large-scale national efforts that concentrate on exploring and utilizing AI-based VR technology in technical and non-technical employee-reskilling. Furthermore, these efforts should be empirically assessed for effectiveness in terms of transf several employees. The results can provide important new insights into developing national policies for AI-based training in the digital age.

Traditionally, employees have received workplace training through employer-sponsored and professional, organization-led programs. However, such approaches will not necessarily remain viable considering the rapid work changes and the solutions for continuous employee talent development. A key challenge of developing employee talent in the digital world is finding a balance between substantive economic and logistical constraints and evidence-based outcomes of effective such as experiential learning, critical reflective thinking, and a safe learning environment with individualized feedback. Adaptive VR technology presents a unique opportunity to update and improve traditional approaches to workplace training.

Policy Action 2:
The G20 should find ways to increase awareness around the potential implications of AI-based technologies on societies.

This should focus both on the benefits of AI-based technologies, such as increasing economic efficiency and creating intelligent connectivity among workers, organizations, industries, and nations, as well as its challenges, such as forcing the crossing ethical and legal boundaries. The G20 should develop and publish standards for the ethical and legal implementation of AI. These should outline general issues, challenges, and problems associated with AI, and provide solutions for implementation of AI-based technologies across sectors, industries, and nations. This will enable the G20 member countries to safely and effectively utilize the emerging AI-based technologies, especially in reskilling employees for future work.

The initial step in responding to the changing nature of the workplace and the needs of workers is to consider the duality of the problem. The Organisation for Economic Co-operation and Development recently reported that many adults do for new jobs (OECD 2020a). Furthermore, AI will introduce widespread workplace automation and digitalization, resulting in a loss of over 75 million jobs globally by 2021, which are primarily repetitive and mundane in nature (Link 2019), and expertise will be critical for some new jobs, jobs tasks, and job functions to augment such automation and digitalization, which will create over 133 million new jobs (Link 2019). In other words, AI represented either through robots, we need human expertise and experience to augment its capabilities. Therefore, high tech and high employment do not have to be mutually exclusive (Kaneil 2019). As a result, rapid reskilling through customized and micro-learning capabilities technologies, such as adaptive VR, will address this challenge.

A potential solution that may strike this balance is the use of AI-based instructional approaches, such as adaptive VR, which utilizes decision-tree algorithms to provide a customized learning environment for each worker. Immersive, online technologies such as augmented reality games, virtual military environments, and immersive second-language learning environments are newer learning aids that have demonstrated capacity for technical and non-technical skill development (Monahan, 2008). Based on these advancements, immersive learning technologies have significant potential to serve as effective educational environments to promote all three domains of workplace learning: knowledge (cognition), attitudes (affect) and...
Policy Action 3:
The G20 should work cooperatively to provide access to emerging AI-based training technologies to workers all across industries. A global scale transformation of employee (re)skilling through AI and ensuring equal access opportunities to all. 

Adaptive VR is a technology that presents innovative approaches to learning in the workplace, both for technical and non-technical training. For technical areas, adaptive VR can expose workers to real-life situations that may pose great risks in a traditional setting. For non-technical areas, adaptive VR could provide a psychologically safe learning environment. This is vital for non-technical skills, especially interpersonal skills, such as collaboration, adaptability, and emotional intelligence (LinkedIn 2020). In addition, adaptive VR presents a rare opportunity for immediate large-scale deployment (Lee and Banerjee 2019), providing scalable solutions at the micro and macro level. 

Developmental costs of training simulations, adaptive VR also offers affordable solutions for workplace learning through head-mounted displays and cardboards, which are becoming widely available at affordable prices (Cao et al. 2019). Furthermore, government policy allocations should underpin the principle of equal and equitable access to technology for all their citizens.

Policy Action 4:
The G20 should emphasize the importance of AI-based technologies and recognize its impact on individual employees, employers, and society. It should work collectively to create repositories of AI-based simulations for worker reskilling and upskilling across all industries.

The COVID-19 pandemic has demonstrated the need for rapid reskilling and upskilling of healthcare professionals globally. AI-based adaptive VR simulations can provide immediate and cost-effective approaches for such a global crisis. G20 engagement groups should implement and coordinate a strategy forum to encourage science, research, and technology cooperation across member nations. The interests of educational institutions, workforce development agencies, national, and global healthcare bodies should be considered. A global repository of AI-based adaptive VR simulations should be created to address local, national, regional, and global crises. These platforms can be used to provide workers with information as part of their task and decision-making processes. VR and other immersive learning platforms present new capabilities and affordances to augment human cognition and learning in the context of workplace reskilling and upskilling.


Policy Action 5:
The G20 should create a new engagement group, focusing on Human Resource Development (“HRD20”) to revamp employee focus and advocate developing both human capital and employee well-being. The latest advances in technology, and increased natural disasters and pandemics, have impacted both employees and organizations. The demand for business and training solutions is rising across all industries. However, online/distance learning presents numerous challenges to both learners and educators and can exacerbate issues of access to education or social inequality. From a workplace training perspective, while most programs.

In the digital age, being mobile and having the ability to reskill and upskill throughout one’s career is a must for remaining not only competitive but also relevant in the workplace. Providing access to this technology to workers across industries is critical to rapid employee reskilling and creating a sustainable workplace learning environment. Technology has the potential to provide safe, scalable, and affordable workplace training environments to all workers. AI should be considered equally important to avoid creating a new divide among workers from developed versus developing economies, as well as minorities and underrepresented populations (OECD 2018). Therefore, government policy allocations should underpin the principle of equal and equitable access to technology for all their citizens.

While this policy brief highlights the use of AI-based VR technology, other immersive technologies, such as augmented reality, virtual reality, and mixed reality, have also been used in the workplace to augment different job tasks. These technologies have been significant in creating a smart workplace, where workers are provided with information as part of their task and decision-making processes. They also present new opportunities for team collaboration in which cross-disciplinary approaches to work are the driver of organizational productivity and firm competitiveness. VR and other immersive learning platforms present new capabilities and affordances to augment human cognition and learning in the context of workplace reskilling and upskilling.
Existing Initiatives & Analysis