

TITLE: SHAPING THE FUTURE OF WORK: AUTOMATION, AI, AND NEW TECHNOLOGIES IN EMPLOYEE TRAINING AND DEVELOPMENT

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Abstract

The influence of artificial intelligence (AI) on employee training and development is a profound game changer in the field of human resource development (HRD). The introduction of ChatGPT has not only accelerated the advancement of AI but also significantly magnified its impact on both organizations and employees. This study offers valuable insights and recommendations applicable to researchers, managers, HRD practitioners, and policymakers. Emphasizing the simultaneous development of both humans and machines is of utmost importance. A sole concentration on advancing AI technologies may carry the risk of jeopardizing the sustainability of employees' skills and their long-term career prospects.

Keywords: artificial intelligence (ai), employee training and development, human resource development (HRD), ChatGPT, impact, organizations, employees, skills, career prospects

Introduction

Artificial Intelligence (AI), an amalgam of disciplines including computer science, engineering, mathematics, psychology, and linguistics (Dwivedi et al., 2023), is rapidly transforming the business and societal landscapes (Malik et al., 2022; Hamouche, 2021). Incorporating a range of cognitive technologies from robotic process automation to complex machine learning (Yorks et al., 2020), AI's chief objective is to create machines capable of tasks that mirror human intelligence, such as visual perception, speech recognition, decision-making, and language translation (Lund et al., 2023).

The field of AI is continually evolving, consistently birthing new subdomains like machine learning, natural language processing, and robotics (Ogurlu et al., 2021). In organizational contexts, AI has become instrumental in automating routine tasks, analyzing extensive data sets more efficiently than human capability (George and George, 2023), thereby augmenting decision-making processes (Rodgers et al., 2023) and enhancing business operations (Chowdhury et al., 2023).

The advent of ChatGPT, a generative pre-trained transformer, marked a significant milestone in AI development, bridging the gap between AI capabilities and human interaction (Budhwar et al., 2022). This innovation not only highlighted the rapid progression of AI but also sparked discussions about its impact on job skills and employment. The International Labour Organization (ILO, 2023) posits that Generative AI like ChatGPT is more likely to complement jobs than to replace them. However, the demand for AI-related skills is surging, as evidenced by a Salesforce (2023) survey, which found that only a fraction of the workforce possesses these highly sought-after digital skills.

In the realm of human resource development (HRD), AI presents a significant transformative force. HRD, distinct from human resource management (HRM), concentrates on training design, delivery, and evaluation (Alagaraja, 2013), and is defined as a process aimed at developing and unleashing human expertise for performance improvement (Swanson, 1995). In contrast, HRM focuses on designing and managing human resource systems for organizational integration and employee commitment (Alagaraja, 2013). While HRM and HRD are closely related and complementary, the rise of AI necessitates a distinct exploration of its integration into HRD, especially given the evolving job and skill requirements in this era of rapid technological advancement (Budhwar et al., 2022).

Methodology

This article employs a comprehensive secondary research methodology to explore and analyze trends in training and development, particularly focusing on the implications of automation and artificial intelligence (AI). The methodology is structured as follows:

Literature Review: A systematic literature review forms the backbone of this research. This review encompasses a wide array of sources including academic journals, industry reports, white papers, and news articles. The aim is to gather relevant data and insights from established experts and organizations in the fields of automation, AI, and workforce training and development.

Data Collection and Analysis: The research involves collecting quantitative and qualitative data from secondary sources. This includes statistical information about automation's impact on the workforce, AI's role in training, and emerging trends in training methodologies. The data is analyzed to identify patterns, correlations, and potential future developments in training and development practices.

Expert Opinion and Industry Reports: To enhance the credibility and relevance of the research, the article incorporates opinions and findings from thought leaders and industry experts. Reports from prominent institutions and organizations provide a practical viewpoint and support the theoretical findings from academic literature.

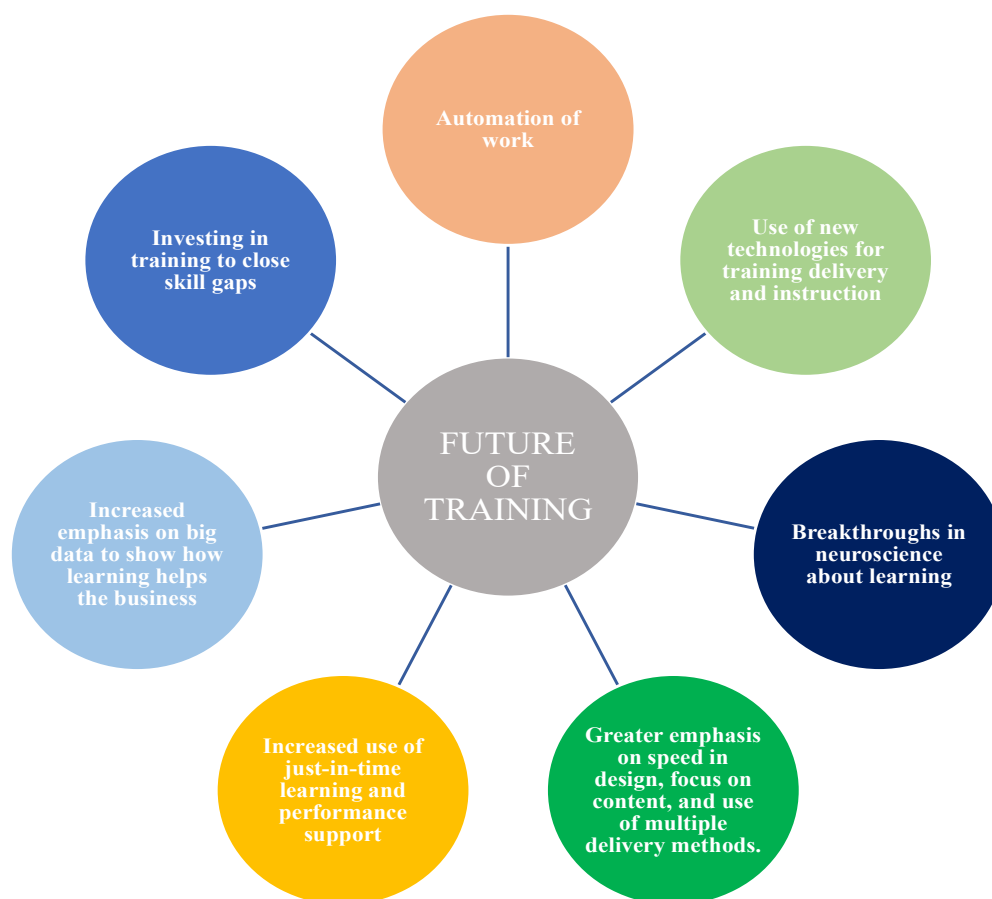
Descriptive Analytical Approach: The methodology is primarily descriptive, aiming to present a detailed snapshot of the current state and anticipated future of

training and development. It analyzes the gathered data to draw conclusions about evolving trends and their potential implications for practitioners in the field.

Results

The exploration into the future of training and development reveals several key findings essential for understanding the evolution of this field. These results integrate insights from training design and delivery, development and career management, and the role of training in social responsibility, diversity, and inclusion. Technological advances are likely to influence the future of training and development and your future as a trainer. Table 1 shows the future trends discussed in this chapter that will influence training.

Table 1: Future Trends That Will Affect Training



Automatization of Work

The use of automation to perform work previously done by employees is expected to increase quickly in the next decade. One survey found that robots and artificial intelligence (AI) are currently doing 12 percent of work but respondents report that their

use will increase to 22 percent in just the next three years (Willis Towers Watson, 2018). Over 60 percent of companies today do not use automation to complete work; rather they use it to support employees in their work by helping them to avoid mistakes and errors in performing tasks that can be automated, freeing employees' time for more important high-value work. About one-third of human resource functions have started to change their activities to prepare for increases in automation by identifying new skill requirements and matching talent to them. Twenty-five percent are planning to identify skill gaps in the future. However, 38 percent report they are unprepared to identify how to re-skill employees whose jobs are affected by automation. Table 11.2 highlights some of the potential impacts of automation on work.

Table 2: The Potential Impact of Automation on Work

<p><i>Six out of ten current occupations have more than 30 percent of work activities that can be automated using technology.</i></p>	<p><i>By 2030, 15 percent of the global workforce representing over 400 million workers could be potentially displaced by the adoption of automation. Three percent (75 million workers) of the workforce will need to change their occupation.</i></p>	<p><i>By 2030, up to one-third of the workforce in the United States and Germany and nearly 50 percent of the workforce in Japan may need to learn new skills and find jobs in new occupations (Manyika et al., 2017).</i></p>
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AI has helped the development of autonomous vehicles and robots. But depending on how robots are used, they don't necessarily eliminate jobs for humans, just change them. For some jobs, robots may be useful replacements for their human counterparts who are hard to find. For example, bricklaying contractors are unable to find enough bricklayers, but a semi-automated mason (SAM) can help perform some, though not all, of the human mason's tasks. SAM can't read blueprints, lay bricks on corners or curves, and other workers must load and refill its mortar and brick and clean up the joints on the bricks it lays. SAM helps alleviate the shortage of bricklayers, but at a cost of \$400,000 each (Bui & Kisby, 2018). Robots can also be used to perform some tasks done by employees. These include tasks that the robot can perform with equal if not more precision and consistency than humans (such as some forms of surgery), tasks that are potentially harmful to humans (e.g., painting and welding), and tasks that are simple and repetitive, enabling employees to spend their time on higher-value tasks. For example, BeeHex Inc. is building 3-D food printers that can decorate cookies or cakes. This means that pastry chefs can devote their time and energy to developing new flavors of cookies rather than spending their time icing dozens of cookies the same way. Humans still need to monitor the robots to ensure they are performing as expected, provide necessary

maintenance, and refine their skills through reprogramming. Robots can also be used to perform entire jobs (not just tasks) previously done by employees. For example, robots with highly sensitive "hands" can pick up Peeps on Just Born's production line, enabling it to speed up production; or in a store, these robots can be used to locate and deliver merchandise to online shoppers (Neumann, 2018; Hernandez, 2018). Uber Technologies has been using self-driving robot cars in some markets but recently faced a setback when a pedestrian was killed in Arizona after being struck by an autonomous vehicle that failed to avoid the collision (Bensinger & Higgins, 2018).

Jobs involving physical activities in predictable environments such as operating equipment and machinery and preparing food are likely to be automated. Also, work activities that involve collecting and processing data that occur in banking, finance, accounting, and legal work (such as preparing mortgages and computing taxes) can be done more efficiently and effectively through automation. There are several activities where automation cannot replace human performance, including jobs in which work activities are unpredictable and jobs that involve managing other people, exercising creativity, applying expertise, and engaging in social interactions (e.g., plumbers, childcare workers, artists and performers, builders, and engineers and scientists). For example, one study of Ohio employees found that almost half of their jobs are likely to be automated in the future, including cashiers, truck drivers, fast-food workers, warehouse laborers, bookkeepers, accountants, and auditing clerks (Williams & Caruso, 2018). This would result in the loss of 2.5 million jobs due to automation.

From a training and development perspective, increases in automation mean that employees will need to be provided with job retraining at the national and company level to help them gain new skills and change careers if necessary (Manyika et al., 2017). Education and training will need to address science, technology, engineering, and math (STEM) skills and skills in leadership, managing others, collaborative problem solving, social reasoning, creativity, and learning to learn. Companies will need to become even more involved in partnerships with educational institutions to provide certificate programs, apprenticeships, and on-the-job training needed for skill development. While employees are retraining, they will need some type of income and benefit support and after retraining they will need help in finding new jobs. The United States may have to consider implementing a large-scale education initiative like the GI Bill of 1944 to help employees' re-skill. The GI Bill helped World War II veterans return to civilian life by providing them with tuition payments and living expenses to attend high school, college, or vocational or technical school. Over half of veterans took the benefits, creating demand for growth of U.S. universities and making college accessible to all not, rather than just the rich or elite.

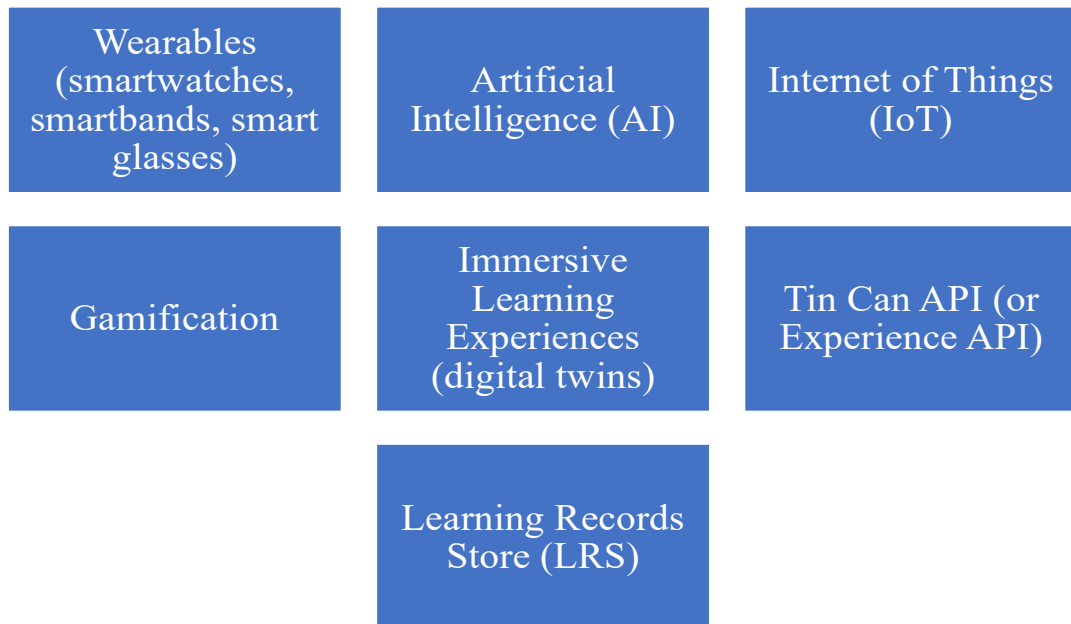
Increased use of new technologies for training delivery and instruction

The use of social media, smartphones, and other new technologies will likely increase in the future for several reasons. First, the cost of these technologies will

decrease. Second, companies can use technology to better prepare employees to serve customers and generate new business. Third, use of these new technologies can substantially reduce the training costs (e.g., travel, food, and housing) related to bringing geographically dispersed employees to one central training location. Fourth, these technologies allow trainers to build into training many of the desirable features of a learning environment (e.g., practice, feedback, reinforcement). Fifth, as companies engage in more nontraditional employment relationships (e.g., part-timers and consultants) and offer more alternative work arrangements (e.g., flexible work schedules and working from home), technology will allow training to be delivered to any place and at any time. Sixth, new technologies will make it easier for training and performance support to be accessible to learners anytime and anyplace.

Table 3 shows technological advances that will likely influence training delivery and instruction.

Table 3: New Technological Advances That Will Influence Training



Artificial intelligence (AI) will become even more humanlike and accessible at a lower cost. There are several ways AI may influence learning in the future. One way is through providing every employee with a learning bot (Dhaliwal, 2017). A learning bot helps employees by identifying and recommending the most important knowledge to get work done. Sonic Automotive is studying the use of AI for training, potentially creating a Siri- or Alexa-like application that associates will be able to ask a job-related question and get an answer without having to attend an online or instructor-led training course (Freifeld, 2018). This type of application is especially important because it will be difficult for conventional training to be rapidly deployed to meet all the knowledge and

skill needs related to the rapid changes in the automobile industry—including the introduction of autonomous driving vehicles and new types of electric cars. Learning bots can also be used by training managers to analyze matches (or mismatches) between roles and tasks and to identify learning needs.

AI will also increasingly be used for coaching and mentoring. For example, Butterfly AI's artificial intelligence coaching app uses anonymous employee feedback and current performance data to rate managers' performance and then provide advice and suggest training to improve their weaknesses (Gale, 2018). Apps are also available for employees to practice a conversation and get feedback to prepare for a face-to-face meeting. Other apps can monitor managers' speech patterns, providing them with insights into their tone, filler words used, energy level, and speed, as well as recommendations on how to improve. Wequassett Resort and Golf Club uses a learning app, "Star Coach," to help improve its customers' experience (Training Top 125, 2018). Employees respond to videos of hotel guests' complaints, questions, and compliments. The app records employees' responses and analyzes their tone, speed, and emotion. It provides a calculation of the genuineness of the response and a score of the employee's confidence level, effort to connect with, and emotional involvement with the customer. It also provides the employee with improvement tips. Coaching apps will be especially valuable as supplements to traditional face-to-face coaching and mentoring, especially in situations where because of physical distance or work schedules employees and managers don't interact very often.

There are several risks or challenges inherent with the use of AI. One of the challenges of AI is that its feedback is based on what it has been taught. This means the burden is on AI developers to teach it what right behavior looks like or what right voice tone sounds like depending on the situation, as well as how to coach for improvement. Designers of AI-based apps caution that they do not have the same complex cognitive capacity that humans do for making judgments based on simultaneously considering the quality of content shared in a coaching session, eye contact, and body language. As a result, these apps should not be considered as a replacement for human mentors and coaches. Additional challenges of AI include determining who is liable if the wrong decision is made or the wrong action is taken—the employee using AI or the developer of AI? —and protecting the privacy of employee data used to make AI more intelligent (Srail, 2018).

Internet of things (IoT) devices will become increasingly part of the workplace. Internet of things (IoT) devices refers to "smart devices," that is, physical objects embedded with sensors and Internet connections (Moore, 2017). For example, apps on wearable devices can be used to track employees' locations and connect employees to seminars, courses, or available subject-matter experts who are in close geographic proximity to them. IoT helps make learning a continuous ongoing personalized experience that employees can engage in when it is needed. There is no need to wait for a formally scheduled class to learn!

The use of games and mobile learning is likely to increase as companies seek to make training fun, maximize the learning experience, and appeal to millennials' and other learners' expectations that learning should be quick, include short interactive lessons, be available at their fingertips, and allow them to ask their peers questions, share experiences, and seek advice (Castellano, 2015; Ford & Meyer, 2014; Bersin, 2015). The gamification experience might include advanced simulations based on digital twins, a digital representation of a real-world object or system that learners can explore in a three-dimensional environment (Gartner, 2017; Wright, 2018).

Conclusions

Several significant conclusions can be derived from the discussion surrounding the influence of artificial intelligence (AI) on training and development, as well as its wider implications for the workforce and human resource development (HRD). Below are the key takeaways:

AI's Transformative Role in Learning: Artificial intelligence is playing a transformative role in the realm of training and development. Its applications span personalized learning, recommendation systems, coaching, and mentoring. Learning bots and coaching apps driven by AI are reshaping the way employees acquire knowledge and skills.

Workplace Automation Redefining Roles: The growing integration of automation and AI within workplaces is redefining job roles and tasks. While it is expected to automate repetitive and routine functions, it also offers new opportunities. This automation is poised to impact a wide range of industries, necessitating a focus on reskilling, and upskilling the workforce to adapt to these changes.

Embracing New Training Technologies: Organizations are increasingly embracing emerging technologies for training delivery and instruction. This includes wearables, smart devices, gamification, and immersive learning experiences. These technologies are making training more flexible, accessible, and engaging for employees.

AI's Influence on HRD Practices: The field of HRD is undergoing significant shifts due to AI's influence. HRD professionals need to adapt to these technological advancements and incorporate AI into their training programs. AI can assist in identifying skill gaps, providing real-time feedback, and enhancing the overall training experience.

Growing Demand for AI-Related Skills: The demand for AI-related skills is on the rise across diverse industries. However, a substantial portion of the workforce lacks these digital competencies. Organizations must invest in training and development initiatives to bridge these skill gaps and ensure that employees can effectively collaborate with AI technologies.

Ethical and Privacy Considerations: Utilizing AI in training and development raises ethical and privacy concerns. AI's recommendations are based on the data it has been trained on, prompting questions about the ethical responsibility of AI developers.

Additionally, safeguarding the privacy of employee data used for AI training is paramount.

Collaboration with Educational Institutions: Companies are forging partnerships with educational institutions to offer certificate programs, apprenticeships, and on-the-job training. These collaborations are essential to equip the workforce with the skills required for the evolving job landscape.

Emphasis on Continuous Learning: Given the evolving nature of work and the integration of AI, continuous learning and adaptability have become imperative for employees. Beyond technical skills, employees need to develop soft skills such as leadership, problem-solving, and creativity.

Diverse Impact on Job Roles: The impact of automation and AI on job roles varies. While some jobs may be automated, others may undergo significant transformations, and entirely new roles may emerge. HRD professionals must prepare employees for changing job requirements and potential career transitions.

In summary, artificial intelligence is a catalyst for change in training and development, reshaping the learning process and organizational dynamics. To thrive in an AI-driven era, organizations must invest in reskilling and upskilling their workforce, leverage innovative training technologies, and address ethical considerations. HRD professionals play a pivotal role in navigating these changes and ensuring that employees remain adaptable and equipped with the skills needed for the future of

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