Revolutionizing HRD through Digitalization

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Abstract

Technology and its applications have had a significant impact on human resource development (HRD), and they will continue to do so at an ever increasing speed. We used narrative literature review, along with our a priori opinions and experiences and ChatGPT, to identify some of the areas in which these impacts have been and will be greatest. Areas identified through these methods, all influenced by artificial intelligence, are described; they include authoring, performance management and coaching, personalization and continuous learning, analytic metrics, robotic continuous improvement, employee engagement and autonomy, employee wellbeing and life balance, attrition reduction, simulations, digital dialogues, communities of practice, credentialing, soft skills development, and ethics. Given the extensive impact on HRD, practitioners must be ahead of the wave of change. Further, academic programs must assess their curriculum and modify it so graduates of their programs will be well prepared to meet the demands of the marketplace.

Keywords: HRD, digitalization, AI, automation, transformation, curriculum

Revolutionizing HRD through Digitalization

A revolution is heating up in human resource development (HRD). Technology, in various forms, has always interacted with HRD and its many functions, just as it has influenced the world of business generally. More and more attention has been directed at digitalization in HRD driven primarily by the rapid developments in artificial intelligence (AI) and machine learning. Artificial intelligence (AI) describes technologies that let computers mimic human functions like learning, adapting, interacting, reasoning, and optimizing (Chedrawi & Haddad, 2022). Using a narrative literature review, we first explored how digitalization, the application of technology to automate and optimize HRD processes, and AI have impacted, are impacting, and are likely to impact HRD. Second, we reflected on the role of HRD curriculum and its potential to develop HRD professionals as leaders in this transformation.

Impact of Technology on HRD

To meet the first objective of this narrative literature review, we explored the following keywords: digitalization, machine intelligence, and artificial intelligence, all in conjunction with HRD. We searched specifically within each of the fourteen topics that we had identified a priori, based on our experiences, with the assistance of ChatGPT in identifying themes we overlooked.

Authoring

Especially in repetitive tasks, such as developing job descriptions, onboarding and training materials, and goal setting, among others, AI is proving to be effective and efficient and is likely to become more so. For example, as Silva and Costa (2023) identified, ChatGPT, one of many AI authoring tools, can be applied to generate documents, such as internal communication

forms, performance reports, employment and services contracts, and termination letters. It can also execute natural language processing tasks, such as text summaries, translations, and text creation. Another use of ChatGPT could be to mechanize repetitive tasks (it can be set up to perform tasks like virtual interviews, generation of performance reports, or categorization and analysis of resumes) (Silva & Costa, 2023). Additionally, it can provide accurate and up-to-date information (it can be trained to answer frequently asked questions about policies, benefits, and so on), and increase efficiency (it can improve the recruitment, performance feedback, and training materials, requiring companies to spend less time).

In addition to ChatGPT, other specific tools have been used to save time for HRD practitioners, such as Cajon, an end-to-end capability-aware neural tool that generates job descriptions automatically with less involvement from humans (Qin et al., 2022). Substantial trials using real hiring data show that Cajon can be used to produce comprehensible and successful job descriptions. Specifically, Baidu software has implemented the Cajon framework as one of its talent acquisition tools (Qin et al., 2022).

Another tool that enables fast and automated tasks, such as job coding, is OPERAS, an adaptable decision-support tool (Langezaal et al., 2023). OPERAS has been shown to secure a high degree of accuracy in occupational classification and exposure assessment of job descriptions, significantly reducing the workload of HR practitioners. It performs noticeably better than other coding tools and expert coders (Langezaal et al., 2023).

The advances in these tools enable HRD professionals to allocate more of their valuable time to the strategic components of their work rather than administrative tasks. In this process,

automation transforms the operational aspects of HRD and fosters a culture of continual improvement (Agarwal et al., 2023).

Performance Management and Coaching

Two-way communication tools can provide instant feedback on performance, allowing supervisors to coach employees at the moment of need. Digital systems can improve the determination of whether performance lies in the system or within individual employees for continuous improvement. Digitalization can provide data to assist in succession planning and determining when employee acquisition is needed. Metrics are also useful in talent management, helping to identify high-performance workers, workforce adjustments, and so on.

Performance Management

A recent review (Gelinas et al., 2022) identified that the literature on AI and its application in performance management could be divided into two main categories: literature that focuses on the benefits of the use of AI in performance management and literature that addresses the use of AI in tracking the performance of employees (Gelinas et al., 2022).

In the first category, studies have analyzed the use of AI in the performance management planning process to review past employee performance and also pertinent data from other sources to set key performance indicators (KPIs), if this is seen as desirable (we have major reservations about the value of KPIs). AI has also been used to monitor these indicators providing managers and staff with instant, current, and reliable feedback (Jia et al., 2018). Another example of this category is the work of Rozman et al. (2022), who integrated artificial intelligence into a talent management model to increase the work engagement and performance of the organizations. The model encompassed various facets of artificial intelligence integration

within the organization's HR management (HRM) activities focused on talent management, particularly in the areas of talent acquisition and retention, suitable employee training and development, organizational culture, leadership, reducing employee workloads, employee engagement, and organizational performance. The findings showed promising results supporting the use of AI in all of these processes, while having a positive impact on the enterprise's performance and employee engagement.

The second category (the application of AI in employee monitoring) is an essential part of assessing employee performance. An example of this application is a study by Huang et al. (2021) that applied AI to enterprise knowledge management performance evaluation. They analyzed the relationship between knowledge management performance evaluation and the balanced scorecard metrics and built an index system in two levels to evaluate together enterprise practices and relevant literature to build a balanced scorecard-knowledge management performance evaluation. They developed an Analytic Hierarchy Process-Fuzzy Comprehensive Evaluation (AHP-FCE) method to assess knowledge management performance and offer a quantitative evaluation method for knowledge management performance evaluation.

A recent review by Ekuma (2023) on the use of AI and automation in HRD concluded that, overall, the research indicates that performance management is being revolutionized by the use of automation and AI to offer continuous, data-driven feedback and evaluation. Solutions powered by automation and AI can assess employee performance data, identify areas for improvement, and offer customized development recommendations (Huang & Rust, 2021).

Coaching

Coaching has been defined as a coach and client structured one-on-one discussion with the goal of developing and supporting long-term transformations for the individual and possibly other stakeholders (Bachkirova et al., 2014). Coaching and mentoring are often confused; however, they have different goals. While mentoring is about long-term career development, coaching is about improving performance, believing in the potential of the person being coached and working towards that person's performance development. Mentors are experts in the specific field in which they are mentoring, and mentees are less experienced professionals. Coaches, on the other hand, believe in the full potential of their clients to perform at a high level and are experts in the art of asking powerful and transformative questions that help their clients reflect, learn, make performance changes, and transform their behaviors in the process. Coaching and mentoring will probably always need human intervention, as these transformations are mediated by the human connection between coaches or mentors and their clients, and many of those connections have a huge emotional component. We argue that, while robots and AI developments cannot substitute for the power of humans, human connections, emotions, and associated body responses involved in these processes, they can probably aid in some areas, such as providing feedback on, and assisting in improving, performance. They can also help with certain tasks of the coaching and mentoring processes and make access to those programs more affordable.

In this line, Teblanche and colleagues (2022; 2023) studied the use of AI-mediated coaching, testing its effectiveness and reflecting on its use to bring coaching closer to professionals in a more affordable way. In their first study, they investigated the efficacy of Vici, an AI chatbot coach (Teblanche et al., 2022). They designed a randomized control trial study and

showed that goal achievement increased in the treatment group significantly; however, the differences in the other variables measured (resilience, psychological wellness, and perceived stress) were non-significant. This is an example of AI coaching working well in a specific application (goal attainment) and, as the authors argued, it has the potential to democratize coaching in a scalable and affordable way. However, given that they did not find differences in other variables, we still need human involvement to have an influence in other areas.

In a second study, they continued comparing the effectiveness of AI-mediated coaching and human coaching alone (Teblanche et al., 2023). They compared two equivalent longitudinal RCTs in which participants had received coaching for ten months and, again, assessed increases in the clients` goal attainment. While one study used human coaches, the other used an AI chatbot coach. Both approaches to coaching appeared to be effective in helping their clients achieve their goals. The authors argued that AI coaching could replace human coaches who use too simplistic approaches. Additionally, it could increase the demand of more specialized human coaches and could be used to democratize coaching. However, Teblanche et al. (2023) argued that empathy, emotional intelligence, and other human traits are still unique to humans, and AI is not able to match them yet. They highlighted the contribution of this study by showing that AI coaching can perform well in specific areas, such as goal setting. These tools, when applied specifically and rooted in well-studied theories (such as goal theory) might have the potential to democratize coaching and bring it to a much larger audience.

Another example of the use of AI in coaching with good results is the study by Blyler and Seligman (2023). They showed that coaches and therapists could use ChatGPT for their treatments, as it proposed different treatments and solutions based on different narrative

identities for clients. The authors argued that AI can create customized methods based on an individual`s narrative identity, and that could benefit their clients by developing their wellbeing and awareness. We see the potential of this use and believe that the tool can be used by certified professionals that are able to make informed decisions to get ideas and work more effectively. These studies showed evidence of the effectiveness of AI tools in specific functions of the coaching process. However, the use of AI in coaching is controversial with others being more critical; they have analyzed the goods and the bads of the applications of these tools in organizations. For example, Bridgeman and Giraldez-Hayes (2023) reflected on the benefits and disadvantages of using AI-enhanced tools in coaching sessions (through video review software). They analyzed interviews with fifteen coaches who used AI-enhanced techniques. The coaches thought about the sessions and used recordings and AI-generated data. Within the benefits, coaches who focused on skills development using AI made specific changes to their practice, giving them insights that drove deeper reflection and self-awareness and helped them gain confidence. Within the disadvantages, the coaches sensed that the software did not understand subtle meanings, feelings, and contexts of conversations, which are fundamental to the progress of the clients. They also found that coaches were nervous about the use of these technologies and their potential to analyze their performance.

Another example of a critical reflection of the application of AI in coaching is Graßmann and Schermuly (2021), who reflected on the suitability and potential of using AI developments in coaching practices. On one hand, they questioned the technology`s capabilities to establish cooperative relationships and guide the clients through the coaching procedures. The authors argued that the major challenges that could jeopardize the effectives of AI coaching is in

providing personalized feedback and identifying the problems of the clients. On the other hand, they argued that, in most cases, AI seems to help the clients through many of the coaching process. They agreed with Teblanche and colleagues (2023) and stated that AI coaching will probably change the coaching industry and offer a future HRD tool due to its lower costs and larger target groups. The debate is open today, and more research will be needed to continue testing these tools in the performance management and coaching fields to get a better sense of the areas in which HR can benefit from AI in these arenas and the areas that impose more risks for clients and organizations.

While we encourage the use and see the potential of using AI tools in the coaching and mentoring fields, we believe this should be done with specific functions, such as providing ideas for future actions or aiding with goal setting and goal attainment. However, we do not support the exchange of human interaction for just human-machine interaction as machines, AI, and robots are not there yet (if they will ever be). Professionals are humans, and human learning is mediated by emotion and body responses associated with it; therefore, if we want professionals to engage in powerful transformations and excellent performance, we cannot leave those variables out of the game.

Personalization and Continuous Learning

No longer is it necessary to develop and deliver mass training. By tracking individual performance digitally, employees can receive training that is individually customized, allowing for continuous learning in response to rapid developments in the workplace. The same is true for any application in which individualization is helpful.

AI tools can be used within HRD to personalize not only the training, but also the needs analysis, knowledge management, and results feedback processes (Chen, 2023). By individualizing training, the effectiveness of the training and the potential to increase transfer and the results derived from it increase as well.

Tapalova and Zhiyenbayeva (2022) proposed a framework to implement AI holistically in education. They addressed the use of machine learning, intelligent mentors, personalized educational systems, chatbots, social networking sites, expert systems, and virtual environments in the educational context. They argued that creating personalized learning pathways generated great advantages, such as the possibility of accessing training 24/7, the chance to adapt the contents of the training to personal needs and learning styles, and the opportunity for participants to receive real-time and frequent feedback. This framework has the advantage of having a global view and could be applied, with some adaptations, to the context of HRD.

But what, specifically, are the tools that can be used for personalization? Due to the high speed of developments, it is difficult to keep up with their discovery and evaluation. But with the aim of providing a couple of examples, we will identify some of them in the following paragraphs.

The AI-assisted personalized feedback system (AI-PFS) (Xu et al., 2023) was designed based on a series of questions to students and provides individualized and reliable feedback for each class based on learning analytics modules.

Another example is the Supervised Machine Learning (ML) techniques to identify students' preferences, needs, and backgrounds, scheduling individualized assignments (Fernandes et al., 2023). These techniques can be used to create a system that is trained based on

academic factors, such as preferences for the assignments, proficiency, preference for remote vs. in-person training, interest level, and so son, and prescribes an individualized learning plan with the goal of maximizing the grade and satisfaction of the student.

The development and test of Supervised Machine Learning (ML) techniques and the different ML models that they can use (for examples, Logistic Regression, K-Nearest Neighbours, Support Vector Machine, Decision Tree or Random Forest) are still in progress. In the study by Fernandes et al. (2023), the Random Forest classifier was the most effective. However, the high-speed and constant development of new techniques makes it difficult to keep up and makes evidence-based decisions difficult. In spite of this, these types of tools have the potential to be used for training design purposes to implement training and generate activities for participants, ensuring relevance to their jobs, maximizing content relevant and thorough for training transfer (González-Ortiz-de-Zárate et al., 2021). HRD professionals should keep themselves updated in the new developments in the field and the possibilities that they offer.

Analytic Metrics

Many factors in addition to performance can be tracked digitally. Though connoting big brother, with subsequent invasion of privacy, such metrics can support a remote workforce, determine time on task and screen time, interaction time with colleagues and clients, time on training, wait times for client call-ins to improve staffing and robotic applications, and so on. Analyses of these metrics can provide insights not available previously.

Artificial intelligence (and other techniques, such as machine learning) are expanding the application of HR Analytics or people analytics. Organizations increasingly depend on algorithm-based prediction tools for HR-related decision making (Cho et al., 2023).

However, it is difficult to determine the borders between AI and HR Analytics, as their roles are interconnected. While HR analytics is considered a main component of AI (Sharma, 2021), AI is supposed to support smart people analytics (Arora et al., 2021). Arora et al. (2021) conducted a literature review on the combined use of HR analytics and artificial intelligence in the context of the HR function and argued that, when analytics are integrated with AI systems, they provide high quality deliveries for various HR functions. They arrived at the conclusion that analytics and AI are now the driving forces in HR and conceive that the two tools are deeply connected. On one hand, HR analytics uses big data analytics to deliver precise predictions and in-depth insights. On the other hand, analytics can be seen as a prerequisite for AI's success (for AI to be successful, it needs to be fed with huge amounts of valuable data). AI together with analytics can be applied in most HR functions, such as talent acquisition, training and development, engagement and performance appraisal, or retention, and organizations can enhance their productivity using the combined tools.

The areas of application of the combined techniques are growing. In health and safety, an advanced area in the use of these techniques, we see evidence of the successful application of some of these tools. As an example, Selin et al. (2019) presented a study analyzing the use of AI, data analytics, and gamification to emergency exit planning. They compared various options for emergency exit, estimated the movement capabilities of the general population and special risk groups, and searched for the key areas for customer evacuation.

Today, we hear the promise (Silva & Costa, 2023) that organizations who use this combined technology for HR will spend less time and money on tedious administrative tasks and will free their agendas for the big decisions that have the larger impact, maximizing earning and

outliving their competitors. Maybe moved by that promise, we have started to see reports on AI misconduct which have triggered public awareness calling for a more sustainable and responsible usage of AI (Chang & Ke, 2023). We should probably continue experimenting with the uses of the combined tools, expand the areas of application, and make a responsible and sustainable use of them.

Robotic Continuous Improvement

We are all familiar with the applications of robots in manufacturing and customer service (Singh et al., 2022). With digitalization, those systems can be improved automatically based on feedback loops.

Robotics are built from the developments of electronics, artificial intelligence, nanotechnology, machine learning, and so on, and they can be seen as the art of building machines that can replicate human behaviors and movements (Vrontis et al., 2022). The technology that involves robotics has advanced at a high speed in past years, accelerating the adoption of robots in the workplace.

Recent literature is mostly optimistic about the learning and training opportunities that the emergence of these technologies brings for professionals and organizations (Kim, 2022; Raj & Seamans, 2019); however, there is a real concern about the implications that embracing these technologies will have on work and employment. Some authors have pointed out that research should focus on three areas: learning opportunities, human-robot collaboration, and job replacement (Vrontis et al., 2022).

Within learning opportunities derived from the adoption of robots in the workplace, professionals will go through a learning curve. Robots can eliminate repetitive and routine tasks

previously performed by humans. This offers the possibility for employees to engage in new functions, use their skills more effectively, develop new skills, and be exposed to learning opportunities (Vrontis et al., 2022). Professionals with these learning opportunities will need to go through significant training to perform their new functions and work with and use robots in their everyday work activities.

When studying how to implement effective human-robot collaboration or human-robot interaction (HRI), we should take into consideration three areas (Kim, 2022): human capabilities, which include attitudes towards robots, technology readiness, and communication with robots; collaboration configuration, which includes human-robot team building, leading multiple robots, and systemwide collaboration; and attributes related to contact, which includes safety interventions and ethical issues.

With regards to the job replacement concern, an increasing number of predictions have been made that we are about to see a significant replacement of jobs by automation, robots, and AI. While ordinary jobs that do not demand much creativity or humanity will vanish, others will be altered from the core (Schwab, 2016). Individuals might feel overwhelmed and may feel differently (perhaps optimistic, pessimistic, or skeptical) about the developments and their implications in the job market. How they feel appears to vary based on their perceived values and demographic profiles and occupations (Nam, 2019).

Researchers and practitioners seem to be fascinated by the idea of robots surpassing human performance. However, some voices suggest that we should focus on other issues that are central to our everyday interaction with technology, moving from the concept of replacing humans to the issue of how well humans will interact with robots and technology (Dégallier-

Rochat et al., 2022). While some encounters tend to be mechanized, others tend to empower humans. We should prioritize the second to coexist and grow with the technological advancements.

Duggan et al. (2022) conducted a qualitative study with a large number of gig workers who relied on technology platforms to perform their jobs. They found that the algorithmic management function used by platform organisations acts as a new, seemingly unmovable boundary to competency development. Specifically, this function serves to severely constrain the potential of individuals to develop. (p. 4494)

Based on the above studies, we will need to continue exploring the nuances of machine-human interaction.

Employee Engagement and Autonomy

Digitalization and the resulting metrics allow employees to do their work with less human supervision. This autonomy allows employees to be more creative and more engaged in their work.

We found several studies analyzing the relation between the use of AI tools and employee engagement, and the relation seems to be positive. For example, Rozman et al. (2022) found that AI positively influenced employee engagement (among several functions of HRD); and Dutta et al. (2023) found an increase in employee engagement (and employee voice) using artificial intelligence-enabled chatbots. Apparently, the use of these tools in different aspects of the HRD function and the employee cycle can make the processes more productive, reduce the workload and enhance employee engagement (Saxena & Mishra, 2023).

Besides the positive influence of the use of AI applications on employee engagement, the role of leadership in the equation seems to be key. Apparently, leaders should leverage AI tools to foster skilled and engaged workers (Rozman et al., 2023) because it seems that, for the use of AI tools to increase employee engagement, leaders should embrace their use and act as a catalysator in the organization, as change leadership seems to moderate the influence of AI on employee engagement (Wijayati et al., 2022).

Employee Wellbeing and Life Balance

When appropriately applied, employees in many jobs can choose their own work and break times. Further, accessing the benefits of digitalization may allow employees to be more efficient and effective, allowing for less stress and time on the job. Apps are also available to encourage employees to have better mental health.

We found literature showing examples of the application of the new technology in wellbeing management.

A first example is what has been called technology enabled nudges used for improving the physical wellbeing of the employees (tracking steps, daily exercise and water intake, sleep patterns and so on). Apparently, employees felt comfortable with them, showing potential to keep the employees accountable and monitor their progress (Dutta & Mishra, 2023).

In addition to that some computer programs have been used to enhance the psychological well-being of the employees (Avey et al.,2023). And specific chatbots have been used to enable mental well-being in the organizations (Dutta & Mishra, 2023).

Apparently, in most cases, health and mental wellbeing in the organizations is still managed by humans. However, technology can be used to manage those programs together with

humans (or humans can use technology to automate some of the areas managed). In some scenarios, a chatbot that include sentiment analysis can be used to identify cases were employees might need support; then, the case can be moved forward by human intervention (Dutta & Mishra, 2023). This technology opens the door for the combined work of humans and technology to manage health and mental well-being.

Other examples include the use of emotional recognition technology for a variety of purposes, including the increase of the wellbeing (Spataro 2020), the use of emotional AI as tool to combat stress-related work absences, or the use of affect recognition tools to automate management in the organizations (Mantello & Ho, 2023).

In spite of the potential we see in these applications, we should remark the difficulties that might arise with their implementation, such as the requirement for the workforce to upskill and reskill. With the fast pace of the technological developments, we will soon encounter a great skill mismatch that can impact employee's well-being. Although organizations are nowadays committed to develop digital skills, the reality is that they are not properly developed and much more should be done in this domain (Cramarenco et al., 2023).

Attrition Reduction

Involuntary turnover (not in the interests of the organization), especially of talented employees as they find opportunities in other organizations or sectors, can be a major problem for an organization, especially in the tight job markets that many communities are currently experiencing.

Not only is it difficult to find qualified candidates, but once they are hired, they need to be trained and acculturated, using both financial and time resources of the organization.

Prediction models can be created using AI to identify causes of attrition and behaviors associated with attrition. AI allows such models to include external factors that might influence attrition (Diaz & Salvador, 2023). Interventions can be applied using AI when attrition behavior is identified. AI's ability to provide feedback can also help improve supervisor/management coaching when behaviors associated with attrition are identified. Systems within the organization can also be modified based on the prediction models, including such things as affirming various flexibility approaches to the job, including off-site work; compensation and benefits packages; work processes, improving work conditions, and so on. David (2023) cited a survey that found that the main reason that 63% of employees changed jobs because of a lack of advancement opportunities. This challenges an organization to find ways to meet this desire; not an easy task. But the application of AI can help in identifying on an individual level what might meet this need for such employees. AI can provide insights that might suggest a special project, a transfer to another location or another position, or a team assignment might meet individual needs.

Simulations

Training is most effective when the training environment matches the work environment. However, in high-risk situations (such as the military) or when expensive products are consumed, simulations can be the answer. Tools such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) can overcome these challenges. And, given the ability to create a work environment virtually, the chances are that transfer will be maximized when the skills learned have to be implemented.

Digital Dialogues

Digital dialogues are not new. In fact, we often use it today, either through our phones or computers. In this context, however, we are talking about a person interfacing with a digital device. Presently, this is at a mostly elementary stage, such as phone calls designed to answer questions. As this function develops, as we are currently seeing with the use of ChatGPT, more and more complex conversations will be available, perhaps even developing to provide counseling in employee assistance programs (EAP), career development sessions, conflict management, employee assessment of organizational culture, and so on. It is even probable that digital device to digital device interaction will become common. Think about an empty training room with a computer up front and digital devices where the trainees would usually sit, exchanging dialogue among the devices. While this seems outlandish, it could happen.

Communities of Practice

Digital platforms allow employees to have more dynamic interactions for purposes of collaboration to share knowledge, innovate, problem solve, build teams, and so on.

Credentialing

Through the application of technology, such as block chaining, employee skills can be tracked and verified, allowing organizations to provide employees with certification or credentials confirming their competence. We have already reached the point when employees being interviewed for a position in a new company or in another part of their existing company are required to produce evidence of their competence as displayed in their current position, thus streamlining the recruiting and selection process by reducing the time and cost involved.

Quora (n.d.) explained that AI can enhance credentialing with "automated data extraction and verification, credentialing decision support, continuous monitoring and compliance management, predictive analytics for risk assessment, streamlined provider onboarding, interoperability and data integration, and enhanced fraud detection and prevention" (p. 1).

Soft Skills Development

As digitalization increasingly takes over routine tasks, it will become increasingly necessary for employees to develop emotional, cultural, and spiritual intelligence; innovation and creativity; and critical thinking. These are competencies that digitalization is not likely to develop for a long time, if ever. Thus, HRD will need to focus more effort on development in these areas (Dolev & Itzkovich, 2020). As they observed, "soft skills are key at the workplace and are non-cognitive skills and abilities that computers lack, that allow people to collaborate with machines and complex systems. They include the ability to constantly adjust to change and manage increasing stress levels, demonstrate empathy and moral judgement, build relationships and be creative and innovative". (p. 55)

Ethics

The continuing development of digitalization will require more attention to its ethical application. This will require attention to transparency, equal access to the benefits of digitalization, attention to copyrights, accuracy of metrics, and so on.

Most ethical malfeasances occur when humans abrogate their responsibilities to check on the outcomes from such processes. While celebrating the opportunities that AI provides to HR, Hunkenschroer & Luetge (2022) also highlighted the risks identified in their review of more than 50 articles based on the relationship between AI and HR, including humans foregoing their

obligations to ensure ethical application of AI. The fear, of course, with all applications of AI will outrun the ability of humans to control AI, thus losing control over what AI can and will do, in spite of the best efforts of humans. Given that AI-created documents are meta-analyses of what exists on the web, and humans cannot determine whether copyrights are violated or the sources of information, plagiarism, inadvertently, can easily be committed.

David (2023) cautioned that AI can unintentionally perpetuate biases and stereotypes present in historical data. To accomplish this, AI systems should comply with the five pillars of responsible AI: explainability and interpretability; bias mitigation and fairness algorithms; data robustness and granularity; data quality and rights; and accountability through regular audits and monitoring of the AI's decision-making process. Is the solution transparent? Can you easily explain how its algorithms work? What bias mitigation is in place? What client onboarding experience can be expected and what training is included? Major risks exist if these questions aren't asked and answered appropriately.

The Future of Digitalization within HRD

All of these applications will persist and continue to develop, perhaps even to the point where society will need to redefine work and our economy. Many decades ago, two bold and futuristic thinkers anticipated the future that we may be encountering based on the impact of technology. Skinner (1948), for example, envisioned a society in which work is defined as being anything that people enjoy doing, not their contribution to productivity. Buckminster Fuller, well known for his contributions across many fields and many decades, challenged our economic model. As quoted in an interview with Barlow (1970), Fuller said that the idea that everybody must make money is absurd. He held that it is a fact that just one in 10,000 people can create a

technological disruption that can support all the others. Today, we come up with new jobs because of the delusion that, based in Malthusian Darwinism, everyone has to work to justify their existence. They recommend to people to go back to school and to do whatever they were thinking before someone told them they have to make money.Who among us will have the courage, professionally and politically, to suggest such societal changes, though digitalization may well make such changes mandatory? Who will tell the emperor (i.e., HRD) that we have no clothes? Is HRD on the way to becoming TD – not talent development, but technology development?

Responses to Digitalization within HRD Curricula

Second, we reflected on how HRD curriculum must change, and quickly, in order to meet the challenges of digitalization to continue to develop HRD professionals as leaders during this transformation. Since launching his professional career, McLean (1967) found that higher education was already lagging behind industry in technology. Since then, studies of both undergraduate and graduate education (in the U.S.) have shown little interest in the technological competencies required of HRD professionals (Gaudet & Vincent, 1993; Kuchinke, 2002; Lim & Rager, 2018), except for those programs situated in departments associated with technology. Where will higher education fit into this transformation? The lag has been significant, and HRD programs may continue to rely on industry to develop such competencies among HRD graduates who are ill-prepared in the area of digitalization.

What will it take for this transformation of curricula to be successful? First, existing faculty members may require significant in-service development so they can be competent in the areas of digitalization. This will not be easy as many current HRD faculty are tenured and would

need to undergo this development voluntarily. There will also be significant costs involved that, presumably, would need to be covered by universities. Who is prepared to offer such in-service education? What incentives can be offered to faculty to undergo such in-service education? When could it be offered when many faculty teach during the summer as well as during the year?

Second, faculty recruitment would need to focus on selecting faculty who already have these competencies. But how will this be possible when most faculty applicants come from programs that do not have such a focus? And doctoral students in HRD do not typically have an appropriate undergraduate or master's degree major to support such competence. And those students who have the desired background may find themselves recruited into industry offering far more lucrative livelihoods than is available in academia, keeping the pool of available recruits limited.

Third, the curriculum itself would need to change. Given how invasive digitalization is becoming in HRD, every course is going to have to be modified to reflect this digitalization. Who among our current faculty are currently competent to make such modifications? And there will likely be a need for at least a couple of courses focused on digitalization (and especially the application of AI). HRD curricula are already overloaded with courses. What courses will be merged or even eliminated to make room for the new courses?

Fourth, there are potential turf issues within universities. Other programs are already teaching courses in AI and digitalization. Can HRD programs make the case for the subject-specific application of their proposed new courses? And, if they are unsuccessful, how can an HRD program be offered that is relevant to today's workplace environment?

Fifth, there will be a need for an industry-based advisory group to work with the faculty in creating a transfer-rich HRD curriculum. Do our programs have significant connection with industry to put together a committed group of industry experts willing to give of their time and expertise in helping create HRD curricula? Will industry connections assist faculty in placing students (and even faculty) in obtaining internships in which they can develop their digitalization skills even further?

Transforming HRD curricula to meet the needs of our students is going to be a very difficult task. We've made transitions in the past, however, some of which have been significant (given the roots of many HRD programs), and with the appropriate commitment, this transition can be made as well.

Conclusions

We drew conclusions on the impact of AI in HRD, on possible transformations of the HRD function based on developments of AI, and on the role of AI and its place in HRD curriculum to develop HRD professionals and leaders.

Limitations and Future Research

The study presents the limitations implied by the use of the narrative literature review as the method, with a language limitation of studies published in English and Spanish.

References

Agarwal, S., Gupta, A., & Roshani, P. (2023). Redefining HRM with artificial intelligence and machine learning. In *The adoption and effect of artificial intelligence on human resources management, Part A* (pp. 1-13). Emerald. https://doi.org/10.1108/978-1-80382-027-920231001

Arora, M., Prakash, A., Mittal, A., & Singh, S. (2021, December). HR analytics and artificial intelligence-transforming human resource management. In *2021 International Conference on Decision Aid Sciences and Application (DASA)* (pp. 288-293). IEEE.

Avey, J., Newman, A., & Herbert, K. (2023). Fostering employees' resilience and psychological wellbeing through an app-based resilience intervention. *Personnel Psychology, 52*(9), 2229-2244, doi: 10.1108/PR-08-2021-0612.

Bachkirova, T., Cox, E., & Clutterbuck, D. (2014). Introduction. In: Cox, E., Bachkirova, T., Clutterbuck, D. (Eds.). *The Complete handbook of coaching* (pp. 1–20). Sage.

Bales, R. A., & Stone, K. V. W. (2020). The invisible web at work: Artificial intelligence and electronic surveillance in the workplace. *Berkeley Journal of Employment & Labor Law, 41*(1), 1-62.

Barlow, E. (1970, March 30). The New York Magazine teach in. *New York Magazine*, 24-30. https://click.endnote.com/viewer?doi=10.1080%2F17439760.2023.2257642&token=WzI1Njg4OTMsIjEwLjEwODAvMTc0Mzk3NjAuMjAyMy4yMjU3NjQyIl0.KPO7mTWZ3Ikr8zzaaZ18grBikh8

Blyler, A. P., & Seligman, M. E. (2023). AI assistance for coaches and therapists. *The Journal of Positive Psychology, 1*-13. https://doi.org/10.1080/17439760.2023.2257642

Bridgeman, J., & Giraldez-Hayes, A. (2023). Using artificial intelligence-enhanced video feedback for reflective practice in coach development: benefits and potential drawbacks. *Coaching: An International Journal of Theory, Research and Practice, 1*-18. https://doi.org/10.1080/17521882.2023.2228416

Burke, L. A., & Hutchins, H. M. (2008). A study of best practices in training transfer and proposed model of transfer. *Human Resource Development Quarterly, 19*(2), 107-128. https://doi.org/10.1002/hrdq.1230

Chang, Y. L., & Ke, J. (2023). Socially responsible artificial intelligence empowered people analytics: A novel framework towards sustainability. *Human Resource Development Review, 0*(0), 1-33. https://doi.org/10.1177/1534484323120093

Chedrawi, C., & Haddad, G. (2022). The rise of quasi-humans in AI fueled organizations, an ultimate socio-materiality approach to the lens of Michel Serres. *Pacific Asia Journal of the Association for Information Systems, 14*(2), 2. DOI: 10.17705/1pais.14202

Chen, Z. (2023). Artificial intelligence-virtual trainer: Innovative didactics aimed at personalized training needs. *Journal of the Knowledge Economy, 14*(2), 2007-2025. DOI: 10.1007/s13132-022-00985-0

Cho, W., Choi, S., & Choi, H. (2023). Human Resources Analytics for Public Personnel Management: Concepts, Cases, and Caveats. *Administrative Sciences, 13*(2), 41. https://doi.org/10.3390/admsci13020041

Cramarenco, R. E., Burcă-Voicu, M. I., & Dabija, D. C. (2023). The impact of artificial intelligence (AI) on employees' skills and well-being in global labor markets: A systematic review. *Oeconomia Copernicana, 14*(3), 731-767. https://doi.org/10.24136/oc.2023.022

David, S. (2023). AI's role in revolutionizing talent acquisition and retention. *Forbes*. https://www.forbes.com/sites/forbeshumanresourcescouncil/2023/08/01/ais-role-in-revolutionizing-talent-acquisition-and-retention/?sh=45d4b6fd24e8

Dégallier-Rochat, S., Kurpicz-Briki, M., Endrissat, N., & Yatsenko, O. (2022). Human augmentation, not replacement: A research agenda for AI and robotics in the industry. *Frontiers in Robotics and AI*, *9*, 270. https://doi.org/10.3389/frobt.2022.997386

Diaz, G. M., & Salvador, J. L. G. (2023). Analyzing employee attrition using explainable AI for strategic HR decision-making. *Mahematics*, *11*(22). https://doi.org/10.3390/math11224677

Dolev, N., & Itzkovich, Y. (2020). In the AI era, soft skills are the new hard skills. In W. Amam & A. Stachowicz-Stanusch (Eds.). *Artificial intelligence and its impact on business* (pp. 55-77.) Information Age.

Duggan, J., Sherman, U., Carbery, R., & McDonnell, A. (2022). Boundaryless careers and algorithmic constraints in the gig economy. *The International Journal of Human Resource Management*, 33(22), 4468-4498. 10.1080/09585192.2021.1953565

Dutta, D., & Mishra, S. K. (2023). Bots for mental health: the boundaries of human and technology agencies for enabling mental well-being within organizations. *Personnel Review* (ahead-of-print). https://doi.org/10.1108/PR-11-2022-0832

Dutta, D., Mishra, S. K., & Tyagi, D. (2023). Augmented employee voice and employee engagement using artificial intelligence-enabled chatbots: a field study. *The International Journal of Human Resource Management*, *34*(12), 2451-2480. https://doi.org/10.1080/09585192.2022.2085525

Ekuma, K. (2023). Artificial intelligence and automation in human resource development: A systematic review. *Human Resource Development Review* (online first). https://doi.org/10.1177/15344843231224009

Fernandes, C. W., Rafatirad, S., & Sayadi, H. (2023, June). Advancing personalized and adaptive learning experience in education with artificial intelligence. In *2023 32nd Annual Conference of the European Association for Education in Electrical and Information Engineering* (EAEEIE) (pp. 1-6). IEEE.

Gaudet C., & Vincent A. (1993). Characteristics of training and human resource development degree programs in the United States. *The Delta Pi Epsilon Journal*, *35*, 138–160.

Gélinas, D., Sadreddin, A., & Vahidov, R. (2022). Artificial intelligence in human resources management: a review and research agenda. *Pacific Asia Journal of the Association for Information Systems, 14*(6), 1. DOI: 10.17705/1pais.14601

González Ortiz de Zárate, A., Alonso García, M. A., Berrocal Berrocal, F., Quesada-Pallarès, C. & McLean, G. (2021). Evaluation of a predicting transfer model in Spain through Structural Equation Models. In *28th International Research Conference in the Americas (AHRD).* Academy of Human Resource Development, 35.

Graßmann, C., & Schermuly, C. C. (2021). Coaching with artificial intelligence: concepts and capabilities. *Human Resource Development Review*, *20*(1), 106-126. https://doi.org/10.1177/15344843209828

Haan, E., & Nilsson, V. O. (2022). Coaching at Scale: Investigating the Efficacy of Artificial Intelligence Coaching. *International Journal of Evidence-Based Coaching & Mentoring, 20*(2), 20–36. https://doi.org/10.24384/5cgf-ab69

Huang, Z., He, J., & Ren, X. (2021). Application of artificial intelligence in enterprise knowledge management performance evaluation. *Knowledge Management Research & Practice*, 1-9. https://doi.org/10.1080/14778238.2020.1850187

Hunkenschroer, A. L., & Luetge, C. (2022). Ethics of AI-enabled recruitment and selection: A review and research agenda. *Journal of Business Ethics, 178*, 977-1007.

Jia, Q., Guo, Y., Li, R., Li, Y., & Chen, Y. (2018). A conceptual artificial intelligence application framework in human resource management. *Proceedings of the International Conference on Electronic Business, Guilin, China*. https://aisel.aisnet.org/iceb2018/91

Kim, S. (2022). Working with robots: human resource development considerations in human–robot interaction. *Human Resource Development Review, 21*(1), 48-74. https://doi.org/10.1177/15344843211068810

Kuchinke, K. P. (2002). Institutional and curricular characteristics of leading graduate HRD programs in the United States. *Human Resource Development Quarterly*, *13*(2), 127-144. https://doi.org/10.1002/hrdq.1019

Langezaal, M. A., van den Broek, E. L., Peters, S., Goldberg, M., Rey, G., Friesen, M. C. & Vermeulen, R. C. (2023). Artificial intelligence exceeds humans in epidemiological job coding. *Communications medicine, 3*(1), 160. https://doi.org/10.1038/s43856-023-00397-4

Lim, D. H., & Rager, K. (2015). Perceived importance of curricular content of Graduate HRD programs in the U.S. *New Horizons in Adult Education and Human Resource Development, 27*(2), pp? https://doi.org/10.1002/nha3.20099

Mantello, P., & Ho, M. T. (2023). Emotional AI and the future of wellbeing in the post-pandemic workplace. *AI & society*, *1*-7. https://doi.org/10.1007/s00146-023-01639-8

McLean, G. N. (1967, April). Labor union response to technological change. *SABE Data Processor*, *1*, 4-6.

Meister, J. C., & Willyerd, K. (2021). *The 2020 workplace: How innovative companies attract, develop, and keep tomorrow's employees today*. HarperCollins.

Nam, T. (2019). Citizen attitudes about job replacement by robotic automation. *Futures*, 109, 39-49. https://doi.org/10.1016/j.futures.2019.04.005

Qin, C., Yao, K., Zhu, H., Xu, T., Shen, D., Chen, E., & Xiong, H. (2022). Towards automatic job description generation with capability-aware neural networks. *IEEE Transactions on Knowledge and Data Engineering*, *35*(5), 5341-5355. doi: 10.1109/TKDE.2022.3145396

Quora. (n.d.). https://www.quora.com/How-can-AI-enhance-the-credentialing-process-in-healthcare

Raj, M., & Seamans, R. (2019). Primer on artificial intelligence and robotics. *Journal of Organization Design*, *8*(11), 1-14. https://doi.org/10.1186/s41469-019-0050-0

Rožman, M., Oreški, D., & Tominc, P. (2022). Integrating artificial intelligence into a talent management model to increase the work engagement and performance of enterprises. *Frontiers in Psychology*, *13*, 1014434. https://doi.org/10.3389/fpsyg.2022.1014434

Rožman, M., Tominc, P., & Milfelner, B. (2023). Maximizing employee engagement through artificial intelligent organizational culture in the context of leadership and training of employees: Testing linear and non-linear relationships. *Cogent Business & Management, 10*(2), 2248732. https://doi.org/10.1080/23311975.2023.2248732Saxena, M., & Mishra, D. K. (2023). Artificial intelligence: the way ahead for employee engagement in corporate India. Global Knowledge, Memory and Communication (ahead of print). https://doi.org/10.1108/GKMC-09-2022-0215

Schwab, K., & Sala-i-Martín, X. (2016, April). *The global competitiveness report 2013–2014: Full data edition*. World Economic Forum. http://hdl.handle.net/11146/223

Selin, J., Letonsaari, M., & Rossi, M. (2019). Emergency exit planning and simulation environment using gamification, artificial intelligence and data analytics. *Procedia Computer Science, 156*, 283-291. https://doi.org/10.1016/j.procs.2019.08.204

Sharma, G. (2021, November). A literature review on application of Artificial Intelligence in Human Resource Management and its practices in current organizational scenario. In *2021 Fifth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 594-600). IEEE.

Singh, G., Banga, V. K., & Yingthawornsuk, T. (2022, October). Artificial Intelligence and Industrial Robot. In *2022 16th International Conference on Signal-Image Technology & Internet-Based Systems* (SITIS) (pp. 622-625). IEEE.

Silva, M., & Costa, D. (2023, July). Chat GPT and Human Resource Management. In *Conferência-Investigação e Intervenção em Recursos Humanos* (No. 11). https://doi.org/10.26537/iirh.vi11.5274

Skinner, B. F. (1948). *Walden two*. Macmillan.

Spataro, J. (2020). *The future of work—the good, the challenging & the unknown*. Microsoft. https:// www. micro soft. com/en- us/ micro soft- 365/ blog/ 2020/ 07/ 08/ future- work- good- challenging- unkno wn.

Tapalova, O., & Zhiyenbayeva, N. (2022). Artificial Intelligence in Education: AIEd for Personalised Learning Pathways. *Electronic Journal of e-Learning, 20*(5), 639-653. https://doi.org/10.34190/ejel.20.5.2597

Terblanche, N., Molyn, J., de Haan, E., & Nilsson, V. O. (2022). Comparing artificial intelligence and human coaching goal attainment efficacy. *Plos one, 17*(6), e0270255. https://doi.org/10.1371/journal.pone.0270255

Terblanche, N., Molyn, J., Williams, K., & Maritz, J. (2023). Performance matters: Students' perceptions of Artificial Intelligence Coach adoption factors. *Coaching: An International Journal of Theory, Research and Practice, 16*(1), 100-114. https://doi.org/10.1080/17521882.2022.2094278

Vrontis, D., Christofi, M., Pereira, V., Tarba, S., Makrides, A., & Trichina, E. (2022). Artificial intelligence, robotics, advanced technologies and human resource management: a systematic review. *The International Journal of Human Resource Management, 33*(6), 1237-1266. https://doi.org/10.1080/09585192.2020.1871398

Wijayati, D. T., Rahman, Z., Rahman, M. F. W., Arifah, I. D. C., & Kautsar, A. (2022). A study of artificial intelligence on employee performance and work engagement: the moderating role of change leadership. *International Journal of Manpower, 43*(2), 486-512. https://doi.org/10.1108/IJM-07-2021-0423

Xu, W., Meng, J., Raja, S. K. S., Priya, M. P., & Kiruthiga Devi, M. (2023). Artificial intelligence in constructing personalized and accurate feedback systems for students. *International Journal of Modeling, Simulation, and Scientific Computing, 14*(01), 2341001. https://doi.org/10.1142/s1793962323410015