Review-Articles

Théau's articles

Article :"What Will the Education of the Future Look Like? How Have Metaverse and Extended Reality Affected Higher Education Systems?"

The article "What Will the Education of the Future Look Like? How Have Metaverse and Extended Reality Affected Higher Education Systems?" explores the impact of Extended Reality (XR), including the metaverse, on higher education. It highlights XR's potential to revolutionize education by making learning immersive and accessible, especially in STEM and medical fields. The article emphasizes the importance of visuospatial skills in these areas and how XR can help develop them.

Article :"From Industry 4.0 Towards Industry 5.0: A Review and Analysis of Paradigm Shift for People, Organization, and Technology"

The article "From Industry 4.0 Towards Industry 5.0: A Review and Analysis of Paradigm Shift for People, Organization, and Technology" examines the transition from Industry 4.0 to Industry 5.0, emphasizing the importance of people, organization, and technology. The focus shifts from sustainability in Industry 4.0 to a human-centric approach in Industry 5.0. The article highlights the need to adapt technology for human workers and emphasizes the crucial role of lifelong learning.

Article :"Building Resilience for Surviving and Thriving in a VUCA Context" proposes an "hourglass"

The article "Building Resilience for Surviving and Thriving in a VUCA Context" proposes an "hourglass" model for developing resilience in multinational enterprises (MNEs) within a VUCA (volatility, uncertainty, complexity, and ambiguity) context. The model underscores the importance of resourcefulness, time interpretation, and entrepreneurial judgment. The article highlights the need for leaders to accumulate resources, interpret temporal signals, and make sound decisions to handle adversity and thrive.

Article :"VUCA and Resilience in Engineering Education: A Comparative Study of Four Approaches"

The article "VUCA and Resilience in Engineering Education: A Comparative Study of Four Approaches" examines how higher education programs can prepare future engineers for a VUCA environment by integrating training on resilience and uncertainty management. It presents four case studies across different program levels and underscores the importance of a holistic and progressive approach to developing these skills. The article highlights the

need to expose students to VUCA situations and provide tools to handle them early in their education.

Article :"Strategies for Developing Soft Skills Among Higher Engineering Courses"

The article "Strategies for Developing Soft Skills Among Higher Engineering Courses" explores how higher education institutions integrate soft skills development into their engineering programs. It emphasizes the growing importance of these skills for engineers' professional success, beyond technical skills. The article analyzes practices in four Portuguese institutions and highlights the challenges and opportunities related to embedding soft skills into curricula.

Article :Analysis of Essential Skills for Future Industry Leaders

Based on the provided sources, several essential skills can be identified for future industry leaders who must navigate a world that is continuously evolving, technology-driven, and uncertain. The first critical competency is adaptability and resilience. In a VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) environment, leaders must be capable of making swift decisions and adjusting their strategies to meet changing conditions. Resilience plays a vital role, as leaders need the capacity to absorb external disruptions, recover from setbacks, and turn failures into valuable learning experiences.

Technological and digital skills are also crucial for future leaders. They must stay informed about emerging technologies such as extended reality (XR) and the metaverse, understanding their potential to transform industries. Moreover, the ability to integrate Industry 4.0 and 5.0 technologies—including artificial intelligence (AI), the Internet of Things (IoT), and collaborative robotics—is vital for maintaining a competitive edge and promoting sustainability within their organizations.

A human-centered approach to leadership is another key factor. Industry 5.0 shifts the focus towards enhancing the human element in technology-driven environments. Future leaders should prioritize the well-being, continuous training, and skill development of their employees. Emotional intelligence is particularly important, as it enables leaders to understand and manage emotions, communicate effectively, and build strong, cohesive teams that can perform at a high level.

Soft skills remain indispensable for successful leadership. Effective communication is essential for conveying ideas clearly, persuading stakeholders, and influencing outcomes. Additionally, leaders must excel in teamwork and collaboration, creating inclusive and cooperative environments where diverse teams can work together efficiently. Critical thinking and problem-solving are equally important, as they allow leaders to analyze complex situations, identify key challenges, and develop innovative solutions. Encouraging creativity and fostering a culture of innovation are necessary for adapting to the rapid changes and new challenges that industries face today.

Finally, a commitment to sustainability is increasingly becoming a fundamental leadership trait. Future leaders must integrate sustainability principles into their decision-making

processes, considering the social, environmental, and economic impacts of their actions. By promoting practices such as the circular economy and responsible production, leaders can contribute to the long-term resilience and sustainability of their organizations and the wider community.

In conclusion, the future of leadership requires a balanced combination of adaptability, technological expertise, emotional intelligence, effective communication, and a strong commitment to sustainability. These skills will enable leaders to thrive in a dynamic and complex world while driving innovation, fostering collaboration, and promoting sustainable growth.

Navigating the VUCA World: Skills Gaps in the Modern Workplace

In today's rapidly evolving landscape, characterized by volatility, uncertainty, complexity, and ambiguity (often referred to as VUCA), leaders face unprecedented challenges in guiding their teams and organizations. The VUCA environment demands that leaders possess not only technical expertise but also a range of soft skills to navigate the intricacies of their operational context. As organizations strive to adapt, it becomes essential to understand the current state of workplace skills, the existing gaps, and the requirements for future success.

State of the Workplace

Research indicates that organizations are currently grappling with significant skills shortages, with a staggering 82 percent of employers reporting a skills gap. This gap manifests across various domains, particularly in critical-thinking and problem-solving skills (65 percent), managerial and supervisory skills (55 percent), and communication and interpersonal skills (53 percent). The ATD Research report highlights that the COVID-19 pandemic and widespread retirements have exacerbated these deficiencies, leading to a knowledge loss that hampers innovation and growth.

Furthermore, a recent survey revealed that nearly 40 percent of leaders believe the skills gap at their company has worsened over the last year. This sentiment is echoed by 70 percent of corporate leaders, who identify a critical skills gap negatively impacting business performance. The need for strategic and critical thinking is paramount, as organizations seek individuals capable of making informed decisions amid uncertainty. Communication, too, is increasingly recognized as a top priority, with 46 percent of leadership citing it as one of the three most necessary skills.

Bridging the Gaps

To thrive in a VUCA world, organizations must prioritize the development of key skills that are increasingly essential for success. In addition to technical expertise, the focus must shift toward cultivating soft skills, such as agility, collaboration, and emotional intelligence. Leaders should create environments that empower their teams, fostering a sense of purpose and direction. This includes ensuring that team members understand not only the organization's goals but also the external factors influencing their work.

Investing in training and development initiatives will be critical in bridging these skills gaps. Organizations should also encourage a culture of continuous learning, where employees feel supported in their growth and development. As Deloitte emphasizes, cognitive skills like problem-solving and creative thinking are becoming vital as the pace of change accelerates.

In conclusion, navigating the complexities of a VUCA world requires a multifaceted approach to workforce development. By addressing current skills gaps and fostering an agile, purpose-driven culture, organizations can equip their leaders and teams to thrive in an unpredictable environment, driving innovation and ensuring long-term success.

Théau's sources:

About VUCA world:

https://hbr.org/2023/09/how-to-be-a-better-leader-amid-volatility-uncertainty-complexity-and-ambiguity
Discussion about what skills and capabilities do in-house leaders need to navigate their teams through this 'VUCA' environment.
 10min-26min importance of soft skills-importance of purpose - Agility-
« Create a team who know where there are going »-28 min- identify risk-be able to have a voice— how can I support my team to support the business , focus on the purpose and take into account the environment, how to motivate the team , To understand the business (problem)
56 '' poll
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What are skills gaps and why do they matter?

https://gloat.com/blog/what-are-skills-gaps/?utm_source=google&utm_medium=cpc&utm_campaign=20213054298&utm_content=150547194638&utm_term=&utm_term=&utm_campaign=20213054298&utm_source=google&utm_medium=cpc&hsa_acc=5703324441&hsa_cam=20213054298&hsa_grp=150547194638&hsa_ad=660409231151&hsa_src=g&hsa_tgt=dsa-1483970072796&hsa_kw=&hsa_mt=&hsa_net=adwords&hsa_ver=3&gad_source=1&gbraid=0AAAAABebzPweDcM08M-F1cep4tiKAQChJ&gclid=EAIaIQobChMI2YSCkra0iQMVTDoGAB0t3DoZEAMYASAAEgIBJ_D_BwE

State of the workplace (point of view of employers):

https://www.td.org/atd-blog/skills-gap-is-top-of-mind-for-employers
ATD Research report, Bridging the Skills Gap: Workforce Development in Changing Times: « Organizations continue to face critical skills shortages, according to new research from ATD. Currently, 82 percent of employers report a skills gap. »
https://www.td.org/atd-blog/skills-gap-is-top-of-mind-for-employers
« What specific areas are employers seeing skills gaps in? Participants are presently experiencing several skills gaps: A majority indicated gaps in critical-thinking and problem-solving skills (65 percent), managerial and supervisory skills (55 percent), and communication and interpersonal skills (53 percent). According to the research, some causes of the skills gap are education and work-preparation systems not keeping up with organizations' needs, the COVID-19 pandemic (which had a particularly large impact on healthcare), and record numbers of retirements, resulting in knowledge loss. »
https://www.springboard.com/blog/business/skills-gap-trends-2024/

Springboard for Business's The State of the Workforce Skills Gap 2024:

« Skills gaps aren't just widening, they're worsening. » « Nearly 40% of leaders say that the skills gap at their company has worsened in the last year. »
The survey was conducted by Centiment in December 2023 and included 510 organizational leaders with the title of Director and above (referred to as "leaders" or "leadership" here), and 521 junior-level employees with the title of Manager or below (referred to as "junior employees").

The vast majority of U.S. companies are underskilled, according to company leaders. 70% of corporate leaders report a critical skills gap in their organization – one that's having a negative impact on business performance.

« Large companies are operating with an under-skilled workforce. More than a third of leaders are reporting limited innovation and growth as a result. »

strategic/critical thinking is the top soft skill needed in their workforce today, with the related skill of problem-solving and decision-making coming in second. Communication is also lacking: 46% of leadership say this is a top 3 needed skill.

According to Deloitte, organizations are struggling to find the technical talent they need to drive innovation-focused initiatives.

It's not just technical skills that are increasingly in demand. Cognitive skills like problem-solving and creative thinking are actually growing in importance most quickly. As the pace of change accelerates, businesses need to remain agile. Few could have predicted today's complex landscape of work; the way we'll be working even a year from now is equally unpredictable.

State of the workplace (post of view of employees) :

state-of-the-global-workplace-2024-download.pdf or
https://www.gallup.com/workplace/645608/state-of-the-global-workplace-2024-report.aspx

Bridging Current and Future Skills Gaps:

https://www.td.org/content/atd-blog/bridging-current-and-future-skills-gaps

Aymane's articles

Article :"The Workforce Revolution: Reimagining Work, Workers, and Workplaces for the Future"

This article examines the profound transformation of work driven by technological advancements (e.g., generative AI, virtual reality), global crises (e.g., COVID-19, geopolitical conflicts), and evolving societal expectations (e.g., CSR, inclusion, sustainability). It explores how roles, workplaces, and workforce behaviors are being reshaped by automation and hybrid methods. Organizations are called to adopt responsible leadership and innovative HR strategies to navigate these challenges. The issue emphasizes the need to bridge gaps between employee expectations and organizational performance while fostering a human-centric work culture. Key areas include automation's integration, leadership evolution, and workforce adaptability in an increasingly complex future.

Article :"Exploring Leadership Effectiveness of Engineers at a Company in the Sugar Industry in South Africa"

This study investigates the leadership capabilities of engineers at a South African sugar company, where their role as a bridge between management and the workforce is critical yet undervalued. Operating under economic pressures (e.g., cost-cutting due to prolonged drought), engineers face challenges in motivating teams with limited resources. Through qualitative research and interviews, the study identifies gaps in leadership recognition and effectiveness, offering recommendations to enhance collaboration, strategic thinking, and inspiration within teams. It highlights the importance of empowering engineers to meet organizational goals and improve employee morale in resource-constrained environments.

Article :"Developing Human Capabilities for Supply Chains: An Industry 5.0 Perspective"

This paper focuses on the skills needed for supply chain management in the Industry 5.0 era, emphasizing the synergy between humans and robots. Using AHP and DEMATEL methodologies, it prioritizes critical competencies: managerial skills (e.g., negotiation, strategic thinking), operational skills (e.g., planning, logistics), and advanced technical skills (e.g., AI, robotics, real-time tracking). The study highlights the need for workforce flexibility and adaptability to address digital transformation challenges. Recommendations include fostering sustainable practices and equipping professionals with the tools to integrate technology while maintaining human creativity and problem-solving in supply chain operations.

Article :"Factors That May Impact Curriculum Design in Higher Education in a VUCA World"

This article examines how higher education curricula can be designed to remain resilient and adaptive in a volatile, uncertain, complex, and ambiguous (VUCA) world. Based on a survey of 37 educators from six countries, it identifies curriculum components most sensitive to VUCA events, such as teaching methods, interpersonal skill development, and course content. The study highlights the potential impacts of artificial intelligence, cyberattacks, online disinformation, and climate change on education. It recommends that educational systems adopt agile and inclusive approaches, integrate innovation, and focus on lifelong learning to prepare students for complex global challenges.

Conclusion of Aymane's articles:

The collection of articles delves into the transformative challenges and opportunities in work, education, and supply chain management within a rapidly evolving, technology-driven world. Each domain is experiencing significant pressures and uncertainties, demanding innovative and adaptive solutions to navigate volatile, uncertain, complex, and ambiguous (VUCA) environments.

The workforce is undergoing profound change as technological advancements like AI and virtual reality redefine the nature of work, workplaces, and workforce behaviors. These shifts, combined with global crises and evolving societal expectations, require organizations to embrace responsible leadership and human-centered strategies. Automation, hybrid work models, and priorities such as sustainability and work-life balance are becoming integral to the future of work.

Leadership in engineering plays a crucial role in driving organizational success, particularly in resource-constrained industries. Engineers often serve as vital links between management and the workforce, yet their leadership roles are frequently undervalued. Empowering engineers with enhanced collaboration skills, strategic thinking, and leadership recognition can improve employee morale and operational efficiency, addressing the challenges of limited resources and high-pressure environments.

The supply chain sector is transforming under the principles of Industry 5.0, which focuses on harmonizing human creativity with robotic efficiency. As digital transformation accelerates, supply chain professionals must cultivate a blend of managerial, operational, and technical skills to adapt to advanced technologies. This evolution emphasizes sustainability, adaptability, and the seamless integration of human and machine capabilities to create resilient and efficient systems.

In higher education, curriculum design must evolve to prepare students for an increasingly complex and unpredictable global landscape. Educational institutions need to prioritize agility and resilience in their programs, focusing on interdisciplinary learning, digital literacy, and lifelong education. With the rise of AI, cyber risks, and climate change, higher education must equip students with the skills to address multifaceted global challenges while fostering innovation and inclusivity.

Across all these domains, a common thread emerges: the necessity for leadership and human-centric approaches to adapt to technological and societal disruptions. Building resilient systems, fostering innovation, and equipping individuals with forward-thinking, interdisciplinary skills are essential for thriving in this era of rapid transformation. Together, these insights underline the urgency of proactive adaptation and collaboration to create sustainable and inclusive futures.

Ambroise's articles:

Article: "Glob Bus Org Exc - 2023 - Lim - The workforce revolution Reimagining work workers and workplaces for the future"

Work is evolving rapidly due to technology, competition, demographic shifts, societal expectations, and global crises. The "Workforce Revolution" reimagines work, workers, and workplaces to adapt to these changes.

Technology like AI and virtual reality is transforming work, while global crises and societal demands for responsibility and inclusion are reshaping environments. Past work was manual and rigid; today, technology enhances efficiency and diversity. The future emphasizes automation, creativity, empathy, and virtual workspaces.

Reports highlight that automation will transform rather than eliminate jobs, requiring continuous learning and human-centric strategies. Leaders must foster sustainability, adaptability, and support positive workplace behaviors. HR must evolve to integrate technology and value-driven approaches.

Article: "industrial 4.0"

The Industrial Revolution 4.0 is completely transforming education. It emphasizes the need for students to develop critical thinking, creativity, communication, and technological skills. Indonesia's "Merdeka Belajar" (Independent Learning) curriculum seeks to address these needs with a flexible, innovative approach.

The Industrial Revolution 4.0 makes technological changes very fast. It requires education to integrate digital tools and foster adaptability. The Merdeka Belajar curriculum is implemented in some high schools. It emphasizes independent learning, project-based activities, and creativity to prepare students for this shift.

While 68% of respondents find the curriculum effective, citing its promotion of exploration and innovation, challenges remain. These include limited educator training, insufficient facilities, and the need for better resources and support. Solutions focus on improved infrastructure, educator guidance, and gradual implementation.

Article: "CDIO2024-factorscurriculumdesign"

This document shows how Higher Educational Institutions (HEIs) can design curricula that fit to Volatility, Uncertainty, Complexity, and Ambiguity (VUCA). It focuses on identifying sensitive curriculum components and anticipating VUCA events that could disrupt education.

The study, involving 37 faculty members from six countries, developed a harmonized curriculum model with nine components, including goals, teaching methods, and assessment strategies. Teaching methods, the location of learning, interpersonal skills, and assessments were found to be highly sensitive to VUCA events like AI, online disinformation, and climate change.

AI emerged as a critical factor, likely to transform teaching, learning, and assessment processes. Yet, there are far more other potential disruptions such as cyberattacks, political

instability, and environmental disasters. HEIs must focus on resilience by adapting teaching methods, integrating technology, and prioritizing interpersonal skills development.

Article: "The complexity of leadership competence in universities in the 21st century"

This document examines the role of leadership competence at ABC University, aiming for excellence by 2047. It highlights challenges faced by the university's leadership, particularly the rector and vice-rectors, in managing operations and fostering collaboration.

The study adopts a constructivist paradigm with qualitative research methods, using a case study approach focused on ABC University. Data were gathered through interviews and observations with key university figures, analyzed using a thematic inductive approach.

Leadership at ABC University is marked by integrity and expertise, but faces challenges in institutional planning, communication, collaboration, and team-building. Current planning processes often lack stakeholder engagement, leading to incomplete strategies. Communication issues result in uncertainty, and collaboration intentions are not fully realized, causing siloed operations. Team-building remains essential for leadership success.

Leaders participate in professional development activities, such as workshops and comparative studies with other universities. Regular meetings provide a platform for sharing insights and experiences, and leaders also take on additional roles to enhance their skills.

The university lacks a structured leadership succession plan, resulting in vacant positions and reduced productivity. The HR department also lacks an integrated system for managing recruitment, training, and performance.

Integrity is critical for leadership effectiveness, fostering trust and transparency. Effective planning requires proactive strategies and alignment with the university's vision. Improved communication and collaboration are necessary for better decision-making. Leaders need critical thinking and innovation skills to drive the university forward.

Article: "reconciling hard and soft skills"

This document explores the distinction between hard and soft skills, proposing a unified framework called the Generic Skills Component Approach. This approach consists of five components—knowledge, active cognition, cognition, affection, and sensory-motor abilities—to provide a comprehensive understanding of skill development, applicable in education, training, and the workplace.

Hard skills are technical and quantifiable abilities, like programming or accounting, acquired through formal education. Soft skills, such as emotional intelligence and communication, are non-technical and often developed through social experiences. Both are interdependent and crucial for success, often overlapping in certain contexts.

This framework combines cognitive, affective, motivational, and behavioral components. It includes five components: knowledge (facts and memory); active Cognition (decision-making and processing information); conation (motivations and preferences); affection (empathy and emotional management); sensory-Motor Abilities (movement control and coordination)

The approach can be applied in education to create more holistic skill development programs and in the workplace for hiring, performance evaluations, and employee growth.

Thorpe's articles

Article: "Knowledge and Skills of Industrial Employees and Managerial Staff for the Industry 4.0 Implementation"

This article examines the transformative skills and knowledge essential for leaders and workers in the context of Industry 4.0. The emphasis is placed on understanding advanced technologies such as the Internet of Things (IoT), Big Data Analytics, and cyber-physical systems, which are critical for enabling dynamic production and real-time data usage. Beyond technical prowess, the study underscores the need for a systemic perspective to integrate technological advancements with organizational practices. It also highlights the importance of interdisciplinary approaches to bridge gaps between human and machine interactions, ensuring efficiency in complex industrial systems.

Article: "Soft Skills and Their Importance in the Labour Market Under the Conditions of Industry 5.0"

This article explores the critical role of soft skills in shaping the future workforce within Industry 5.0. It identifies empathy, emotional intelligence, and effective collaboration as key attributes leaders must cultivate alongside technological innovation. The study argues that balancing human-centric values with technological advancements fosters a harmonious work environment that drives innovation. Moreover, it calls for leaders to prioritize employee engagement and adapt managerial practices to align with the evolving dynamics of high-tech workplaces.

Article: "Examining Best Practices in Curriculum Design: Insights for Engineering Education"

This article delves into the importance of reimagining engineering education to prepare students for Industry 4.0 and 5.0. The authors propose integrating hands-on learning, interdisciplinary collaboration, and real-world problem-solving activities into curricula. They stress that engineering programs must evolve to equip students with both technical expertise and adaptive skills to address the challenges of increasingly complex work environments. The article also emphasizes the value of bridging the gap between academic institutions and industry to foster practical skill development and innovative thinking.

Article: "How Industrial Maintenance Managers Perceive Socio-Technical Changes in Leadership in the Industry 4.0 Context"

This article investigates how industrial maintenance managers adapt to socio-technical transformations brought about by Industry 4.0. It emphasizes the dual necessity of technical acumen and human-centric leadership to manage resistance to change and ensure smooth

technological transitions. The study advocates for a leadership model that promotes adaptability, workforce collaboration, and clear communication to align organizational goals with technological advancements. It concludes that socio-technical integration is pivotal for maintaining operational stability in a rapidly digitalizing industrial landscape.

Article: "Preparing 5.0 Engineering Students for an Unpredictable Post-COVID World"

This article addresses the urgent need to equip engineering students with the skills to navigate the unpredictable post-COVID landscape. It highlights the increasing importance of VUCA (Volatility, Uncertainty, Complexity, Ambiguity) competencies, including flexibility, resilience, and continuous learning. The study recommends adopting experiential learning methods, such as job rotation and interactive training, to prepare students for future challenges. It also calls for fostering organizational cultures that support psychological safety and innovation, enabling students to thrive in a rapidly evolving professional environment.

Conclusion

In the era of Industry 4.0 and 5.0, effective leadership requires blending technological expertise with human-centric skills like adaptability, emotional intelligence, and collaboration. This framework emphasizes the integration of advanced technologies with interdisciplinary approaches, fostering innovation while addressing socio-technical challenges. By reimagining education and prioritizing continuous learning, it prepares leaders to navigate VUCA environments and drive sustainable growth in a rapidly evolving industrial landscape.

Géraud's articles

Article : "The future of leadership"

This work examines the effects of digital transformation on leadership, focusing on the skills required for effective leadership in a digitized environment. It is based on a survey conducted with 42 business leaders in Austria and Italy. The study concludes that traditional leadership skills, such as relationship management and active communication, need to be complemented by digital technologies.

Leaders must strike a balance between technology and human interactions to provide quality relationships with their teams, especially in a remote work context. The study identifies three dimensions of digital leadership: active communication processes, a primarily participative style, and clearly defined working conditions. Additionally, change management skills and strategic thinking are essential for integrating digitalization while mitigating resistance to change.

The study concludes that digital transformation calls for a return to the traditional virtues of leadership, combined with a strategic vision of technologies, rather than an in-depth technical knowledge.

Article : "The Future of Work"

In the wake of the technological, socio-economic, and demographic revolutions, this volume examines how work develops. It considers the challenges and opportunities for organizations, workers, and occupations. In particular, the COVID-19 pandemic hastened the adoption of new modes of working-from home, i.e., hybrid contexts, thereby unsettling traditional practices. Among others, this volume discusses the impact of digital technologies-e.g., artificial intelligence and data analytics-on occupations and contemplates the sustainability of new work models. It furthers introduces the critical notions of diversity and inclusion, higher education skills training, and the ethical implications of technologies. It emphasizes the urgent need for transdisciplinary research to validate any assumptions regarding the future of work and to identify vital skills for future generations. This book is a prime reference for researchers, policymakers, and practitioners seeking to understand and shape transformations in the world of work.

Article : "Past and future of work"

This study provides valuable insight into contemporary debates on automation and artificial intelligence in light of the historical context of previous industrial revolutions. It seeks to establish the relevance of history by offering an opportunity to anticipate the long-term effects of technological innovations on employment and society. The research presented enables a fruitful comparison between the Industrial Revolution of the 18th century and contemporary technological developments. The author demonstrates that the monumental event of automation not only involves the substitution of physical labor, as in past industrial revolutions, but also challenges human cognitive abilities. Historical analysis reveals a frequently overlooked aspect of the impact of technologies, which depends on individual and institutional choices. While advocating for thorough research into past technological transformations to inform debates on the future of work—particularly regarding technological unemployment, "assigning" careers, low-skilled jobs, and job polarization—the article calls for an interdisciplinary approach combining history, economics, and sociology.

Article : "Competence Development in a VUCA World"

This research aims to examine how to better prepare organizational employees to navigate a world increasingly characterized by VUCA (Volatility, Uncertainty, Complexity, Ambiguity). Within a qualitative framework, the identification of best practices for skill development includes, among other strategies, the implementation of job rotation, interactive training

sessions, and experiential learning. The authors emphasize the importance of flexibility, agility, and the existence of an organizational culture built on a psychologically safe and learning-oriented environment. However, challenges persist, notably time management and aligning methods with learner preferences. The proposed research seeks to make learning more accessible and to focus more on individual initiative, while also addressing the evolving roles of those responsible for skill development. This article suggests avenues for further research to strengthen organizational resilience in the face of the growing uncertainty of a professional world moving off the beaten path.

Article : "Think first job! Preferences and expectations of engineering students in a French 'Grande Ecole'"

The present study sheds light on the career aspirations of students in a prestigious French Grande École for their first job. These future engineers seek fulfilling roles characterized by autonomy, teamwork, and opportunities for personal development, all within a participative management framework. The engineering profession is perceived as solving problems through adaptable creativity, requiring the ability to learn quickly and tackle a wide range of challenges. Most students show a strong inclination toward management or entrepreneurship rather than purely technical roles.

The main challenges identified include integrating into a new work environment, addressing cultural diversity, and managing the mismatch between the expectations of future engineers and recruiters. Despite these challenges, students greatly enjoy the richness of their curriculum but would appreciate more regular interactions with alumni and professionals to gain a clearer understanding of the working world.

The study concludes that technical and managerial skills training must be further strengthened, relationships with companies through internships and projects should be intensified, and students' expertise regarding their identity-building projects needs to be better communicated. This approach should better prepare engineers to meet the demands of the professional world while adopting roles that align with a culture of conformity and aspiration.

MC's articles

Industry 5.0

The article explores the transition from Industry 4.0 to the emerging concept of Industry 5.0, highlighting the impact this next phase of the industrial revolution will have on businesses. While many companies are still in the process of digital transformation through technologies like artificial intelligence (AI), the Internet of Things (IoT), and cloud computing, the rapid pace of technological advancements suggests that Industry 5.0 is already beginning to

shape the future of business. Unlike Industry 4.0, which focuses on automation and digitalization, Industry 5.0 emphasizes the integration of human workers with advanced technologies, fostering collaboration between humans and machines. This shift aims to meet the growing demand for personalized products and services while enhancing productivity, quality, and customization through a synergy between machine efficiency and human creativity. The article highlights the importance of human integration into automated processes and the organizational and cultural challenges that must be overcome for successful transition. It also addresses issues such as digital competence gaps, infrastructure, and change management. The move to Industry 5.0 is seen as a natural progression, but overcoming significant obstacles, including the lack of digital skills and adapting business strategies, is essential. Businesses must be proactive and invest in both technology and talent to thrive in this new era, where the integration of human creativity with advanced technologies will be crucial in meeting the demands for personalization and sustainability.

Industry preferences

In South Africa, tertiary institutions do not offer Engineering Leadership Education (ELE) to undergraduate engineers, a gap that has persisted despite international recognition of the importance of leadership skills in engineering education. While the Engineering Council of South Africa (ECSA) acknowledges leadership as a key competency for professional registration, it has not defined the specific leadership skills engineers should possess, leaving South African universities without a structured framework for teaching leadership. In contrast, international bodies like the American Society of Civil Engineers (ASCE) have integrated leadership into engineering curricula as a core component, recognizing its importance in both technical and managerial roles.

Currently, leadership development in South Africa is expected to occur post-graduation through workplace experience, mentoring, and coaching. However, this lack of formal leadership education during undergraduate studies leaves graduates ill-prepared for leadership challenges. A study investigated the feasibility of introducing ELE in South African universities, based on international best practices and feedback from ECSA members. The study found widespread consensus that South African engineering graduates lack essential leadership skills, such as ethical behavior, trust-building, and project management, with many respondents rating graduates' leadership knowledge and competence as low.

The research recommended that South African universities introduce structured ELE programs within engineering curricula, focusing on leadership theories, ethics, decision-making, and communication skills. Such programs would provide a foundation for students to develop these competencies before entering the workforce, ensuring consistency across institutions.Furthermore, the study highlighted a lack of awareness about ELE in South Africa, with 44% of ECSA members unaware that leadership could be taught at the undergraduate level. There was strong support for integrating ELE into university curricula, with 91% of respondents favoring its inclusion. While most preferred ELE to be integrated into existing courses, rather than a standalone subject, the study pointed out that leadership

education should be a key focus in the curricula to prepare engineers for the evolving demands of the global workplace.

In conclusion, while South Africa has recognized leadership as a professional competency, there remains a significant gap in leadership training within engineering education. By adopting structured ELE programs, South African engineering schools could better equip graduates to meet the leadership demands of the modern workforce, improving their competitiveness both locally and internationally.

Industry revolution

Industry 5.0 represents the latest phase in the ongoing transformation of the manufacturing sector, where humans and machines work together more closely to improve productivity and deliver highly personalized outcomes. Unlike previous industrial revolutions, Industry 5.0 emphasizes the collaboration between human workers and advanced technologies such as artificial intelligence (AI), machine learning, and the Internet of Things (IoT). This revolution aims to enhance customer satisfaction through the mass customization of products, driven by the integration of digital technologies that enable manufacturers to analyze large datasets and solve complex problems. In a rapidly evolving global business environment, Industry 5.0 is critical for companies seeking to maintain a competitive edge and stimulate economic growth. Robots, which play a central role in this revolution, assist humans in tasks that require precision, such as data processing and forecasting, thereby improving the efficiency and accuracy of industrial processes.

Building on the advancements of Industry 4.0, which emerged in the early 2000s with innovations like IoT, big data, 3D printing, and AI, Industry 5.0 introduces new features like smart manufacturing, advanced robotics, smart materials, and 5D printing. One of its defining characteristics is the seamless integration of the physical and virtual worlds,

facilitated by intelligent agents and automated systems powered by AI. This shift from mass production to mass personalization allows for the creation of customized products tailored to individual consumer needs. Another hallmark of Industry 5.0 is the growing collaboration between humans and robots, or human-robot co-working, which aims to optimize manufacturing efficiency, minimize errors, and accelerate production processes through the combination of human intelligence and robotic precision.

Looking to the future, some experts suggest that the next phase, Industry 6.0, could be driven by quantum computing. Quantum computing, which leverages the principles of quantum physics, is expected to revolutionize decision-making in business, particularly in areas like financial risk management and project planning. Its ability to process massive datasets with high accuracy is anticipated to have a transformative effect on industries by improving predictions and optimizing processes such as machine design and material science. In particular, quantum computing could further enhance AI capabilities, helping to identify patterns in large datasets and enabling breakthroughs in fields like autonomous vehicles, medical treatment modeling, and material discovery.

As we move into the era of Industry 5.0, mass personalization and smart manufacturing are rapidly evolving. Robots working alongside humans are playing an increasingly vital role in these advancements. This paper examines the history of industrial revolutions, the impact of Industry 4.0 and Industry 5.0 on manufacturing and society, and highlights the key features and capabilities of these new industrial phases. It also contrasts the differences between Industry 4.0 and Industry 5.0, illustrating how these technologies will shape the future of manufacturing and the broader economy.