


# Impact of Industry 6.0 on the Education Sector Specially with Reference to Management Education

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## I. Abstract :

Industry 6.0 is an emerging concept that extends earlier industrial paradigms toward hyper-connected, AI-driven, adaptive, and sustainability-oriented systems. Recent literature describes it as a cognitive and autonomous industrial environment built around technologies such as generative AI, advanced digital twins, pervasive connectivity, and distributed intelligence. In the education sector, these shifts are pushing institutions to redesign teaching, curriculum, assessment, and governance. The present paper examines the impact of Industry 6.0 on education with special reference to management education. The study is conceptual and descriptive in nature and is based on secondary sources. The paper finds that Industry 6.0 is likely to reshape management education through personalized learning, AI-enabled decision support, simulation-based pedagogy, stronger industry-academia integration, and greater emphasis on sustainability, ethics, innovation, and interdisciplinary skills. At the same time, concerns relating to academic integrity, data privacy, faculty readiness, and digital inequality remain significant. The paper concludes that management institutions must move from conventional content delivery to future-ready, technology-enabled, human-centered learning systems.

**Keywords:** Industry 6.0, Management Education, Higher Education, Artificial Intelligence, Digital Transformation, Sustainability, Business Schools etc.

## II. Introduction:

Education has always evolved alongside industrial and technological change. The movement from Industry 4.0 to Industry 5.0 brought attention to automation, digitalization, human centricity, and sustainability. More recent literature now frames Industry 6.0 as a still-emerging but increasingly coherent paradigm centered on cognitive autonomy, hyper-connectivity, generative AI, advanced digital twins, and regenerative or sustainability-oriented industrial systems.

This transition has major implications for the education sector, especially for management education, because business schools are expected to prepare future managers, entrepreneurs, analysts, and policy leaders for volatile, technology-intensive environments. Management graduates will increasingly work in organizations where decisions are supported by AI, operations are monitored through digital twins, collaboration happens across physical and virtual systems, and sustainability is treated as a strategic imperative.

Therefore, management education can no longer remain confined to traditional lectures on accounting, marketing, finance, and organizational behavior alone. It must incorporate analytics, AI literacy, platform thinking, ethical

governance, systems thinking, innovation management, and sustainability leadership. This paper studies how Industry 6.0 influences such changes.

### III. Objectives of the Study

1. To understand the concept and features of Industry 6.0.
2. To examine the impact of Industry 6.0 on the education sector.
3. To analyze the implications of Industry 6.0 for management education.
4. To identify emerging competencies required in management students.
5. To suggest measures for strengthening management education in the Industry 6.0 era.

### IV. Review of Literature :

• **Carmo, Lacerda, Klingenberg, and Piran (2025)** examined digital transformation in the management of higher education institutions and found that higher education is increasingly shaped by technology integration, operational redesign, and new management models. Their review identified 20 technologies, four categories of implementation challenges, and several critical success factors, which is highly relevant for management education in an Industry 6.0 environment.

• **Mabotha et al. (2025)** systematically reviewed digital transformation in the higher education sector and concluded that technological advancement has already transformed universities' business models, institutional processes, and educational practices. This study supports the argument that management education must adapt structurally, not just pedagogically, to advanced industrial paradigms.

• **Dissanayake et al. (2025)** conducted a bibliometric analysis on artificial intelligence in management education and showed that AI, particularly generative AI, is emerging as a transformative force in business and management education globally. The study is important because it directly connects AI adoption with the future redesign of management education.

• **Xu and Ouyang (2021)** discussed AI in business curriculum and proposed a graduate-level AI course model for business schools. Their work demonstrates that management education must blend AI fundamentals with practical managerial applications, which aligns strongly with Industry 6.0 competency requirements.

• **Singun (2025)** identified nine major barriers to digital transformation in higher education institutions, including digital vision, leadership, organizational readiness, competence, and digital ethics. This study is valuable because it shows that the transition toward Industry 6.0-oriented education will be constrained unless institutions address managerial, infrastructural, and ethical barriers together.

• **Matos et al. (2025)** provided a systematic review of AI applications in education and emphasized both effectiveness and implementation challenges. The study shows that AI is no longer peripheral in education, making it a foundational element for future-ready management programs.

• **Abdallah, Katmah, Khalaf, and Jelinek (2025)** reviewed ChatGPT use in higher education and found that it improves accessibility, engagement, tutoring support, and feedback generation, while also raising concerns around academic integrity, technostress, and over-reliance. This is especially relevant for management education, where analytical independence and ethical judgment are central learning goals.

• **Wang, Jing, and Shen (2025)** systematically reviewed generative AI in higher education teaching and found that engineering, health, medicine, and language fields are currently the most active adopters, while most current applications remain at the augmentation stage rather than full transformation. For management education, this implies that GenAI integration is growing but still underdeveloped in many classroom contexts.

• **Petrova et al. (2025)** explored strategies for developing AI competencies in higher education and highlighted the need for curriculum designers, institutional leaders, and researchers to treat AI competence as a strategic priority. Their work is highly useful for management education because it frames AI literacy as a core graduate capability rather than an optional technical add-on.

- **AlBlooshi (2025/2026 online publication record)** reviewed opportunities and challenges of AI in higher education and concluded that AI affects students, teachers, and administrators across teaching, learning, and institutional functions. The study underscores that policy gaps and governance issues remain unresolved, which matters for management education because business schools must model ethical digital governance.
- **González-Pérez and colleagues (2025)** developed and validated a model for measuring technological maturity and digital transformation readiness in higher education institutions. The study is important because it provides a structured framework for evaluating whether institutions are prepared for more advanced educational environments associated with Education 4.0, Society 5.0, and by extension Industry 6.0.
- **Jwair (2025)** discussed generative AI in higher education and noted that widespread, low-cost access to GenAI tools is accelerating adoption for drafting, planning, and academic assistance. This supports the view that management education must move from passive digital use to responsible and strategic integration of intelligent systems.
- **Noroozi (2025)** introduced a special issue on AI in higher education and argued that AI is reshaping higher education through changes in pedagogy, participation, and institutional processes. This reinforces the idea that management education must evolve in parallel with AI-mediated learning environments.
- **Bashir (2025)** examined generative AI integration in management education institutes and argued that GenAI can significantly transform teaching-learning processes in management institutions. This source is directly relevant because it links AI adoption with curricular, pedagogical, and institutional change in business schools.
- **Adamakis (2025)** offered a state-of-the-art overview of AI in higher education focused on pedagogical integrity, AI literacy, and policy integration. The study is valuable because it highlights that effective educational transformation requires literacy and policy frameworks, not just technological availability.
- **Sanmugam, Khlaif, Wan Yahaya, and Abdullah (2024)**, in *A Practical Guide to Artificial Intelligence in Higher Education*, explain how educators can use AI to improve student engagement, learning outcomes, teaching practices, assessment, and ethical implementation. The book is especially useful for management education because it connects AI adoption with day-to-day pedagogical design.
- **Churi, Joshi, Elhoseny, and Omrane (2022)**, in *Artificial Intelligence in Higher Education: A Practical Approach*, discuss intelligent teaching-learning systems, e-learning, and AI-enabled assessment. The work is relevant for management education because it offers practical models for integrating AI into institutional and classroom processes.
- **Fellenz, Hoidn, and Brady (Eds.) (2022)**, in *The Future of Management Education*, examine how management education must respond to responsibility, sustainability, innovation, strategy, and technological change. This is one of the most directly relevant works for your topic because it frames future management education in terms that map closely onto Industry 6.0.
- **Machado and Davim (Eds.) (2024)**, in *Management for Digital Transformation*, address the managerial implications of digital transformation for organizations and systems. Although broader than education alone, the book is highly relevant for management education because it clarifies the managerial mindsets and competencies that future business curricula must develop.
- **Reimers, Azim, Palomo, and Thony (2026)**, in *Artificial Intelligence and Education in the Global South: A Systems Perspective*, cover AI and curriculum, assessment, teacher development, governance, and school organization. The book is important because it treats AI and education as a systems issue, which is essential for understanding Industry 6.0's broader implications for institutions and management training.
- **UNESCO's *Guidance for Generative AI in Education and Research* (2023)** emphasizes immediate action, long-term policy planning, and human-capacity development to ensure a human-centered use of GenAI. This is particularly relevant to management education, where technology adoption must remain aligned with ethics, governance, and human judgment.
- **UNESCO's AI in Education portal** states that AI can help address major educational challenges and accelerate progress toward quality education, but it also warns that technological progress has outpaced policy and regulation. This institutional position reinforces the need for management education to address both innovation and regulation.

- **OECD's *Future of Education and Skills 2030/2040* project** focuses on student agency, well-being, and competencies involving knowledge, skills, attitudes, and values. The framework is highly relevant for management education because it supports competency-based redesign rather than narrow content delivery.
- **OECD's *AI and Education and Skills* resource** highlights the importance of education and skills systems in preparing learners for an AI-influenced future. This source supports the argument that management education must produce graduates who can work with AI rather than compete blindly against it.
- **OECD's broader *Future of Education and Skills* policy resource** argues that as AI begins to outperform humans in areas like reading, mathematics, and scientific reasoning, education systems must rethink which skills to prioritize and how teaching methods should evolve. This insight is central for management education, where human-centered capabilities such as judgment, ethics, leadership, and strategic thinking become even more important.

#### **V. Findings of The Study :**

- **Industry 6.0 is redefining the education ecosystem**The study finds that Industry 6.0 promotes a shift from traditional education systems to intelligent, adaptive, and technology-driven learning environments. Educational institutions are increasingly adopting AI, data analytics, and digital platforms to enhance teaching-learning processes.
- **Significant transformation in management education**Management education is undergoing a paradigm shift from theoretical and lecture-based learning to experiential, simulation-based, and problem-solving approaches. Business schools are integrating real-time case studies, digital tools, and industry-based projects.
- **Growing importance of AI and data-driven decision-making**The findings indicate that AI and analytics are becoming essential components of management education. Students are required to develop competencies in data interpretation, predictive analysis, and AI-assisted decision-making.
- **Personalized and adaptive learning is increasing**Industry 6.0 technologies enable customized learning experiences based on individual student needs. Adaptive learning platforms and AI-based tutors are enhancing student engagement and academic performance.
- **Curriculum redesign is essential**The study finds that traditional management curricula are becoming outdated. There is a strong need to incorporate interdisciplinary subjects such as artificial intelligence, business analytics, sustainability, digital marketing, and innovation management.
- **Emphasis on skill-based education over theoretical knowledge**Industry 6.0 emphasizes practical skills such as critical thinking, creativity, problem-solving, leadership, and digital literacy. Employers increasingly value competencies over rote learning.
- **Strengthening of industry-academia collaboration**The findings highlight a growing need for collaboration between educational institutions and industries. Internships, live projects, and corporate training programs are becoming integral parts of management education.
- **Rise of simulation and digital twin-based learning**Advanced technologies such as simulations and digital twins are being used to replicate real-world business environments. This enhances students' ability to make strategic decisions in dynamic situations.
- **Increased focus on sustainability and ethical management**Industry 6.0 integrates sustainability and social responsibility into business practices. Management education is therefore placing greater emphasis on ESG (Environmental, Social, Governance) principles and ethical leadership.
- **Transformation of the role of educators**Teachers are no longer just knowledge providers but facilitators, mentors, and technology integrators. Faculty members are required to continuously upgrade their digital and pedagogical skills.
- **Institutional digital transformation is accelerating**Educational institutions are adopting smart systems for administration, learning management, and student assessment. This enhances efficiency but also requires strong digital infrastructure.
- **Emergence of new career opportunities**The study finds that Industry 6.0 creates new job roles such as AI managers, data strategists, digital transformation consultants, and sustainability officers, which management education must address.
- **Digital divide remains a major challenge**Despite technological advancements, unequal access to digital infrastructure and resources continues to be a significant barrier, especially in developing regions.

- Ethical and privacy concerns are increasing The use of AI and data-driven systems raises issues related to data privacy, academic integrity, and ethical decision-making, requiring strong regulatory frameworks.
- Need for continuous learning and adaptability The dynamic nature of Industry 6.0 requires lifelong learning. Management graduates must continuously update their skills to remain relevant in the evolving job market.

## VI. Conclusion of The Study :

The present study concludes that Industry 6.0 represents a transformative shift that is redefining the structure, delivery, and objectives of the education sector, particularly management education. Unlike earlier industrial paradigms that focused primarily on automation and digitalization, Industry 6.0 emphasizes intelligent, autonomous, and sustainable systems supported by advanced technologies such as artificial intelligence, data analytics, and interconnected digital platforms. This transformation necessitates a fundamental reorientation of educational systems to align with the evolving demands of the modern industrial environment.

The findings of the study indicate that management education is undergoing a significant transition from traditional, theory-based approaches to dynamic, technology-driven, and skill-oriented learning systems. The integration of AI-enabled tools, simulation-based learning, and data-driven decision-making frameworks has enhanced the quality and relevance of management education. Business schools are increasingly focusing on experiential learning, interdisciplinary curriculum design, and industry collaboration to prepare students for complex and uncertain business environments.

Furthermore, the study highlights that Industry 6.0 has expanded the scope of management competencies beyond conventional domains. Future managers are expected to possess not only technical and analytical skills but also critical thinking, creativity, adaptability, ethical reasoning, and sustainability-oriented leadership. The emphasis on Environmental, Social, and Governance (ESG) principles reflects the growing importance of responsible management practices in the contemporary business landscape.

However, the study also identifies several challenges that may hinder the effective implementation of Industry 6.0 education. These include inadequate digital infrastructure, lack of faculty preparedness, ethical concerns related to artificial intelligence, and the persistent issue of digital inequality. Additionally, the rapid pace of technological change poses a challenge for curriculum development and policy formulation, as educational institutions often struggle to keep pace with industry advancements.

In conclusion, Industry 6.0 has the potential to significantly enhance the effectiveness, accessibility, and relevance of management education by fostering innovation, personalization, and industry alignment. Nevertheless, its successful integration requires a holistic approach involving curriculum reform, faculty development, technological investment, and strong governance frameworks. Educational institutions must adopt a proactive and adaptive strategy to ensure that management graduates are equipped with the knowledge, skills, and values necessary to thrive in an increasingly intelligent and interconnected global economy.

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