



What is 4IR or Industry 4.0, and how will it impact Learning Development?

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Presentation abstract

Industry 4.0 or the Fourth Industrial Revolution (4IR) is quickly changing the world with a shift towards automation and digital technology, most notably, for example, the large impact of generative artificial intelligence (AI). Organisations such as the World Economic Forum (2024), McKinsey and Company (2022) and Skills Development Scotland (2018), believe that Industry 4.0 will change the way we work and live, with implications for everyone. These organisations argue that we need to become lifelong learners and develop ‘future-ready skills’, particularly adaptability, creativity, critical thinking and problem-solving. Despite the predicted large changes Industry 4.0 will bring, there is little conversation about it in the higher education sector beyond the immediate impact of using AI. This paper aimed to raise awareness of Industry 4.0, and the potential challenges and opportunities it brings, focusing on the implications for Learning Development.

Inspired by conversations and questions during a mini-keynote at ALDCon 2024, this paper briefly explored what Industry 4.0 is, concentrating on the potential changes within higher education and human-centred outcomes. Moreover, it explored the implications for students, looking at both their student experience but also their transition to the workplace. Specifically, it explored the following implications:

- Navigating multiple (and increasingly unknown) futures.
- Understanding and preparing for digital disruption both during their studies and future employment.
- Maintaining agency and autonomy during their studies in an increasingly automated system.

Finally, the paper focussed on the implications for Learning Development and those who work in this area. Specifically, it explored the following implications:

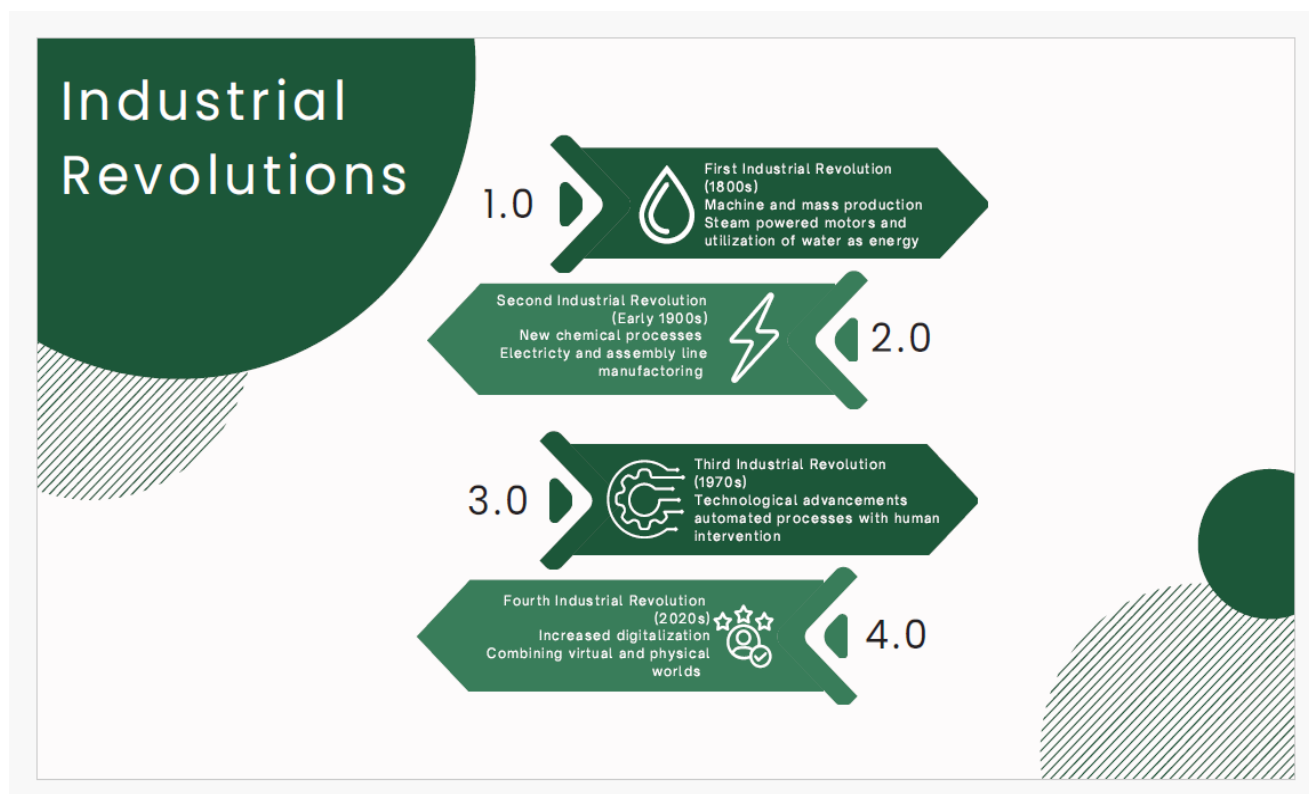
- How 'future-ready skills' can be integrated into curriculum and co-curriculum activities.
- The need for student-centred skills development and how this can be implemented.

The paper questioned how and if our roles will change and secondly what (if any) changes we should make to support learners at our institutions. Overall, this paper hoped to inform on the key aspects of Industry 4.0, the possible effect on Learning Development and facilitate discussion on the topic.

Keywords: skills for the future; Learning Development; Industry 4.0; future-ready skills; student-centred.

Community response

As was set out and intended to be addressed by Rebecca Wilson, the community remarked upon how this paper constructively set out a stimulating history of the previous industrial revolutions and their impact on education (see Image 1). This contextual backdrop delivered on Rebecca's promise to raise awareness of Industry 4.0 for the Learning Development community and situate this complex industrial era we are entering into and contending with in higher education. This account offered by Rebecca reveals that Industry 4.0 extends far beyond the current pre-occupation with generative artificial intelligence and consists of many other components including robotics, biotech, big data augmented reality etc., all of which blends the digital and physical worlds that educators operate within. These digital technologies and components then are inextricably linked within the everyday practices in higher education and can remodel the practices of educators and students (Gravett and Bearman, 2025).

Image 1. Presenter's slide: Industrial revolutions in education

In thinking about all the potential implications of Industry 4.0, including rapid advancements in technology and attempts by society to keep up to date with the rate of change, this led to another key takeaway for the community members which was centred around Rebecca's spotlight on educators and students 'skills for the future.' This included critical thinking, problem solving, adaptability, and creativity. It seemed that outlining these skills offered a useful starting point of practical areas where Learning Developers and educators could focus their attention in their roles against the backdrop of Industry 4.0 to best help students to prepare students for the futures they face. This idea was encapsulated by Jo Dowds who remarked about Rebecca's paper, 'particularly helpful, for me, was the anecdotal image of educators as a "trellis" that guides and directs student growth'.

Next steps and additional questions

Jo Dowds left the Learning Development community with a series of pertinent reflective questions from this paper that flipped Rebecca Wilson's important focus on student-centredness by encouraging us to also focus upon educators and Learning Developers'

perspectives. This leaves us with some critical thoughts and thought-provoking questions for consideration as posed by Jo:

- As educators, should we not already be taking a student-centred approach, so what is new about this approach that matches the 'new' context we find ourselves in?
- Has the introduction of the 4IR (amongst other factors such as Office for Students) 'forced our hand' to focus on the students already? If invariably a new generation of students lead the way in digital innovation and understanding, then perhaps more pertinently what we need is an 'educator-centred approach' that causes us to fundamentally redesign our model and understanding of teaching and facilitation.
- What do we need to be learning and responding to as educators?
- How can we respond well to student needs and facilitate guided learning in an age where knowledge is no longer the most prized currency, yet critical thinking is?

Author's reflection

The presentation and following discussions had two halves. Firstly, we explored and defined Industry 4.0, including how this new industrial revolution is not only about AI but the increased merging of the physical and virtual worlds in an age of vast digitalisation. Specifically, we explored the impact of Industry 4.0 within higher education. We began to unpick how automation and integration are going to lead to accelerated change, with knowledge advancing at an unprecedented rate. Subsequently, an increasing need for human-centred skills is unfolding, including skills such as critical thinking, problem solving, adaptability and creativity.

The second half of the discussion focused on the impact of Industry 4.0 within the Learning Development community. The discussion included logistical challenges such as keeping up to date with technology and knowledge. We also explored the exciting opportunities of change, as Learning Developers will have the opportunity to showcase their expertise with a need for student-centred partnerships and skills development to support students in navigating the changing world.

In particular, I called for this student-centred partnership to be holistic; in this approach, experiences are not compartmentalised but instead treated as interconnected in terms of how they are acquired and developed. Therefore, skills developed at university are not due to academic activities alone. Instead, we must recognise the importance of co-curricular and extracurricular activities, including voluntary, care, and paid work. A holistic approach allows students to develop a greater sense of academic identity and belonging by reflecting on their wider university experience. In addition, this holistic approach also supports the changing demographic of university students and their varied higher education experience.

Acknowledgements

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The authors did not use generative AI technologies in the creation of this manuscript.

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