

Chapter 83

The Future of Product Design Education Industry 4.0

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ABSTRACT

When a society is undergoing transformational change, it is a challenge for all involved to step outside their immediate context sufficiently to evaluate its implications. In the current digital revolution driving Industry 4.0, the pace of change is rapid, and its scale and complexity can inhibit a proactive, rather than reactive, response. Yet if it were possible to return to the first industrial revolution, armed with twenty-first century knowledge and historical perspective, planning for a healthy society and the future of work could have been very different. This chapter aims to support educational leadership in the development of proactive strategies to respond to the challenges and opportunities of Industry 4.0 to inform the future of work, industry, and society. This is framed through the lens of product design, with its unique position at the nexus of engineering and the humanities, and directly tied to changes affecting manufacturing in the fourth industrial revolution.

INTRODUCTION

From disruptive technology to disruptive ideas, the early decades of the twenty-first century can be characterized as a period of non-conformity and new direction. Whilst globalization and amalgamation dominated economic strategy at the turn of the century, the predicted homogenization into a world without borders has been fractured by a backlash of nationalism and separatism, burgeoning entrepreneurship and new business practices based on a sharing economy. In this setting, the expectation could be that product design education would be working through a corresponding period of radical change, yet in many universities, with higher numbers and reduced funding, there are increasing pressures to conform to a

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modularized education system; design has become a linear process, and limited approaches to creativity are prescribed with diluted outcomes defined by business school drivers and design thinking approaches to interdisciplinary practice. This chapter questions the dominant influences in prevailing product design education, challenging existing thinking in the disciplines to call for educational reform in the face of outdated conventions and thinking. If the discipline is to remain relevant in this era of digital disruption and rapid technological advancements, then pedagogy must be subject to critical scrutiny in order to ensure that the pathways aligned with this approach are not restricted by existing practices and closed thinking. This chapter argues for academics to learn from the past and present in designing pedagogy and curriculum, informing the need for change to ensure authentic learning for product designers in the twenty-first century.

BACKGROUND

Product design emerged as a profession during the eighteenth century in response to the drive towards mass production and the design challenges it created. According to design historian Adrian Forty, in his seminal book, *Objects of Desire* (1992), the earliest product designers in the UK employed by innovators, such as Josiah Wedgwood, were educated on European trends in art and architecture, as well as the reduction of a design into repeatable components. Production uniformity and aesthetic conformity became megatrends of the time and were central to design development, allowing manufacturers to produce standardized products within an orderly system of centralized manufacturing. The impact on the organization of labor, and subsequently lifestyle and the urbanization of the population, was relatively gradual. During the late nineteenth and early twentieth century, however, as Ford established the moving assembly line, the pace of urbanization changed with large-scale factories drawing in workers from large distances (Sparke, 2013). For designers, their role became increasingly constrained by mass-manufacturing processes and practices, with these being the driving technologies of the times. Design had to conform to assembly rules, and generally the lower the cost of components the higher the margins for business. For workers, the transition to working within a system where labor was divided to its most basic action became common place. The impact on the organization of society was immense.

The transition can be characterized as a shift from traditional hand production to massive industrial machinery and factory production. To a large extent it was stimulated by the invention of large-scale manufacturing processes fuelled by the discovery of new methodologies for exploiting the energy stored in huge iron and coal deposits. The subsequent access to apparently unlimited energy and human resources engendered by the rise of capitalism and individual and corporate entrepreneurship and innovation, marked a major transition in human affairs. The Industrial Revolution was the socioeconomic equivalent of the Big Bang. (West, 2017, p.211)

Following the Second World War, building the economy was seen as paramount, with marketing and mass production scaled up. This drive meant that designers during the twentieth century were frequently locked into the contradictory practice of trying to design the best possible outcomes yet encourage obsolescence for repeat sales. Dissenters, such as Victor Papanek, argued for a sense of moral responsibility in design. He was shunned during his early career following the publication of his seminal work, *Design for the Real World* in 1971 (revised edition 2005), but as the social and environmental impacts

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