Chapter 14
Design Thinking in Higher Education: How Students become Dedicated Creative Problem Solvers

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ABSTRACT
This chapter introduces design thinking as an educational approach to enhance creative problem-solving skills. It is a problem-based learning paradigm that builds on three pillars: A creative problem solving process, creative work-spaces and collaboration in multi-perspective teams. This chapter discusses central elements of design thinking education and contrasts the approach to conventional education as well as other problem-based learning paradigms. In particular, design thinking classes harness a unique “look and feel” and “verve” to help students acquire and experience creative mastery. Furthermore, the chapter overviews empirical studies on design thinking education. Four studies are described in more detail: Experiments on the three pillars of design thinking and one case study where a university class curriculum has been changed to a design thinking paradigm. Finally, the chapter provides resources for readers who want to learn more about design thinking education.

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INTRODUCTION

Many countries recognize a need for curricula changes to enhance skills that used to be neglected in school and university education (Noweski et al., 2012; Rasfeld, 2015; Wagner, 2010). One central concern is to help students become dedicated creative problem solvers. In addition, students need to acquire co-operation skills to collaborate in interdisciplinary teams. Many pressing problems today cannot be solved on the basis of specialized knowledge from one single discipline alone.

Design thinking has been identified as a promising approach to help students become creative problem solvers and socially competent team-workers. The approach was pioneered in fields like architecture and mechanical engineering. Originally, it was used to develop innovative products or services that would not only benefit companies financially but also helped to tackle pressing societal problems, like high crime rates or poor health (Brown, 2009; Asquith, Dorst, Kaldor, & Watson, 2013). However, the approach soon turned out to be useful far beyond classical design disciplines. Researchers and practitioners have become interested in design thinking as a means to build up creative confidence, creative agency and creative mastery (Jobst et al., 2012; Kelley & Kelley, 2013; Rauth, Köppen, Jobst, & Meinel, 2010; Royalty, Oishi, & Roth, 2012, 2014). An increasing number of universities opened up design thinking institutes to help students acquire creative problem-solving and collaboration skills that are hardly encouraged by traditional schooling. Great numbers of applicants indicate a substantial interest of students in such unconventional trainings. The quick expansion of the Hasso Plattner Institut (HPI) School of Design Thinking at the University of Potsdam in Germany is a good example. It started off in 2007 with 40 students from 30 different disciplines. Due to strongly increasing numbers of applicants from all around the globe, in 2015 the institute trains 120 students per semester, who currently stem from 20 different nations and have been trained in 70 different disciplines. Students dedicate 2 days of the week to their design thinking training, either for one semester or for a whole year. At the same time they continue their conventional university education on the remaining 3 days of the week.

Regularly, in design thinking classes, students seem to develop a passion for their work that is rarely observable in conventional schooling. Many students quickly develop autonomy and even creative mastery in solving problems. At the same time, design thinking classes teach few things explicitly. Rather, the classes use and teach a work culture of joy, collaboration, action, wild experimentation and rapid learning out in the field. Design thinking impacts the mindset of students more than building explicit knowledge.

This chapter provides a short introduction to design thinking education. The first part introduces design thinking as one approach to problem-based learning, which has quite unique features. The second part discusses empirical studies that investigate the mechanisms and effects of design thinking education, focusing in particular on the development of creative problem solving skills among students. The third part provides resources for readers who wish to learn more about the subject.

FUNDAMENTALS OF DESIGN THINKING EDUCATION

Design thinking is an example of what the community calls “problem-based learning” (Barrows, 1996; Carleton & Leifer, 2009; Schmidt, 1983). Students work in teams on open-ended problems. They decide quite autonomously how to move their projects forwards. Formal lectures are rare and short. Teachers do not claim “authority of knowledge” (Zhou & Valero, 2016, p. 134). Rather, they act as facilitators.