

Chapter 8

Professional Socialization in STEM Academia and its Gendered Impact on Creativity and Innovation¹

Gloria-Sophia Warmuth

Vienna University of Economics and Business, Vienna

Edeltraud Hanappi-Egger

Vienna University of Economics and Business, Vienna

ABSTRACT

The chapter focuses on internal professionalization processes in STEM academia and their impact on creativity and innovation capacity. The discussion looks at how internal structures and value systems in STEM academia are used to shape the professional self-understanding of members. Exemplified by a higher education institution in the field of science, engineering, technology and math we show how gendered exclusion and inclusion is established structurally. Restrictive and rigid professional scripts and role expectations are identified as the main obstacles to greater potentials for creativity and innovation.

INTRODUCTION

The lack of women in the fields of science, technology, engineering and math (STEM) is a persistent phenomenon, and one that provokes widespread discussion. Hence academics as well as practitioners are searching for ways to attract more women into these professions. In particular, it is argued that the creativity and innovation potential of entire sectors suffer from this low gender diversity (see also Hanappi-Egger, 2011).

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Science, technology, engineering and math are seen as professional fields requiring both creativity and innovative thinking, which serve not only to drive these particular sectors but also society as a whole. Research on creativity has traditionally focused on individuals and their creative capabilities (Guilford, 1970). Industries with a high demand for creativity and innovation have generally relied on hiring creative staff to achieve their goals. In the meantime more and more studies are looking at the impact of work culture and

conditions in attracting, promoting and binding creative individuals and creative thinking (Amabile, 1996; Henry, 2001). Working conditions and organizational structures are now considered to impact the creative capacity of staff. Since creativity is seen as “the production of novel and useful ideas” (Amabile, 1996, p. 1), organizations must foster an environment that permits and indeed encourages thinking and behaviour that is different from the status quo; to some extent creativity necessarily challenges given and accepted ways of doing. Reflecting this line of research, the current chapter attempts to answer the question: How does academia in STEM, use their internal values and norms to mainstream (not to say male-stream) the professional self-understanding of their members, and how does this consequently limit the creative potential of the field?

The chapter is structured as follows: First the topic of professional socialization and its gendered nature is introduced. Second, based on Barley’s structuration model of careers, the role of gender scripts in mainstreaming in STEM organizations is examined. This theoretical discussion is followed by a case study conducted at an Austrian higher education institution of STEM. This study will give an in-depth view of an institution, examining both its organizational and professional culture. We identify rigid professional understandings that can produce feelings of unease in some actors, leading to exclusion of those individuals unwilling to play by the rules. Moreover, this example illustrates the incorrect notion that innovation and creativity are strictly and solely embedded in the individual. At the institution in question, structural frameworks that could support a creative surrounding for working teams with diverse ideas are not regarded as driving forces for innovation and creativity. The chapter concludes with lessons learned in how to foster greater diversity and thus space for creativity.

PROFESSIONAL SOCIALIZATION IN STEM ORGANIZATIONS

When new staff members join an organization, they are immediately confronted by its internal structures and value systems. The subsequent process of professional socialization requires them to internalize the particular values, norms and symbols of the work culture (Hanappi-Egger, 2004; Hanappi-Egger & Warmuth, 2010) in order to become an accepted expert in the field. In general, each occupation has its own set of norms, values, characteristics and attitudes that are expected of its members (Schein, 1978). Those not conforming to the professional culture are discarded at an early stage of their career (Dryburgh, 1999), either by exclusion or self-exclusion² (see also Hanappi-Egger, 2012a for the example of female IT specialists who abandon their chosen professions). Newcomers who wish to remain in an organization must demonstrate their sense of belongingness to the professional culture and their close identification with it. McIlwee and Robinson (1992) claim that conformity is achieved both through interaction and impression management (which describes the *appearance* of conformity to organizational culture rather than *actual* conformity). It is assumed that people whose personal value systems closely accord with organizational values can more easily adapt than those whose value systems are at variance. To act against one’s self-understanding clearly entails costs in terms of energy and effort.

STEM organizations are viewed as having highly specific workplace cultures, particularly in the way that gender-based practices, structures and interactions are integral to their culture (Rhoton, 2011, p. 698). Many scholars have discussed the historically gendered nature of the STEM field (Hanappi-Egger, 2012b), arguing that masculine values are inscribed into STEM and *vice versa* (Wajcman, 2000; Faulkner & Lohan, 2004; Wajcman & McKenzie, 2005). Certainly it is true that science, technology, engineering and

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