Chapter 6
Adapting to New Labor Market Characteristics

William Buchanan
Clarion University, USA

ABSTRACT

In this chapter, the author describes the education for the professions in the nineteenth century, with particular emphasis on the extent to which professional education relied on the apprenticeship model rather than on formal, university-based education. The author describes how such non-standardized education was eventually brought under control after the establishment of professional associations which sought to standardize such education. With the establishment of such standards, the education of professions was eventually brought into a higher education setting where disciplinary education programs co-existed within a standardized education environment. This coexistence or colocation enabled professional education efforts to begin interacting with each other and gave rise to interdisciplinary, multidisciplinary, and transdisciplinary efforts in the preparation of professionals for the workforce. The author reports on the variety of interdisciplinary educational programs that have emerged in higher education and demonstrates the availability of professional positions that exist in the work force for new graduates with interdisciplinary and multidisciplinary educational preparation. Routes to attaining an interdisciplinary education are discussed, including student-designed interdisciplinary educational programs as well as predesigned interdisciplinary programs in which students may enroll. The role of higher education program directors and student advisors is considered as well as their importance in enabling students to transition into interdisciplinary careers. The concepts of problem passing and problem solution are described as a means of enabling various disciplines to work together (particularly in localized settings) to generate new interdisciplinary solutions to problems, particularly in the area of the applied sciences. Suggestions for further reading are provided.

COMING IN FROM THE COLD

The so-called "silo effect" dominated academia for years and – by extension – the practice of the professions and knowledge-based career paths pursued by graduates of the academy. The IGI Dictionary defines the silo effect as the "lack of information exchange between data base systems within an entity or with outside entities. The silo may be limited to the technical deficiencies of the system, but the effect encompasses the larger human problem of the silo mentality, which includes a predisposition away from sharing such information."

In the silo effect knowledge – both pure and applied – is created and grown vertically within the knowledge category without significant exchange with other silos of knowledge or supporting input from other silos. This phenomenon is at least partially rooted in the pre-20th century tradition of professional preparation through apprenticeship wherein professions and professional practice were learned by associating oneself with an established practitioner. This professional preparation occurred outside the university so that would-be lawyers, physicians, librarians, etc. rarely came into contact with other learning communities. It was not until the rise of professional associations in the late 19th century that standards for education for professions began to be established and these standards eventuated into the establishment of learning environments dedicated to meeting these standards. The results are today's schools of library science, colleges of engineering, and faculties of medicine. In the words of John le Carre, the professional disciplines had "come in from the cold," (*The Spy Who Came in from the Cold*, p. iv) where interdisciplinarity could take root and eventually flourish.

The interdisciplinarity that has grown up in academia is now a robust landscape of interdisciplinary areas of study such as programs in area studies (e.g., Latin American Studies) which originally grew from various disciplines (language, history, religion, etc.) focusing their inquiries and problem solving abilities on a specific geographic region. These interdisciplinary efforts have by now become so institutionalized that they form their own discipline.

A report produced by the North Carolina State University expands upon this idea:

"Area studies appeared as a strategy in American universities in the late 1930s and was predicated on a belief in comprehensive, integrated knowledge. A 'doctrine of concentration' professed that 'the mind advances when wholly immersed in one interest but connections should be made with related subjects' (Klein, 1990, p. 27). It sought a restructuring of fields through theoretical perspectives regarding what disciplines had in common (for example, behavioral sciences or cultural geography). This approach altered the methods of social inquiry, but never impacted the cumulative science.

"World War II was the impetus for applied interdisciplinary work in research, and by the middle of the twentieth century the 'hyphenated sciences' (biophysics, biochemistry, etc.) were well established. Unlike earlier work, this research was mission driven. The Manhattan Project was a prime example of specialists needing to work together to accomplish a specific goal that could not be addressed by a single discipline (Klein, 1990, p. 32-34). Established in 1969, the National Science Foundation further reinforced this new definition of interdisciplinary research through its funding practices." (NC State Task Force on Comprehensiveness and Interdisciplinarity, 2011, p.2).

Focusing on the applicability of interdisciplinary studies for students preparing to enter the work force, the North Carolina State University report recommended that (NC State Task Force on Comprehensiveness and Interdisciplinarity, 2011):

- Undergraduate students "seek out interdisciplinary experiences, such as courses at the interfaces of traditional disciplines that address basic research problems, interdisciplinary courses that address societal problems, and research experiences that span more than one traditional discipline." (p. 3).
- Master's and doctoral students should "explore ways to broaden their experience by gaining 'requisite' knowledge in one or more fields in addition to their primary field." (p. 3).
- Postdoctoral scholars "should actively exploit formal and informal means of gaining interdisciplinary experiences during their post-doctoral appointments through such mechanisms as networking events and internships in industrial and nonacademic settings." (p. 3).

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