1. Entrepreneurship perspectives: an introduction

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I. INTRODUCTION

In the past decade or so, the study of entrepreneurship has expanded well beyond its traditional home in business schools. Scholars and educators in fields such as engineering, medicine/healthcare, science, arts/music, design, and architecture have shown great interest in entrepreneurship and indicated their potential to bring unique perspectives and insights on this topic. Terms such as ‘engineering entrepreneurship,’ ‘design entrepreneurship,’ ‘life sciences entrepreneurship,’ ‘health entrepreneurship,’ and ‘arts entrepreneurship’ (and the academic communities built around these topics in the respective fields) reflect this rapidly emerging research and pedagogical interest on issues related to entrepreneurship among scholars outside the business field. Indeed, entrepreneurship-related programs and courses tailored to the different fields and domains continue to be created in many schools and universities.

These initiatives have also given rise to diverse field- or discipline-specific perspectives of entrepreneurship. While there are some differences among these ‘entrepreneurship perspectives,’ there is also considerable opportunity to cross-fertilize and/or integrate unique ideas and insights on entrepreneurship from the different fields.

Such an opportunity currently remains largely untapped. There are numerous books and articles on entrepreneurship written by scholars in the business academia. However, given their primary focus (on business and management areas) and the nature of their audience (largely business school academics and students), there is very limited attention paid to entrepreneurship as interpreted in non-business fields such as engineering, science, arts, design, and health/medicine.

More recently, scholars and practitioners in non-business fields too have written books and articles on entrepreneurship – for example, on
II. GOALS AND OBJECTIVES OF THE BOOK

The primary objective of this book is to bring together these diverse field-specific perspectives on entrepreneurship and to build a broad cross-disciplinary understanding of entrepreneurship in ways that will advance the education and practice of entrepreneurship in all fields and disciplines. The book chapters incorporate and build on the different perspectives of entrepreneurship (that exist in fields such as engineering, science, arts, design, medicine/health, etc.) and speak to a broad audience of entrepreneurship scholars in the different fields.

There is another important reason for developing such an integrative or cross-disciplinary perspective of entrepreneurship. Over the last several years, innovation activities (development of new products and services) in fields such as engineering, science, information technology/information science, and medicine have increasingly become interdisciplinary. For example, in markets such as medical devices, e-medicine, consumer electronics and applications, biotechnology, energy, and so on, entrepreneurial (and innovation) activities have involved extensive collaboration among professionals in two or more of the above mentioned fields. A good example in this regard is e-medicine: many new ventures in this area have founders from fields such as information science, medicine, engineering, business, and arts/design. This indicates that there is a natural affinity among the above fields – at least with regard to innovation and entrepreneurship – and that it is imperative to adopt (research, educate, and practice) a cross-disciplinary view of entrepreneurship. This book is thus intended to offer a timely forum for entrepreneurship scholars in the different fields to come together and contribute towards such a more cross-disciplinary understanding of entrepreneurship. Overall, it is my hope that this book will help research and practice in entrepreneurship in the following ways:

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- Facilitate the development of cumulative knowledge on entrepreneurship by building on core themes and concepts identified in the different fields;
- Provide the opportunity to share entrepreneurship-related insights and best practices across fields;
- Support the development of entrepreneurship educational materials that can be shared across fields;
- Inform the development and evaluation of entrepreneurship policies and programs that cross or impact multiple disciplines or fields.

Before describing the individual chapters, a quick note on how this book may be used in entrepreneurship-related courses and programs. It can be used as a primary or secondary textbook for introductory courses on entrepreneurship in different schools and disciplines as it would enable students to understand the core aspects of entrepreneurship as practiced in their particular field and at the same time gain a broader perspective of entrepreneurship.

III. ORGANIZATION OF THE BOOK

Given the diverse entrepreneurship-related contexts, concepts, and ideas that exist in the different fields, the emphasis of the individual chapters is on drawing on such rich material and at the same time articulating the core concepts and insights in a way that would be understandable to a broad set of audiences (scholars, practitioners, and policy makers in all of the above fields and disciplines).

The book consists of ten chapters organized as follows. Following this introductory chapter (Chapter 1), we start with the engineering perspective of entrepreneurship and then move on to other fields.

In Chapter 2 (‘Engineering entrepreneurship: developing an entrepreneurial mindset’), Doug Melton (Kern Entrepreneurship Education Network – KEEN) presents a framework for fostering an entrepreneurial mindset among engineers. KEEN is a collaboration of around 19 U.S. universities that strive to instill an entrepreneurial mindset in undergraduate engineering and technology students. KEEN’s mission is to graduate engineers who will contribute to business success and in the process transform the American workforce. From his perch as the program director of KEEN, Doug examines the need for entrepreneurship education in engineering schools and suggests a more coherent approach in this regard. In particular, he focuses on how engineering education should focus on developing an ‘entrepreneurial mindset’ among students and
coupling that with engineering thinking and skills. He also describes Entrepreneurially Minded Learning (EML), a student-centered pedagogy in which students learn about a subject through the experience of identifying opportunities to create value. He identifies a set of EML skills that bring the emphasis to value creation and to the ‘know-why’ along with the ‘know-how’ in engineering education. Much of the entrepreneurship mindset framework that Melton presents here can be applied to entrepreneurship education in other disciplines and contexts.

In Chapter 3 (‘Challenges in faculty entrepreneurship in the sciences: becoming an entrepreneur but staying at the university’), Robert Brown (Case Western Reserve University – CWRU) expands on the growing importance of entrepreneurship education in the sciences. Drawing on his rich and extensive experience as an entrepreneur and as an academic in physics, Brown describes a model of faculty entrepreneurship – one that addresses the conflict of fulfilling faculty responsibilities and goals while meeting the demands of a new business. His approach (validated by his own personal experience across the past four decades or so) emphasizes two key factors: (1) the importance of identifying a major business partner(s) from a network of colleagues, which springs from industrial contacts and former students; and (2) the importance of finding viable business ideas through research collaboration in industry. Brown also describes an innovative graduate program in physics entrepreneurship that he founded and championed at CWRU. He concludes with a set of key insights on how a young faculty in the sciences can build a career as a full-time faculty and an entrepreneur.

In Chapter 4 (‘Physics entrepreneurship: an evolution from technology push to market pull’), Orville Butler and Joseph Anderson (American Institute of Physics) present an illuminating set of findings on entrepreneurship in the sciences from an extensive four-year study, supported by the National Science Foundation, that they conducted on physicist entrepreneurs. Drawing on interviews with more than 140 physics entrepreneurs and visits to 91 high technology start-ups, Butler and Anderson provide a fascinating account of the evolving character of scientist entrepreneurs. Starting from the basic question of who is a physicist (or scientist) entrepreneur, they go on to address many other interesting questions including whether entrepreneurship in the sciences is a learned behavior or an inherited characteristic and how ‘technology push’ entrepreneurs differ from ‘market pull’ entrepreneurs. They conclude by providing some insights into how we can prepare physicists (or more broadly scientists) for entrepreneurial pursuits.

Next, we turn to entrepreneurship in medicine, healthcare, and more broadly in the life sciences.
In Chapter 5 (‘Bioentrepreneurship: opportunities and challenges’), Arlen Meyers (University of Colorado Denver) examines the topic of bioentrepreneurship. Bioentrepreneurship is the pursuit of entrepreneurial opportunities in bio or life sciences leading to biomedical and health innovation. Myers presents the basic concepts of bioentrepreneurship, how it applies to other domains, and makes the case that innovation is the main sustainable competitive advantage for health service organizations and national health systems. He also describes in detail the innovative Master’s program that he created and leads at UC Denver in the area of bioentrepreneurship.

In Chapter 6 (‘Healthcare entrepreneurship: the changing landscape’), Cam Patterson and Andrew Kant (University of North Carolina at Chapel Hill) continue this discussion by focusing on healthcare entrepreneurship. This is an area that has exploded in recent years, fueled by the continuous need to improve quality of life for patients and strong R&D efforts at for-profit and non-profit entities. In this chapter they explore various challenges and rewards for healthcare entrepreneurship. They also consider the different initiatives and programs that can be adopted to foster entrepreneurial pursuits in medical schools and other healthcare educational institutions.

Next, we turn to entrepreneurship in arts, music, and design.

In Chapter 7 (‘The entrepreneurial musician: the Tao of DIY’), Angela Myles Beeching (Manhattan School of Music) considers how musicians are redefining entrepreneurship and offers highly insightful case studies along with perspectives on the ‘gift economy,’ musician entrepreneurial mindset and opportunities, and on the ramifications for entrepreneurship educators. As she notes, there is a Brave New World out there for musicians – thanks to new technologies (for example, file sharing, online recording and streaming), musicians face a destabilized profession that demands entrepreneurial approaches. An increasing number of conservatories and university music programs have added entrepreneurship courses and programming in a range of formats and services to address this emerging need. While schools may employ diverse pedagogical approaches, they need to be guided by the six key development areas for music entrepreneurs that Beeching identifies. There are lessons and insights here not just for entrepreneurship programs in music schools but in other fields as well – particularly on the relevance of fostering an entrepreneurial mindset when technologies and new business models disrupt professions and fields.

In Chapter 8 (‘Educating arts entrepreneurs: does, can or should one size fit all?’), Gary Beckman (North Carolina State University) and James Hart (Southern Methodist University) argues for a consensus
among arts entrepreneurship educators on the field’s desired student outcomes and curricular design. They note that without such a consensus, arts entrepreneurship classrooms will remain largely based on educator personal experience and individual research. After providing a brief history of arts entrepreneurship, Beckman and Hart flesh out the educational outcomes for arts entrepreneurship programs and illustrate that using a fictional vignette. In doing so, they also tease out some of the differences among programs targeting fine arts students and music/theatre students. Following that, they consider in detail the pedagogical approach that might be helpful in serving these outcomes. The authors conclude by identifying significant trends in the development of arts entrepreneurship training programs in a cross-disciplinary context (having a mixed classroom of arts and non-arts majors – including business majors).

In Chapter 9 (‘The value of creativity: implications for industrial design and design entrepreneurship’), Joyce Thomas (Beckman Institute of Design) and Lisa Canning (Arts Entrepreneurship) examine the role of entrepreneurship in industrial design and the lessons for the broader community of entrepreneurship educators. In recent years, design thinking – that has its roots in industrial design – has found wide acceptance among entrepreneurs and innovators in different fields including business, engineering, and sciences. Thomas and Canning explore the emerging topic of industrial design entrepreneurship and its implications for the broader field of arts entrepreneurship. They describe the different roles that industrial designers play in start-ups and then provide an extensive account, with examples, of promoting entrepreneurship education in industrial design schools.

In the final and concluding chapter, Chapter 10 (‘Towards a cross-disciplinary understanding of entrepreneurship’), I bring together the unique perspectives and insights on entrepreneurship from the different fields (as described in the various chapters) and offer a framework to advance a more cross-disciplinary understanding of entrepreneurship. The objective is to help develop (through future research and practice) a more comprehensive and coherent approach to entrepreneurship education in all fields – one that acknowledges the unique context of each field and at the same time draws on the strengths of various perspectives and approaches.

Our efforts at developing a broader view of entrepreneurship (in both education and practice) is very much a work in progress and we are probably only at the beginning stages. However, our success in fostering entrepreneurial thinking skills among all students – across all disciplines – will be contingent on us adopting such a broader perspective of
entrepreneurship. I hope that this book will help us take a first step in this direction.

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