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Doctoral Education in the Field of Entrepreneurship

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Current perceptions and practices in doctoral education in the field of entrepreneurship are explored. The paper developed from efforts of a Task Force formed by the Entrepreneurship Division of the Academy of Management in response to several important observations: growing demand for faculty in entrepreneurship, growing membership in the division, more participants in doctoral and junior faculty consortia, increasing attention to entrepreneurship education at all academic levels, and the implementation of more doctoral seminars and programs in the field. Using a process outlined in Summer et al. [J. Manage. 16 (1990) 361], the Task Force addressed the following questions: (1) What is the current state of doctoral education in entrepreneurship? (2) How should doctoral education in Entrepreneurship be designed? Recommendations are presented.

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Since the first known American entrepreneurship course was taught at Harvard University by Myles Mace in 1947, academic interest in entrepreneurship has grown to include more than 2200 courses offered at 1600 colleges and universities, 44 English-language refereed academic journals, 100+ entrepreneurship centers, 277 endowed positions, and over 1200 members in the Entrepreneurship Division of the Academy of Management (Academy of Management Entrepreneurship Division records; Katz, *in press*). While this is a substantial array of activities, there seems to be little intellectual cohesion among these efforts. We believe that improved development of doctoral programs will enhance coherence in scholarship, knowledge and practice within the field of entrepreneurship.

Only a small number of universities and colleges currently offer Ph.D. programs in entrepreneurship. Therefore, the majority of scholars who are currently active in the entrepreneurship field have a variety of disciplinary backgrounds. The increase in numbers of students and young faculty who are expressing interest in and commitment to the entrepreneurship field through their participation in doctoral and new faculty consortia is encouraging. Development of the entrepreneurship field as a scholarly domain has reached the stage that further expansion of doctoral programs in entrepreneurship is both possible and desirable, as greater availability of well-designed doctoral programs in entrepreneurship will better prepare those scholars for successful academic careers. This paper addresses this need by providing an assessment of current practices and perceptions of doctoral education in entrepreneurship, along with recommendations to guide the design of future entrepreneurship doctoral programs.

The paper is developed as follows. We describe briefly the philosophy and orientation of the entrepreneurship domain and offer a conceptual framework of that domain. We draw on survey data from two groups (deans of business schools and “young” (new) entrepreneurship scholars) whose perspectives and attitudes towards entrepreneurship and doctoral education are critical to understanding the educational preparation of entrepreneurship faculty. Considering the doctoral program design, we address both content and methods for entrepreneurship research, as well as options and pedagogies for teaching entrepreneurship. We offer recommendations for doctoral curriculum and program design, and for the professional development of faculty careers and roles.

The Domain of Entrepreneurship

A fundamental characteristic of the field of entrepreneurship and of its research is a focus on *creation* (of new ventures and organizations, new combinations of goods and services, etc.). Such creation might occur at multiple levels of analysis (individuals and teams, new ventures and organizations, etc.) and in a wide variety of contexts (new ventures and organizations, existing corporations, family businesses, franchises, etc.).

The entrepreneurship field’s focus on *creation* activities distinguishes it from perhaps its closest neighbor, the strategy field. For example, though new venture creation is viewed by strategy researchers as one among a number of strategic options for existing firms, entrepreneurial researchers’ primary focus is on new venture creation across a variety of contexts. Therefore, knowledge created in each field can offer insights for knowledge development in the other.

The relevance of entrepreneurship's research for the strategy field, and vice versa, is enhanced because similar to strategy, information technology, and to some degree marketing, entrepreneurship research can be characterized as multidisciplinary and applications-oriented, and because it considers multiple levels of analysis. Studying entrepreneurship processes requires an understanding of creation at the levels of the individual, team, organization, industry and community (Aldrich & Baker, 1997; Davidsson & Wiklund, 2001; Gartner, 2001; Harrison & Leitch, 1996). Entrepreneurship research thus includes the behaviors of individuals as they identify and create opportunities leading to the emergence and growth of an organization, and encompasses industry emergence, new venture team formation, wealth creation, and organizational transformation.

The domain statement we offer here encompasses key research topics in entrepreneurship, such as founding conditions and emergence (Aldrich, 1999); resource acquisition and development (Chrisman, Hofer & Bauerschmidt, 1998); entrepreneurial orientation (Covin, Slevin & Covin, 1990); venture capital investment (Bygrave & Timmons, 1992); international entrepreneurship (Oviatt & McDougall, 1994); opportunity recognition (Hills, Shrader & Lumpkin, 1999; Krueger, 2000); and franchisor development (Dant & Kauffman, 1998).

Defining the entrepreneurship domain by its focus on creation presents a unifying purpose for research, and satisfies the phenomenon's multi-level and multi-disciplinary features (Low, 2001). Figure 1 provides a visual interpretation of the entrepreneurship domain. In the figure, the domain is presented as a series of nested circles with the inner circle formed by *processes* associated with opportunity recognition, exploration and exploitation. These include the range of cognitive, strategic and other processes associated with scanning, identifying and exploring entrepreneurial opportunities, the expectations or aspirations about opportunities, and the perceptions of a firm's ability to exploit these opportunities. These processes reside within a *context*, which might be defined by level (e.g., individual, team, venture, corporation, community), type of business (family, corporate, franchise), or geographic location.

The outer circle reflects the *activities* leading to the creation of new combinations, new methods of production, new ventures, new industries, new markets, and new wealth. Activities leading to entrepreneurial creation are similarly wide-ranging (e.g., venture capital investing, social networking, resource investment, strategic planning, community development programs, team building, individual start up behaviors). The processes or activities can be examined using a variety of disciplinary lenses or theoretical perspectives. A list of representative readings with denotations referring to Figure 1 is provided in Appendix A; the list is intended to be illustrative rather than comprehensive.

Perspectives on Entrepreneurship and Doctoral Education

Despite significant growth in undergraduate and master's course offerings in entrepreneurship, few doctoral programs in entrepreneurship are available to prepare faculty for the field. An informal survey of the thirty-eight schools represented at the 1999 Entrepreneurship Division Executive Committee meeting revealed that seven schools used comprehensive exam questions on entrepreneurship but did not have formal courses or modules on

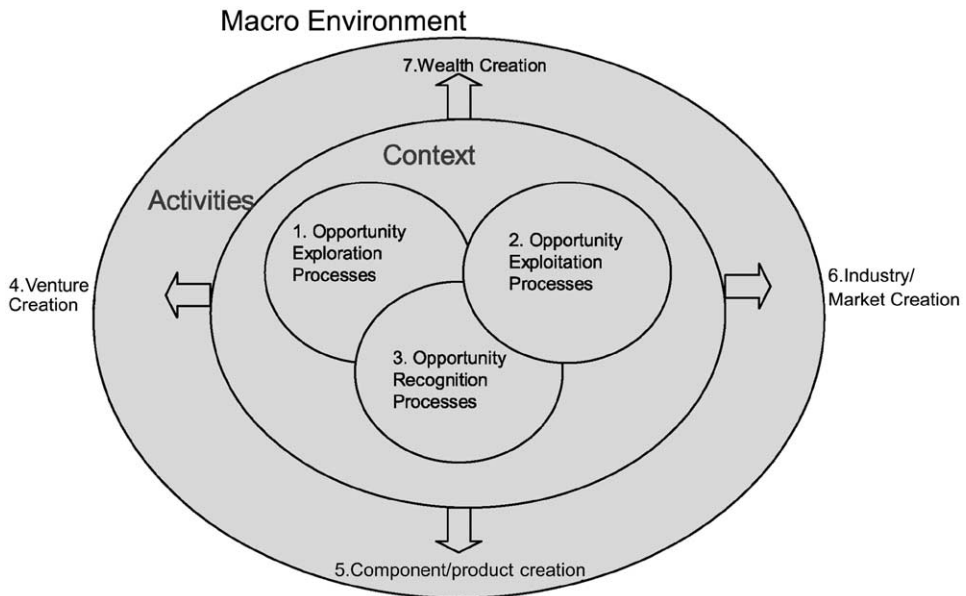


Figure 1. Entrepreneurship domain. (1) *Opportunity Exploration Processes*—learning strategies (Honig, 2001). (2) *Opportunity Exploitation Processes*—resource acquisition and development (Chrisman, Bauerschmidt & Hofer, 1998); growth intentions of entrepreneurs (Bird & Jelinek, 1988; Lau & Busenitz, 2001). (3) *Opportunity Recognition*—entrepreneurial orientation (Covin et al., 1990); opportunity recognition (Hills et al., 1999; Krueger, 2000). (4) *Venture Creation*—conditions and emergence (Aldrich, 1999), international entrepreneurship (Oviatt & McDougall, 1994); venture creation process (Bhave, 1994); start up sequences (Carter, Gartner & Reynolds, 1996); organizational founding (Baum & Oliver, 1992). (5) *Component/Product Creation*—effect of strategy on technology (Kelly & Rice, 2001); dominant design development (Abernathy & Utterback, 1982); innovations and technology discontinuities (Von Hippel, 1986). (6) *Industry/Market Creation*—franchisor development (Dant & Kauffman, 1998); informal venture capital market (Mason & Harrison, 1994); new industry emergence (Van de Ven & Garud, 1994). (7) *Wealth Creation*—venture capital investment and returns (Bygrave & Timmons, 1992); resources and firm performance (Brush & Chaganti, 1998; Chandler & Hanks, 1994); strategies and firm performance (Cooper, Willard & Woo, 1986; Covin et al., 1990); founding team strategy and growth (Eisenhardt & Schoonhoven, 1990).

entrepreneurship, five had entrepreneurship modules in core Ph.D. courses, ten offered doctoral seminars in entrepreneurship, and only one had a doctoral program in entrepreneurship. At most schools, these courses and programs were instituted in the last decade. As this small sample was composed of schools with at least one faculty member who was highly active in the Academy of Management's Entrepreneurship Division, it probably overstates the extent of doctoral offerings in entrepreneurship in the population of Ph.D.-granting universities.

Recent interest among entrepreneurship academics in formalization of doctoral education in entrepreneurship suggests some important questions: (1) How should doctoral programs in entrepreneurship be shaped to meet student needs and contribute to the developing legitimacy of entrepreneurship as a scholarly discipline? (2) Are recent graduates adequately prepared to assume leadership of research and teaching in entrepreneurship? (3) What

are young scholars' perceptions of the field of entrepreneurship, their role in business schools, and the nature and adequacy of their own training as preparation for those roles? (4) How do business school deans perceive the field of entrepreneurship? (5) What are those deans' expectations and intentions for entrepreneurship's role in their schools' curricula and faculty?

To answer these questions and provide effective recommendations, we first assessed the current state of doctoral education in entrepreneurship. In looking to the future, we also wanted to understand deans' visions and plans for entrepreneurship education in their institutions. To identify the strengths and weaknesses of current educational offerings, the educational backgrounds and experiences of faculty currently working in the entrepreneurship field, and the prevailing attitudes of business school deans and faculty about entrepreneurship doctoral education, we conducted surveys of business school deans and of young scholars in entrepreneurship. These surveys were designed to explore demand issues stemming from business schools' planned entrepreneurship activities at various educational levels, and deans' and young scholars' perceptions of the faculty qualifications needed to support this demand. The surveys were also designed to examine supply side issues such as intentions of schools to provide doctoral offerings, and perceptions of young scholars in entrepreneurship about doctoral education choices.

We surveyed the entire population of deans of accredited business schools (370) as along with a large number of young scholars (154) who have strong interests in entrepreneurship in the early stage of their careers. Although the complete population of young scholars cannot be fully identified, the sample used in this study of recent enrollees (5 years) in entrepreneurship doctoral consortia (Babson-Kauffman's and Academy of Management Entrepreneurship Division's) closely approximates and is representative of that population. Two mailings to deans in late 1999 produced a response rate of 53 percent, and two mailings to young scholars, also in late 1999, yielded a response rate of 56 percent. Consistent with the composition of the sample group, some of the respondents were currently enrolled, full-time doctoral students, others were in faculty positions elsewhere with "ABD" status, and some were untenured faculty members with recent degrees in hand. About 65 percent of the respondents with Ph.D.s were currently in their first faculty positions beyond their doctoral institutions, and respondents with degrees had held their positions on average between two and three years.

Adequacy of Existing Doctoral Programs

Reflecting the current popularity of entrepreneurship education in universities, 82 percent of responding deans reported that their schools offer entrepreneurship courses at the undergraduate level and 69 percent reported that such courses are offered at the master's level. Are current doctoral programs in entrepreneurship adequate in numbers, content and quality to meet these needs? Only a small percentage of respondents (8 percent) indicated that they offer entrepreneurship courses at the Ph.D. level, and only a few of the schools that do not offer Ph.D. courses in entrepreneurship reported offering entrepreneurship modules in other Ph.D. courses. [Table 1](#) shows the proportions of deans reporting course offerings at each level, and those deans' indications of the faculty positions (full-time or part-time, tenure track or non-tenure track) of those teaching entrepreneurship, by program level.

Table 1
Deans' responses to entrepreneurship survey

(A) Entrepreneurship course offerings and faculty members involved						
Program	Yes (%)	Faculty involved				
		FT tenure track (%)	FT non-tenure track (%)	Part-time/adjunct (%)	Doctoral students (%)	Other (%)
Under-graduate	82	80	30	45	6	2
Masters	69	85	27	38	0	1
Ph.D.	8	100	12	0	0	0

(B) Deans' commitments to and attitudes toward entrepreneurship		
	Mean	STD
Commitment to academic offerings in Entrepreneurship is increasing	3.93	1.1
Commitment to research in Entrepreneurship is increasing	3.58	1.1
Commitment to outreach offerings in Entrepreneurship to the community is increasing	3.77	1.0
Entrepreneurship research is rigorous	3.24	1.0
Entrepreneurship research is of high quality	3.29	1.0
Faculty could gain tenure here by publishing primarily in Entrepreneurship journals	3.66	1.2
The field of Entrepreneurship has a unique theoretical and scholarly domain	3.08	1.0
Specialized doctoral studies and research are required to be an Entrepreneurship scholar	2.75	1.1

Scale on which Deans indicated level of agreement with the above statements: 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, and 5: strongly agree.

Slightly over 11 percent of the young scholars received a Ph.D. with an official major or concentration in entrepreneurship and nearly 25 percent said they were currently enrolled in such a program. Of those *not* enrolled in or who had not graduated from an entrepreneurship doctoral program, only 10 percent reported that they had the opportunity to enroll in such a program. Sixty percent of the young scholars' doctoral institutions offered masters and/or doctoral courses on entrepreneurship topics. However, few doctoral courses were available, as 57 percent of those institutions offered no doctoral courses in entrepreneurship and another 18 percent offered only one doctoral course. Only four percent offered more than three doctoral courses in entrepreneurship.

New Entrepreneurship Faculty's Preparation, Roles, Attitudes

How well prepared are recent graduates to assume leadership of research and teaching in entrepreneurship? What is their perception of the field of entrepreneurship, their role in business schools, and the nature and adequacy of their own training as preparation for those roles? While 38 percent of respondents reported that they had taken doctoral seminars in entrepreneurship, 50 percent had taken only one such seminar. Having respondents from doctoral programs at European universities with different doctoral education approaches does not explain the low average number of doctoral seminars reported; the international respondents in our sample reported higher numbers of doctoral seminars available than did North American respondents. Despite the shortage of doctoral courses at most institutions, the majority of young entrepreneurship scholars (88 percent) indicated that their dissertations focused entirely or to a great extent on entrepreneurship, though most (64 percent) had their Ph.D. majors/concentrations in areas other than entrepreneurship.

The young scholars reported that the current institutions in which they serve as faculty members and teaching assistants emphasized research more than teaching or service in faculty evaluations (perceived emphasis on research averaged 44 percent while perceived emphasis on teaching averaged 35 percent, with the balance split between internal and external service). Young scholars reported teaching loads averaging four courses per year, which seems reasonable for new tenure-track faculty (as noted above, respondents with Ph.D.s averaged between two and three years beyond their doctoral programs). However, many young scholars (27 percent) reported having responsibility for their institutions' entrepreneurship centers, and about 35 percent were involved with such a center, yet only a few indicated that there was any reduction in their institutions' research expectations (7 percent) or teaching expectations (11 percent) in connection with their entrepreneurship center activities.

Finkle and Deeds (2001) found that almost all candidates seeking entrepreneurship positions were at the assistant professorship level whereas approximately one-third of the posted positions in entrepreneurship were for associate, full, endowed or open-level professor positions. The results of the survey of young scholars suggest that junior-level professors are filling this gap by undertaking entrepreneurship center and outreach duties. By contrast, junior scholars in other disciplines are not typically responsible for outreach or center activities, as more senior faculty are available to shoulder this responsibility. Outreach involvement jeopardizes junior entrepreneurship faculty members' progress on their research agendas, as well as the scholarly development and legitimacy of the entrepreneurship discipline. Therefore, we address this issue in our recommendations.

Deans' Attitudes and Intentions Toward Entrepreneurship

How do business school deans perceive the field of entrepreneurship? What are their expectations and intentions for entrepreneurship's role in their schools' curricula and faculty? Most deans reported that their schools' commitments to entrepreneurship academic offerings were increasing but fewer indicated increased commitment to entrepreneurship research (see Table 1). Deans' attitudes toward practical experience and business contacts as preparation for teaching entrepreneurship were more positive than their attitudes toward entrepreneurship research (see Table 1). It is interesting that deans rate more highly the likelihood of faculty receiving tenure at their schools by publishing primarily in entrepreneurship journals than their assessments of the quality and rigor of entrepreneurship research.

The deans' responses to questions regarding the centrality of entrepreneurship to the different program levels suggests that they view entrepreneurship to be most important at the undergraduate level and least important at the Ph.D. level. Deans perceive entrepreneurship to be increasing in importance more at the undergraduate level than at the graduate levels in their schools. This focus on undergraduates might provide an insight into the deans' understanding of the benefits that their school may gain by ties with practitioners. Possibly, deans recognize the value of internships and employment offers (for bachelors' graduates) more than they recognize the value of advice, mentoring, and private equity investments (for graduates and alumni).

Summary

The findings of the two surveys suggest that further development of quality doctoral programs for entrepreneurship is needed. Guided by the domain statement offered in this paper, the survey results, and the authors' experiences and deliberations, we present recommendations for faculty, doctoral students and educational institutions. We argue for a specific content and focus in a Ph.D. program in entrepreneurship, and suggest approaches that might be followed to achieve this in different institutional settings. The remainder of this paper addresses these issues.

Recommendations for Doctoral Programs in Entrepreneurship

Recommendation #1

Increase the availability of Ph.D. programs and concentrations in Entrepreneurship that are consistent with the domain statement and that provide rigorous theory, research and methodological training.

Our study shows that the rapid and sustained growth of universities' undergraduate and MBA offerings in entrepreneurship has far outstripped the supply of doctoral-trained entrepreneurship faculty available to deliver those programs and courses. Further, the cultural and structural context of entrepreneurship courses and programs is often quite different from other functional disciplines (e.g., accounting, marketing, operations). For example, at many schools, entrepreneurship courses and programs are related to or coexist with an

entrepreneurship center or institute responsible for offering new venture consulting, business plan competitions, workshops and community outreach.

Thus, the field of entrepreneurship and the educational institutions that employ entrepreneurship faculty and offer entrepreneurship courses and programs are facing simultaneously two competing demands: (1) the need to support further development of entrepreneurship as a scholarly domain, consistent with recent and planned growth in graduate educational offerings in entrepreneurship, and (2) the need to meet rapidly increasing demand for highly applied and practice-oriented undergraduate and non-credit educational offerings, and for institutional and faculty involvement in a variety of community outreach programs.

One alternative for meeting the demand for practice-oriented faculty to deliver pedagogical and outreach offerings would be to ensure that entrepreneurship doctoral programs emphasize the applied and practical pedagogies, content, skills and competencies needed for those outreach and teaching activities. This approach might provide benefits and value by increasing the supply of entrepreneurship-trained Ph.D. faculty capable of satisfying the second demand above. However, we believe that doctoral programs so designed would have low emphasis on scholarly research, theory and methodology, which are critical for academic legitimacy of the entrepreneurship research domain and for tenure-track faculty members' careers.

Therefore, we advocate that entrepreneurship doctoral programs focus on a rigorous discipline-based education that addresses the content of the domain outlined in [Figure 1](#) and that carefully develops students' knowledge and skills in theory and research methods, as is done in other disciplines. Of course, as in other disciplines, schools choosing to offer Ph.D. programs in entrepreneurship might specialize in particular research areas leading to unique positioning (e.g., innovation and opportunity exploration, international entrepreneurship).

Recommendation #2

At least three core courses can provide the foundation for doctoral education—a foundational entrepreneurship readings course that covers theory and research, a course based in economic approaches to entrepreneurship, and a course grounded in social science approaches to entrepreneurship.

Preparatory courses for a Ph.D. in entrepreneurship might vary depending on school resources, strategic focus and size of the doctoral program. Some programs will stress a strategic orientation (Meyer & Heppard, 2000), while others may stress an economic (Hebert & Link, 1982) or a sociological perspective ([Aldrich, 1999](#)). Given the multi-disciplinary nature of the field, such variation is welcome. However, we recommend the three core courses listed above to define the basic framework for a Ph.D. degree in entrepreneurship. This group of courses permits multi-level analyses and multi-disciplinary exploration of research topics and of methods appropriate to these streams of research. Brief descriptions of suggested courses follow, and lists of representative readings (including those referenced in this section) are found in [Appendix B](#).

Foundational entrepreneurship course. The foundational entrepreneurship course would focus on creation processes and models. It would provide an overview of perspectives,

theory, and the breadth and scope of the field, including early works from psychology, business history, sociology, and economic development. For example, the course might include books by Bird (1989), Collins and Moore (1979), Kent, Sexton and Vesper (1982), Kirzner (1973), McClelland (1961), Schumpeter (1934), and Vesper (1990) as well as classic articles. These classic readings might be complemented by more recent works such as Aldrich (1999), Hitt, Ireland, Camp and Sexton (2002), McGrath and MacMillan (2000), Miner (1996), Schoonhoven and Romanelli (2001) and Shane, Arrow, Casson and Drucker (2002). Scholarly papers and books of wide-ranging, integrative theory could be included to address the varieties of creation contexts (individuals, groups, organizations, societies) and processes (opportunity recognition, planning, the creative act, variation, selection, retention). Given a large body of material from contributing disciplines (e.g., sociology, economics, psychology), management fields (e.g., strategy, finance, marketing), and a growing body of substantive research and theory uniquely applicable to entrepreneurship, such a foundational course might be designed to cover two semesters. At a minimum, any doctoral student receiving a Ph.D. in entrepreneurship should cover this basic foundational material. Such a foundational course might also be offered at schools that do not have an entrepreneurship Ph.D. program, or parts of the course might be used as modules in those schools' doctoral courses.

Economics perspectives course in entrepreneurship. A course providing an economics perspective would address opportunity exploration, recognition and exploitation processes largely from the lens of Austrian economics. For instance, concepts such as “alertness” (Kirzner, 1973), “discovery” (Hayek, 1945) or “gap filling” (Liebenstein, 1968) might be examined relative to discovery and exploitation of opportunities (Shane & Venkataraman, 2000). Other topics of interest are Schumpeterian theory on creative destruction (Kirchhoff, 1994; Schumpeter, 1934), the role of information and knowledge as a source of opportunity (Hayek, 1945), technological change and innovation (Acs & Audretsch, 1993), theory of entrepreneurial growth (Penrose, 1959) and strategic approaches to entrepreneurial entry (Hoskisson & Busenitz, 2002). Additionally, the course might include new venture strategies (Carter, Stearns & Reynolds, 1994; McDougall, Covin, Robinson & Herron, 1994), venture capital (Bygrave & Timmons, 1992); international entrepreneurship (McDougall & Oviatt, 2000; Oviatt & McDougall, 1994) and creation of inter-firm networks and alliances (Cooper, 2002; Hagedoorn, 1995).

Social science perspectives course in entrepreneurship. A course presenting the social science perspective might cover opportunity exploration, recognition and exploitation using psychology, business history or sociological lenses. For instance, idea generation (Vesper, 1990), organizational creation (Gartner, 2001), activities of nascent entrepreneurs (Reynolds, 2000), evolution of new organizations and populations (Aldrich, 1999) should be examined in this course. Other topics of interest are cognitive psychology approaches to entrepreneurial activity (Shaver & Scott, 1991), social network development and influence on venture creation (Larson, 1992), opportunity framing (Tversky & Khaneman, 1981) and environmental influences on entrepreneurship (Van de Ven, Hudson & Schroeder, 1984). Other topics might include entrepreneurial human capital (Cooper & Gimeno-Gascon, 1992), women's entrepreneurship (Brush, 1992), family business, (Upton & Heck, 1997),

entrepreneurial vision (Bird, 1989), ethnic entrepreneurship (Butler & Greene, 1997) or psychological aspects of entrepreneurial development (Kets de Vries & Zaleznik, 1977; Miner, 1996).

While not all institutions will have the resources to offer three such courses, there are opportunities for collaboration across university or school departments (e.g., economics and management, sociology and management), and across universities within the same city that might have management specializations in different areas (e.g., organizational behavior and business economics). Alternatively, students may pursue an independent study to fulfill one of these course requirements.

Recommendation #3

Entrepreneurship doctoral students need a broad understanding of the variety of research designs, sampling criteria, data collection methods and analytical techniques which might be used to address research questions about creation of new ventures, new organizations, new combinations and the like. Since 1990, entrepreneurship research has grown exponentially in terms of research studies, conference papers and journal articles (Busenitz et al., 2003). Six trends are apparent:

1. The vast majority of research published between 1994 and 1998 was empirical (82 percent) rather than theoretical (18 percent) (Aldrich & Baker, 1997; Chandler & Lyon, 2001). During this same time frame the theoretical basis of empirical work was primarily from the field of strategy, as 64 percent of the articles had a strategy focus and 57 percent studied the firm as unit of analysis.
2. Because entrepreneurship research addresses a broad scope of questions, the populations of interest and research samples also tend to be wide-ranging (e.g., family businesses, angel investors, international entrepreneurs, corporate ventures, non-profit start-ups, small firms, new industries and franchise systems) (Davidsson & Wiklund, 2001). The range of populations and the lack of appropriate publicly available data sets have resulted in a proliferation of heterogeneous samples and data, making it more difficult to compare populations on similar dimensions. Less than 10 percent of entrepreneurship articles use publicly available data, fewer employ ethnographic approaches, and no simulation studies on entrepreneurial topics were published up to 1994 (Aldrich & Baker, 1997). A more recent study found that 70 percent of entrepreneurship papers were empirical, and 31 percent used secondary data (Chandler & Lyon, 2001). In comparison, strategic and general management studies frequently use publicly available data sets (43 percent), and a few use simulation (8 percent) and ethnographic (3 percent) methods (Aldrich & Baker, 1997). Longitudinally designed studies are infrequently used in entrepreneurship; rather, a strong emphasis is on cross-sectional designs (Aldrich & Martinez, 2001).
3. Surveys are the most prominent method of research, consistent with research in general management publications (e.g., *Administrative Science Quarterly* and *Academy of Management Journal*). One study showed 66 percent of entrepreneurship research used surveys, with 25 percent using interview methods (Chandler & Lyon, 2001). Another summary found 77 percent of Babson-Kauffman Research Conference Papers

and 48 percent of the papers in top entrepreneurship journals (*Entrepreneurship Theory and Practice* and *Journal of Business Venturing*) relied on survey methods (Aldrich & Baker, 1997).

4. Low response rates (averaging 33 percent) for surveys of cross-sectional samples are problematic and limit generalizability of entrepreneurship research results (Chandler & Lyon, 2001). As a consequence, many entrepreneurship researchers have relied on convenience samples. The involvement of entrepreneurship scholars as center directors, as consultants, and in public policy efforts, has also reinforced opportunistic data collection of convenience samples such as entrepreneurs contacted at meetings, or through associations or networking.
5. New research initiatives, such as the National Panel Study of Business Start-ups (now Panel Study of Entrepreneurial Dynamics, PSED) are providing longitudinal data about nascent entrepreneurs, the process of start-up, their ventures and factors affecting their survival and growth. (See Reynolds, 2000, for a complete description of this project, the researchers involved, data sets, measures, and research progress.)
6. Although new software packages featuring sophisticated statistical techniques are more widely available, the use of multivariate analyses (e.g., regressions, discriminant analysis) in published entrepreneurship articles is comparatively low (Chandler & Lyon, 2001), averaging about 25 percent vs. nearly 50 percent in major management journals (Aldrich & Baker, 1997). Use of structural equation modeling is increasing, and qualitative studies seem to be gaining popularity, with more attention recently to ethnographic methods, comparative cases, and in-depth interviews (but see Aldrich, 1999, p. 57).

These trends in research design, sample selection and analytical techniques suggest certain recommendations for doctoral student education. As noted by Aldrich and Baker (1997), Chandler and Lyon (2001) and Davidsson and Wiklund (2001), unidentified sampling frames, the use of heterogeneous populations, lack of reliability and validity testing, poor conceptualization with a lack of theoretical fit, and unclear or unstated hypotheses are all problems associated with insufficient training in normal science methods (Kuhn, 1970). In addition, the entrepreneurship domain's characteristics of applied research, multi-disciplinary approaches and multiple units of analyses, and the content focus on creation, suggests that doctoral students should be especially well trained to understand research design issues. For example, the choice of probability vs. non-probability sampling should be carefully evaluated for trade-offs that may occur due to difficulties in identifying a particular population (e.g., nascent entrepreneurs), as well as resource constraints involved in the process. If primary data collection is the best option when secondary data sets are unavailable, extra attention should be given to testing reliability of measures, sample size, statistical power and response rates, to maintain rigor in research (Aldrich & Baker, 1997; Chandler & Lyon, 2001). Students should be carefully instructed in all aspects of research design, including the trade-offs associated with sampling, methods choices, and primary rather than secondary data collection, and should be well versed on both qualitative and quantitative techniques.

Because the entrepreneurship domain is not fully developed, qualitative methods can help researchers build grounded theory from which to develop a paradigm (Glaser & Strauss,

1967; Stewart, 1998). Additionally, research techniques and methods can be learned and applied from courses in other disciplines (e.g., sociology, education, anthropology). Similarly, doctoral students' grounding in basic quantitative techniques provides an essential foundation for understanding research to date, and for designing and engaging in high quality research. Quantitative techniques such as simulation modeling and structural equation modeling may hold promise for understanding aspects of entrepreneurial creation, cognition and opportunity recognition.

In summary, doctoral student education must be designed to overcome the limitations of past research, and at the same time, prepare students to rigorously study determinants of creation, opportunity recognition, exploration and the exploitation of these opportunities, as well as the outcomes of these processes.

Recommendation #4

Young entrepreneurship scholars should target their research for the top scholarly journals in the broader management field, in addition to publishing in specialized entrepreneurship journals.

While new Ph.D.'s in entrepreneurship have career choices, we recommend that young scholars choosing to follow the tenure track research path should publish their work in top tier journals in both entrepreneurship and general management. As noted by Busenitz et al. (2003), entrepreneurship scholars need to increase exchanges of knowledge within the entrepreneurship field as well as the exchanges between entrepreneurship scholars and the broader academic community. To this end, it is important that doctoral students and new faculty publish in entrepreneurship journals, where the knowledge base of the field can be continuously developed, tested and advanced. In addition, by publishing their work in the top tier general management journals, young scholars as future leaders of the entrepreneurship domain can engage in the broader management scholarly conversation, reaching scholars outside the entrepreneurship domain to examine the intellectual boundaries of fields, articulate the unique aspects of entrepreneurship, and share intellectual developments that might advance knowledge in other management disciplines. This dual publishing strategy will serve to expand and build the knowledge base of the field, to build legitimacy of entrepreneurship as a scholarly domain, and to enhance young scholars' likelihood of career success, including earning tenure at their institutions.

Recommendation #5

Increase the availability of degree programs that prepare students for non-research-oriented careers.

A unique opportunity for students pursuing doctorates or perhaps master's degrees in entrepreneurship is the variety of career positions possible. Some students may be interested in careers outside the traditional, research-oriented academic positions, and entrepreneurship offers a variety of opportunities such as director of a Small Business Development Center, public policy or small business analyst in a government program, or academic positions at purely teaching-oriented schools. Other alternatives include positions with venture capital firms, consulting firms focused on start-ups, banks, and training providers (virtual and

conventional). Globally there are programs in micro-finance, technology development and diffusion, economic development and community development for which a doctorate in entrepreneurship provides an excellent qualification.

All these career objectives can be served by a doctoral program emphasizing scholarly research foundations. However, the existence of students whose primary career objective is other than research, taken together with the entrepreneurship fields' need for the talents of such individuals, represents an opportunity for some schools to offer alternative degrees that are less research-oriented and more practice-based. For instance, a program offering a DBA or Doctorate in Management providing students research skills and a theoretical foundation in an accelerated part-time or non-residence alternative could be attractive. Such degree programs could recognize entrepreneurial experience, and provide training on pedagogy, theory and course development to better prepare faculty who choose not to pursue research-oriented tenure-track positions. Alternatively, other types of doctoral programs (for instance, a Ph.D. in educational administration) or Master's in Entrepreneurship programs might create electives in entrepreneurship education and train directors for the more than 100 US centers of entrepreneurship and family business.

Recommendation #6

Outreach activities and entrepreneurship center involvement activities should be conducted by tenured senior faculty and/or clinical or adjunct faculty, rather than by untenured assistant professors or doctoral students.

Faculty, regardless of discipline, engage in three roles—teaching, research and service (TRS). The mix of these roles differs depending on the type of institution (e.g., research vs. teaching), developmental stage of the faculty position (untenured assistant professor, associate, full, endowed), and other factors. These lead to different requirements for faculty time commitment.

From an institution's administrative perspective, center activities and outreach are important for connecting the school to the community through assistance to entrepreneurs and programs such as business plan competitions, and for fundraising. In contrast, a focus on research is particularly important for young entrepreneurship scholars, and teaching is also more important than service for tenure. There is a clear danger that work with entrepreneurship centers will decrease the time and energy untenured assistant professors are able to devote to research, especially if their teaching loads are not reduced to offset time spent on entrepreneurship centers' activities. The combination of entrepreneurship center and teaching workload assigned to new faculty by many universities disadvantage those young scholars compared to their counterparts in other disciplines, may reduce those young scholars' ability to gain tenure, and ultimately reduce their contributions to development of the entrepreneurship field as a scholarly discipline. The nature of this trade-off between the scholarly benefits of entrepreneurship research and the institutional benefits of entrepreneurial development activities is more distinct and pronounced in this field than in other disciplines. For junior faculty, this dilemma is exacerbated by the small number of senior faculty in the entrepreneurship field.

For doctoral students and junior faculty in entrepreneurship to be effective in their future roles as academics and for the field of entrepreneurship to progress, they must be protected

during the early years of their careers, so that they can focus on scholarly contributions and on developing their research agendas, as is the case in other disciplines. Importantly, they should be socialized into the graduate student role and, almost simultaneously, into the professional specialty (Boyle & Boice, 1998; Schwartz & Tickamyer, 1999; Steen, Bader & Kubrin, 1999). Successful socialization results from peer interactions and program design (e.g., timely feedback). It also results from informal socializing with faculty and from interaction with faculty members (Boyle & Boice, 1998). Doctoral students and junior faculty in entrepreneurship may face more difficulties in the socialization process than students from other disciplines because of perceptions that entrepreneurship lacks legitimacy as a research domain, or that entrepreneurship research is largely applied in nature. In schools with new doctoral programs in entrepreneurship, faculty must take special care to nurture and socialize doctoral students into the field.

As new faculty become established, they must learn to deal with basic student populations as well as entrepreneurs, prospective entrepreneurs, and members of the larger community who come to the faculty and to entrepreneurship centers for help in developing entrepreneurial initiatives outside academe. At the appropriate point in their careers (nearing and following tenure), we recommend that young scholars in entrepreneurship take advantage of professional development workshops or other opportunities to gain practical experience, as suggested in the next recommendation.

Recommendation #7

Expand professional development workshops for entrepreneurship pedagogy and outreach.

As noted at the beginning of this paper, the growth in MBA, undergraduate, executive MBA program demand for entrepreneurship required and elective courses to be offered in turn creates demand for qualified entrepreneurship teachers. We have argued that a Ph.D. in entrepreneurship should be primarily a research degree, as opposed to applied entrepreneurship content (e.g., business plan preparation, experience in starting a business, venture capital valuation) and pedagogy for teaching the wide range of applied entrepreneurship courses that faculty are expected to deliver during their careers. We do not recommend these activities be part of degree programs for Ph.D.'s in entrepreneurship because the doctoral program focus should be on developing scholarly research skills and knowledge. Instead, we recommend an expansion of professional development workshops that can provide the training needed to prepare doctoral students, junior faculty, clinical faculty or even faculty transferring from a different disciplinary department for teaching entrepreneurship courses. The need for professional development workshops offers opportunities for schools, other organizations or foundations to develop such workshops. For example, the Price-Babson College Fellows Program and LLEEP (Lifelong Learning for Entrepreneurship Education Professionals) workshops provided by Babson College that train practitioners and academics in entrepreneurship education and pedagogy might be appropriate vehicles for this training.

Professional development workshops might include two major emphases: (1) methods related to increasing the *effectiveness* of creation processes at all levels of society, and (2) pedagogy. The methods content might include the roles of systemic conditions (taken from

ecology and development economics), cultural milieus (from sociology and organizational theory), and approaches to creation (which have been developed largely in entrepreneurship and development economics). Contextual differences such as corporate, family, and internationalized ventures, and differences across populations (e.g., women, minorities, and immigrants) could be explored. Perspectives of individuals, teams, organizations and public policy would be included. A substantial component of the workshop should involve learning the underlying theory and applied practice skills for facilitating the creation and support of entrepreneurship; it would include the most distinctive institutional creation of contemporary entrepreneurship theory, the business plan, but also other forms of consulting on creation efforts, along with program and incentive development. Sessions on teaching entrepreneurial cases and entrepreneurial experiential exercises, developing courses and curricula, performing service activities, and advising student activities should be included.

While there are books that describe the basic pedagogical techniques for teaching assistants such as lectures, handouts, and overheads, there are many more techniques which should be included in teaching instruction (Nyquist & Sprague, 1998). There are two long-standing research and publication streams presenting pedagogical techniques in entrepreneurship education: (1) a series of national surveys on small business and entrepreneurship education (www.nationalsurvey.org), sponsored by the US Small Business Administration (Winslow, Solomon & Tarabishy, 1999), and (2) a series of studies of entrepreneurship education (Vesper, 1993; Vesper & Gartner, 1997).

Over the course of their careers, entrepreneurship faculty need to be able to teach, consult, and work with students and the general public, including entrepreneurs, prospective entrepreneurs outside academe, and individuals from government and commercial organizations with interests in entrepreneurship and economic development. Professional development workshops at the appropriate career stage can develop faculty skills for productive interactions with and service to these constituencies. Such workshops should include supervised experiences in developing, presenting and applying business plans, grants, and consulting projects tied to entrepreneurial development, in order to gain the insights and experiences necessary to work with the diverse publics of the entrepreneurship field. Techniques might include cross-disciplinary advising and coursework, soliciting mentoring and sponsor help outside the home university, perhaps via the Internet or social networks, and providing institutional supports for unusual but promising forms of specialization.

Conclusion

Entrepreneurship has embraced the research-based model as the major determinant for achieving legitimacy in the eyes of other, more established, disciplines. This places doctoral education in entrepreneurship at the nexus of a set of complex, sometimes contradictory, institutional forces. It is only through the development of Ph.D.-trained academics that entrepreneurship can achieve acceptance as an intellectually substantive and rigorous discipline, because the research training and academic placement of entrepreneurship doctoral students will drive the next generation of breakthrough research.

Therefore, entrepreneurship doctoral education is developing under pressures for increased research emphasis and research rigor, though this development work faces

countervailing forces from traditional disciplines, in which efforts are underway to revise the traditional approach to doctoral pedagogy. (For more information on these reform efforts, many of which are backed by foundations or professional associations, see <http://depts.washington.edu/envision/projects.html>.) The natural strengths of entrepreneurship education—its inherent bridging of town and gown, its cross-level focus, its multi-disciplinary basis, its expectation that graduates be involved in the longer term in business, government and academe, and its institutional foundation in teaching—represent in many ways the type of doctoral teaching situations to which the contemporary doctoral education reformers aspire in their efforts to modify, broaden and humanize doctoral education in their disciplines.

The field of entrepreneurship is at an important crossroads, facing the challenge of designing doctoral curricula to advance scholarship in the field and prepare young scholars to be successful contributors to that advancement, while leveraging the field's hard-won position as a discipline rooted in teaching, and in reaching out to businesses and communities. This paper addresses these competing challenges by presenting a domain statement reflecting the perspectives of entrepreneurship scholars, describing methods for studying this domain, identifying curricula for the development of doctoral students, suggesting how entrepreneurship doctoral programs might be organized, and offering recommendations for programs designed to develop entrepreneurship faculty's pedagogical and outreach skills to best fulfill their roles at different career stages. We believe that the innovative approach offered here can help institutions to meet the competing demands they face, and serve as a model for future doctoral programs in other disciplines.

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Appendix A. Representative Readings for Entrepreneurship Domain (Numbered Denotations Refer to Sections of Figure 1)

Abernathy, W. J., & Utterback, J. M. 1982. Patterns of industrial innovation. In M. L. Tushman & W. L. Moore (Eds.), *Readings in the management of innovation*: 97–108. Cambridge, MA: Ballinger. [5]

Aldrich, H. 1999. *Organizations evolving*. Thousand Oaks, CA: Sage. [4]

Baum, J., & Oliver, C. 1992. Institutional embeddedness and the dynamics of organizational populations. *American Sociological Review*, 57(4): 540–559. [4]

Bird, B., & Jelinek, M. 1988. The operation of entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 13(2): 21–29. [2]

Bhave, M. P. 1994. A process model of entrepreneurial venture creation. *Journal of Business Venturing*, 9(3): 223–242. [4]

Brush, C. G., & Chaganti, R. 1998. Businesses without glamour: An analysis of resources on performance by size and age in small service and retail firms. *Journal of Business Venturing*, 14(3): 233–257. [7]

Bygrave, W., & Timmons, J. 1992. *Venture capital at the crossroads*. Cambridge, MA: Harvard Business School Press. [7]

Carter, N. M., Gartner, W. B., & Reynolds, P. D. 1996. Exploring start-up sequences. *Journal of Business Venturing*, 11(3): 151–166. [4]

Chandler, G. N., & Hanks, S. H. 1994. Market attractiveness, resource-based capabilities, venture strategies, and venture performance. *Journal of Business Venturing*, 9(4): 331–349. [7]

Chrisman, J., Bauerschmidt, A., & Hofer, C. 1998. The determinants of new venture performance: An extended model. *Entrepreneurship Theory and Practice*, 23(1): 5–30. [2]

Cooper, A. C., Willard, G., & Woo, C. 1986. Strategies for high-performing new and small firms: A re-examination of the niche concept. *Journal of Business Venturing*, 1(3): 247–260. [7]

Covin, J. G., Slevin, D. P., & Covin, T. J. 1990. Content and performance of growth seeking strategies: A comparison of small firms in high and low technology industries. *Journal of Business Venturing*, 5(6): 391–412. [3, 7]

Dant, R., & Kauffman, P. 1998. Introduction to the special issue on franchising. *Journal of Business Venturing*, 13(1): 1–3. [6]

Eisenhardt, K. M., & Schoonhoven, C. B. 1990. Organizational growth: Linking founding team, strategy, environment and growth among U.S. semiconductor firms, 1978–1988. *Administrative Science Quarterly*, 35(3): 504–529. [7]

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Honig, B. 2001. Learning strategies and resources for entrepreneurs and entrepreneurs. *Entrepreneurship Theory and Practice*, 26(1): 21–26. [1]

Krueger, N. 2000. The cognitive infrastructure of opportunity emergence. *Entrepreneurship Theory and Practice*, 24(3): 5–23. [3]

Kelly, D., & Rice, M. 2001. Technology-based strategic actions in new firms: The influence of founding technology resources. *Entrepreneurship Theory and Practice*, 26(1): 55–74. [5]

Lau, C. M., & Busenitz, L. 2001. Growth intentions of entrepreneurs in a transitional economy: The People's Republic of China. *Entrepreneurship Theory and Practice*, 26(1): 5–20. [2]

Mason, C., & Harrison, R. 1994. The informal venture capital market in the U.K. In A. Hughes & D. J. Storey (Eds.), *Financing small firms*: 64–111. London: Routledge. [6]

Oviatt, B., & McDougall, P. P. 1994. Toward a theory of international new ventures. *Journal of International Business Studies*, 25(1): 45–63. [4]

Van de Ven, A., & Garud, R. 1994. The coevolution of technical and institutional events in the development of an innovation. In J. A. C. Baum & J. V. Singh (Eds.), *Evolutionary dynamics of organizations*: 425–443. New York: Oxford University Press. [6]

Von Hippel, E. 1986. Lead users: A source of novel product concepts. *Management Science*, 32(7): 791–805. [5]

Appendix B. Representative Readings for Doctoral Seminars

Foundational Entrepreneurship Course

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- Bird, B. J. 1989. *Entrepreneurial behavior*. Glenview, IL: Scott Foresman.
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- Kent, C., Sexton, D., & Vesper, K. 1982. *The encyclopedia of entrepreneurship*. Englewood Cliffs, NJ: Prentice Hall.
- Kirzner, I. M. 1973. *Competition and entrepreneurship*. Chicago: University of Chicago Press.
- McClelland, D. C. 1961. *The achieving society*. Princeton, NJ: Van Nostrand.
- McGrath, R. G., & MacMillan, I. 2000. *The entrepreneurial mindset*. Boston: Harvard Business School Press.
- Meyer, D., & Heppard, K. 2000. *Entrepreneurship as strategy*. Thousand Oaks, CA: Sage.
- Miner, J. B. 1996. *The four routes to entrepreneurial success*. San Francisco, CA: Berrett-Koehler Publishers.
- Schoonhoven, C. B., & Romanelli, E. (Eds.). 2001. *The entrepreneurship dynamic*. Stanford, CA: Stanford University Press.
- Schumpeter, J. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Shane, S., Arrow, K., Casson, M., & Drucker, P. (Eds.). 2002. *The foundations of entrepreneurship*. New York: Elgar Publishing.
- Vesper, K. 1990. *New venture strategies*. Englewood Cliffs, NJ: Prentice-Hall.

Economics Perspectives Course

- Acs, Z. J., & Audretsch, D. B. 1993. Innovation and technological change: The new learning. In G. Libecap (Ed.), *Advances in the study of entrepreneurship, innovation and economic growth*: Vol. 6, 109–142. Greenwich, CT: JAI.
- Bygrave, W., & Timmons, J. 1992. *Venture capital at the crossroads*. Cambridge, MA: Harvard Business School Press.
- Carter, N. M., Stearns, T., & Reynolds, P. D. 1994. New venture strategies: Theory development with an empirical base. *Strategic Management Journal*, 15(1): 21–42.
- Cooper, A. C. 2002. Networks, alliance and entrepreneurship. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new integrated mindset*: 203–222. Oxford, UK: Blackwell.
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Hoskisson, R. E., & Busenitz, L. W. 2002. Market uncertainty and learning distance in corporate entrepreneurship entry mode choice. In M. A. Hitt, R. D. Ireland, S. M. Camp, & D. L. Sexton (Eds.), *Strategic entrepreneurship: Creating a new integrated mindset*: 151–166. Oxford, UK: Blackwell Publishing.

Kirchhoff, B. A. 1994. *Entrepreneurship and dynamic capitalism: The economics of business firm formation and growth*. Westport, CT: Praeger.

Kirzner, I. M. 1973. *Competition and entrepreneurship*. Chicago: University of Chicago Press.

Liebenstein, H. 1968. Entrepreneurship and development. *American Economic Review*, LLVIII(2): 72–83.

McDougall, P., Covin, J., Robinson, R., & Herron, L. 1994. The effects of industry growth and strategic breadth on new venture performance and strategy content. *Strategic Management Journal*, 15(7): 537–554.

McDougall, P., & Oviatt, B. M. 2000. International entrepreneurship: The intersection of two research paths. *Academy of Management Journal*, 43(5): 902–908.

Oviatt, B., & McDougall, P. 1994. Toward a theory of international new ventures. *Journal of International Business Studies*, 25(1): 45–64.

Penrose, E. 1959. *Theory of the growth of the firm*. Oxford: Oxford University Press.

Schumpeter, J. 1934. *The theory of economic development*. Cambridge, MA: Harvard University Press.

Shane, S., & Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1): 217–226.

Social Sciences Perspective Course

Aldrich, H. 1999. *Organizations evolving*. Thousand Oaks, CA: Sage.

Bird, B. J. 1989. *Entrepreneurial behavior*. Glenview, IL: Scott Foresman

Brush, C. G. 1992. Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship Theory and Practice*, 16(4): 5–30.

Butler, J. S., & Greene, P. G. 1997. Ethnic entrepreneurship: The continuous rebirth of American enterprise. In D. L. Sexton & R. Smilor (Eds.), *Entrepreneurship 2000*: 267–289. Chicago, IL: Upstart Publishing.

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Gartner, W. B. 2001. Is there an elephant in entrepreneurship? Blind assumptions in theory development. *Entrepreneurship Theory and Practice*, 25(4): 27–40.

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