The Growth and Advancement of Entrepreneurship in Higher Education:

An Environmental Scan of College Initiatives

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Section I: Students

Entrepreneurship and the Higher Education Curriculum

Introduction

In this past decade, the field of entrepreneurship has become an accepted part of higher education curriculum across the United States. And, like every successful curriculum, the quality of any entrepreneurship program must be measured in part by how it meets the needs of students.

For our purpose - identifying changes in entrepreneurship-related curriculum in an effort to better direct Kauffman Center efforts - this first section looks at higher education curriculum in terms of this key audience: students.

Indeed, colleges and universities have produced a proliferation of entrepreneurship courses, programs, clubs and centers directed at students, their needs and expectations as well as their future success.

The growth in programs really took off in the early 1990s (Gartner, Vesper 1999). Now, more than 1,500 colleges and universities offer some form of entrepreneurship training (Charney, Libecap, 2000). In 1995, an estimated 400 colleges and universities offered entrepreneurship courses (Vesper, Gartner 1997), rising from the base of 16 or so offering courses in 1970.

Both the numbers of courses and student enrollment in entrepreneurship classes and programs have increased since the early 1990s, and the number of intercollegiate business plan competitions and other contests is also on the rise.

Also, new entrepreneurship curriculum is being created in business and nonbusiness schools, as offerings expand to include marketing, finance, competitive analysis, new product development and technology, in business schools and in non-business areas of study.

One recent study indicates the dramatic impact that higher education entrepreneurship programs have on students, on funding to universities and colleges, and to innovation.

In their "Impact of Entrepreneurship Education," Alberta Charney and Gary Libecap concluded that entrepreneurship education helps produce self-sufficient enterprising individuals, successful business leaders...
and champions of innovation. Their findings were based on a comparison of University of Arizona Berger Entrepreneurship Program graduates to other University of Arizona business school graduates.

The authors also found that the university received more outside funding - nearly $12 million - due to the existence and activities of the entrepreneurship program.

More than 550 universities are actively involved in entrepreneurship courses, creating the fastest growing academic area in the history of business schools (Donald Kuratko, Midwest Entrepreneurial Education Center). These numbers indicate increases in those areas since 1991, when an estimated 369 schools offered entrepreneurship courses. (Gartner, Vesper 1994)

Courses are no longer being offered only in business schools or at the graduate level.

Of the 104 major entrepreneurship programs studied in a report by Karl Vesper and William Gartner (University Entrepreneurship Programs, 1999), an estimated 55 percent were both undergraduate and graduate based, 30 percent were graduate only and 15 percent were undergraduate only.

The trend to add or expand entrepreneurial programs is affecting both major universities and regional, smaller schools. For example, the Columbia Business School in New York formally established its entrepreneurship program in 1995, and Black Hills State University's College of Business and Technology in Spearfish, S.D., began offering a major in entrepreneurial studies to its undergraduate students in fall 1998.

An important study surveying entrepreneurship courses and programs at colleges and universities indicates more and more schools are offering entrepreneurship as a degree and field of concentration.

The 1999-2000 National Entrepreneurship Survey conducted by The George Washington University's School of Business and Public Management for the seventh consecutive year (Window, Solomon) showed that 142 undergraduate and graduate schools offer entrepreneurship as an area of concentration and 49 schools offer an entrepreneurship degree.

This compares to the previous, 1997 study by Dr. Erik Winslow and Dr. George Solomon that showed that 78 schools offered entrepreneurship as an area of concentration, and 32 offered entrepreneurship as a degree. In 1994, research by Gartner and Vesper showed only 50 universities offering concentrations, majors or degrees in entrepreneurship.

**Experiential Learning**

It's important to note the shift from traditional paradigms to more unconventional, experiential based teaching of entrepreneurship at the university level.

Experiential learning has risen to the forefront of entrepreneurship education, as colleges and universities respond to research that encourages both real-world projects and extracurricular learning activities to better teach entrepreneurship, such as internships, business plan competitions and student clubs.

**Internships**

This past decade has seen a dramatic rise in the number of internships offered by universities and colleges in entrepreneurship programs.
An estimated 110 colleges and universities are offering entrepreneurship internship programs (Entreworld.com).

KCEL has seen increased interest and expansion in its internship program, Kauffman Entrepreneur Internship Program (KEIP), rising from 396 interns and 26 colleges when it started in 1996 to an estimated 1,500 interns in 91 colleges and universities this year.

In five years of operation, an estimated 4,000 interns have gone through the KEIP, and 110 institutions have received KEIP grants. Importantly, 80 percent have been able to sustain their programs after KEIP funding.

Business plan competitions

Participation in business plan competitions is more prevalent today than before 1992, when only a handful of schools participated in business plan competitions. Student competitions have become very important, offering incentives in the form of prize money and often the opportunity for students to get financing for their plans.

The 1999-2000 National Entrepreneurship Survey showed that nearly half of those schools surveyed (42 percent) participate in business plan competitions. That's up from the 1997 survey, which indicated 30 percent participation.

Many schools offer internal business plan competitions as part of their entrepreneurship programs, while some expand participation with regional, national and international competitions.

There are several national business plan competitions, including undergraduate contests at Ball State University and Miami University of Ohio, and graduate-level competitions at the University of Oregon and University of Nebraska at Lincoln. University of Georgia is among the schools that have a regional competition, and the University of Texas and San Diego State run international business plan competitions.

Among the newest (and unique) competitions is the Babcock/Eno River Capital Elevator Competition, to be held this spring in Winston-Salem, N.C. (The first round of competition takes place in an elevator.) Judges include representatives from three venture capital firms that represent more than $500 million in venture capital.

Other Competitions

This area of entrepreneurship experiential education has expanded over the last few years to include competitions other than business plan contests, such as the Venture Capital Investment Competition at UNC-Chapel Hill and the Kauffman/Angel Center Entrepreneurship (KACE) competition at Wake Forest University.

New this year is the CASE competition for MBA students who are also Kauffman Entrepreneur Internship Program participants. The interns submit case studies based on their internship experiences and vie for a cash prize. The competition creates an incentive for MBA students and provides a dissemination vehicle for information about the intern methodology.

Other organizations are also coordinating competitions related to entrepreneurship. Among them are the National Collegiate Inventors and Innovators Alliance.
And, Students in Free Enterprise (SIFE), a national student organization, recently received a grant from the Kauffman Center to start a competition with an entrepreneurial focus. The competition, set for spring 2001, asks student teams to study and present how they have made their target entrepreneurial firms grow.

Additionally, the Collegiate Entrepreneurs Organization (CEO!) in November announced finalists in its business idea contest, open to its members and chapters across the U.S. In addition to $10,000 in prizes, entrants can indicate if they welcome review by potential investors.

**Interest From Non-Business Disciplines**

College-level entrepreneurship classes are becoming more common in nonbusiness curriculum. From engineering to the arts, schools are upgrading their curriculum to include entrepreneurship education.

The University of St. Thomas started integrating entrepreneurship courses into its undergraduate liberal arts curriculum three years ago. An assistant professor at Alfred University recently introduced a course on Entrepreneurship and the Arts with the aim of developing a concentration in the subject (Inc., November 2000).

Also, entrepreneurship centers are being founded at non-business schools, including centers at the University of Pittsburgh Cancer Institute and at the University of Mississippi, started through its pharmacy school two years ago. Entrepreneurship education is also now offered in the music department at the University of Colorado.

It should be noted that business and engineering schools have successfully joined together to incorporate entrepreneurship education in a growing number of engineering schools. An estimated 50 universities and colleges have entrepreneurship courses and programs within engineering schools.

Among those that have joint entrepreneurship programs with engineering schools are Carnegie Mellon University, the University of Iowa and the University of Minnesota (Vesper, Gartner, 1999).

In 1997, the Stanford University's School of Engineering created the Stanford Technology Ventures Program, an entrepreneurship center aimed at providing and accelerating high-technology entrepreneurship education for engineers and scientists worldwide. This has served as a model for other engineering schools' entrepreneurship programs. Also, the new Roundtable for Engineers and Entrepreneurial Education (REEE) at Stanford brings together faculty and engineers from across the country.

A number of engineering schools have set up entrepreneurship centers in their schools. For example, the Georgia Institute of Technology -- where the DuPree Center for Entrepreneurship was established in 1994 -- offers a certificate program in entrepreneurship for electrical and computer engineering schools, and a minor for master's and Ph.D. students in biomedical engineering and life sciences degree programs. An interesting new joint program model is being developed among the business, engineering and medical schools at the University of South Florida in Tampa. And, the Entrepreneurship and Personal Enterprise Program (EPE) at Cornell University represents a multi-school, multi-disciplinary approach to entrepreneurship education. The current program was established in 1992 as a combined initiative of the College of Agriculture and Life Sciences and the S.C. Johnson Graduate School of Management. Another example is Laval University in Canada, which began its graduate Technological Entrepreneurship Program in 1996, marking its first joint program between the faculty of Administrative Sciences and the faculty of Sciences and Engineering. It draws students from various schools, including medical, biology, pharmacy and nutrition,
**Student Leadership**

*Clubs/Associations*

Many universities now have entrepreneurship clubs or associations for students. These campus-based clubs arrange speakers, roundtable discussions and provide opportunities for peer learning.

One of the most active clubs can be found at the University of Colorado at Boulder, which, among other activities, hosts quarterly entrepreneur roundtables. Stanford's Business Association for Stanford Engineering Students (BASES) is the major club for engineers interested in entrepreneurship. It runs the annual business plan competition, which is open to all Stanford students.

The Collegiate Entrepreneurs Organization (CEO!), which evolved from the longtime group Association of Collegiate Entrepreneurs (ACE), has the widest outreach, nationally and globally. Headquartered at the Institute for Entrepreneurial Studies at the University of Illinois-Chicago, CEO! provides a network for college students studying entrepreneurship.

After building a regional annual student conference for 10 years, the first national CEO! conference was held in 1997 with 600 students and faculty. Its next annual conference included 700-plus students from nearly 100 universities, and more than 800 attended its most recent conference, in November 2000.

One CEO! chapter, the Cornell Entrepreneur Organization, says its most successful club activities include student entrepreneurship forums for Cornell University students who are running their own businesses, and roundtable discussions featuring an entrepreneurial alum or an entrepreneur from the community.

**Entrepreneurship Centers**

There are more than 100 active university-based entrepreneurship centers in the U.S. (Charney, Libecap, 2000).

Entrepreneurship centers are formally established and budgeted entities within schools. Most but not all are affiliated with business schools. Generally, entrepreneurship centers set out to use educational opportunities to encourage entrepreneurship on campus and in the community.

The growth in entrepreneurship centers did not take off until the early 1990s, about 20 years after the expansion in entrepreneurship courses.

Part of the increased interest can be attributed to a '90s trend in which major publications began routinely ranking schools and programs based on their offerings in entrepreneurship education.

In Measuring Progress in Entrepreneurship Education (Executive Forum, 1997), Karl Vesper and William Gartner wrote:

"...ratings and rankings have powerful effects on universities. High-ranked programs receive more inquires, applications and enrollments. Schools that depend on tuition income pay close attention to applications and enrollments. Hence, ratings influence what schools offer."
Entrepreneurship centers often are created and sustained by endowments. For instance, the Batten Center for Entrepreneurial Leadership at the University of Virginia, set up in 1996 by an initial $10 million from Frank Batten Sr., chairman of Landmark Communications, is now endowed for $60 million.

Other examples include the Lloyd Greif Center for Entrepreneurial Studies at the University of Southern California, which was established by a $5 million endowment from alum Lloyd Grief, president and CEO of the Los Angeles investment banking firm Greif & Co., and the Center for Entrepreneurship at the University of Colorado at Boulder, endowed by a gift from Robert H. and Beverly A. Deming in 1998.

In response to the growth of excellence in the field and increased interest, and in an effort to bring together the best centers and their ideas, the National Consortium of Entrepreneurship Centers was initiated in 1995 and formalized in 1999 with its administration offices at Ball State University.

With sponsorships from the Kauffman Center, NASDAQ and Beacon Venture Capital- and leadership from University of Maryland, University of Southern California and Ball State University - the Consortium serves as a vehicle by which the centers can share information, develop special projects and assist each other in advancing and improving their centers’ impacts. It kicked off with 60 inaugural members, and has its administrative office at Ball State University's Midwest Entrepreneurial Education Center.

**Students Starting Companies**

The number of students starting companies is on the rise, and research shows these startups are coming from students in undergraduate and graduate entrepreneurship programs.

In 1998 alone, 364 companies were started around technology developed in universities, reports the Association of University Technology Managers (Inc., 2000).

Investors, including student-driven groups, are seeking out startup ideas on campuses across the U.S.

In response to the boom of student-run companies, a host of new investment organizations specializing in campus startups has sprung up over the last 12 months, says a November 2000 Inc. magazine article. Many were started by students.

It's important to understand this movement of students launching companies from the classroom.

- Students now come into MBA programs specifically to start a business;
- They're entering very sophisticated programs designed to launch a business;
- They're entering programs highly experiential. They work on a business plan, have internships with entrepreneurs and meet venture investors; and,
- Students build networks. So after two years, they have in hand a completed business plan, a network in place and hands-on experience. It's not surprising that they're starting companies.

Also, aiding this movement is the increasing number of programs that make venture capital available to college students wanting to start their own firms.

One of the newest programs funded by the Rudd Family Entrepreneurial Fund is modeled on successful efforts at Columbia, Northwestern and MIT. The new college program may serve as a national model to spur entrepreneurship in less entrepreneurial communities across the country, according to the National Commission on Entrepreneurship.
The fund is setting aside $1 million in seed money to fund business ideas by students at the University of Kansas, Kansas State University and Wichita State University. The foundation said its mission is two-fold: to spur more entrepreneurship education and vibrant economic development for the state of Kansas.

In their 1999 summary of University Entrepreneurship Programs, Karl Vesper and William Gartner said of the 104 schools with programs, 51 listed one or more start-ups by students either during or closely following school. In total, there were 145 start-ups reported. The total number of startups reported, out of the 128 reporting schools, was 147 (less than 1.20 startups per school).

Examples of recent student startups include FlySwat, an Internet company started by University of Chicago student and entrepreneurship program intern Ray Krouse. He sold his firm last year for $100 million. And, as a student at the University of Illinois-Urbana, Dr. Stuart Jackson, Ph.D. in engineering, commercialized technology from the Mayo Clinic with his Overland Park-based AnalyzeDirect.com, which he started after interning at Mayo Medical Ventures in 1999.

Research indicates entrepreneurship program graduates are three times more likely to be involved in the creation of a new business venture than their nonentrepreneurship business counterparts. Further, Alberta Chaney and Gary D. Libecap found that graduates of the University of Arizona's Berger Entrepreneurship Program were 11 percent more likely than were non-entrepreneurship students to own their own businesses after graduation (Impact of Entrepreneurship Education, 2000).

Section II: Faculty

Curriculum Design

Increased interest in entrepreneurship has spawned increases in the number of related courses being offered at colleges and universities, in student attendance in entrepreneurship courses, research in the field, and expansions and/or plans to expand programs.

A recent example of the latter is found at the Fuqua School of Business at Duke University, where entrepreneurship courses and activities have been given a high priority (Success, 2000). The school formed the Center for Entrepreneurship and Technology Entrepreneurial in 1999, and it may soon add an entrepreneurship sequence in its MBA program.

One recent study shows an average attendance of 50 in undergraduate entrepreneurship classes and 53 for graduate-level courses. That compares to the findings in the 1997 Solomon-Winslow study that put the average class size for entrepreneurship courses at 30.

Another recent study (Vesper & Gartner, 1999) points to the degree of student interest in entrepreneurship programs. For example, the University of Pennsylvania estimates 1,400 students take at least one entrepreneurship course each year. Other schools with high enrollment in entrepreneurship courses include HEC Montreal (1,000), Cornell (1,000) and Fairleigh Dickenson University in New Jersey (700). Harvard reports that 90 percent of its MBAs take an entrepreneurship course, while 50 percent of its students take two or more courses.

As far as course offerings, 35 percent of those universities surveyed in the 1999-2000 Winslow-Solomon study offer a Small Business Management course, 25 percent an Entrepreneurship course and 15 percent a course on
New Venture Creation. Less prevalent are courses in Technology and innovation (7 percent); Family Owned Business (6 percent); Venture Capital (6 percent); Creative Management (4 percent) and Franchising (2 percent).

Average class size data indicates rising interest in New Venture Creation, a course that concentrates on how new businesses are started. The most recent Winslow-Solomon study showed New Venture Creation with the highest average number of students in classes (61) in a comparison of four undergraduate and graduate courses: Entrepreneurship, New Venture, Small Business and Family Business.

**Innovative models**

Because there is no set approach to entrepreneurship education, it's been necessary to experiment with pedagogy and curricula in the field, leading to some innovative entrepreneurship curricula and programs. The learning has benefited not only entrepreneurship education but has crossed over to enhance other fields.

A survey of deans, department heads and development officers at the University of Arizona indicate that pedagogical innovations in entrepreneurship education significantly improved the curriculum in other business disciplines, including the MBA program. (Charney, Libecap 2000).

An example of innovative entrepreneurship education can be found at Miami University, which now allows students in its undergraduate program to minor in entrepreneurship. Also offered to all Miami University students is a three-course Thematic Sequence entitled Entrepreneurship in Different Contexts.

And, Babson College's Freshman Management Experience exemplifies innovative undergraduate curriculum. During the yearlong course, initiated in 1993, student teams plan, develop, launch, manage and liquidate a for-profit venture. Profits in excess of the seed capital fund a charitable project, with the remainder donated in cash. Further, Babson College's new two-year MBA program is-based on the new venture model. Students trace the business life cycle from launching a product or service. (Vesper & Gartner, 1999)

Other innovative programs include the University of Maryland's eDorm, which provides undergraduate business students an incubator-like facility where they live, on campus. The program is sponsored by the University of Maryland's Smith School of Business and Dingman Center for Entrepreneurship and the Clark School of Engineering.

The dorm is equipped with technology that includes desktop videoconferencing, multimedia messaging, high-speed data connections, voice over the Internet, and wireless roaming technology. The students, in their quest to start a business, can also access equipped conference rooms.

A new program with similar intent is E-Launcher, an on-campus business incubator at the University of North Carolina-Chapel Hill's Kenan-Flagler Business School. The project, begun last year by the school's Center for Entrepreneurship and Technology Venturing, is housed in the basement of the business school building and houses student startups.

**Teaching Methods**

The most popular teaching methods in entrepreneurship education, according to the 1999-2000 Winslow-Solomon study, are creation of business plans, case studies and lectures, respectively. A notable change in this area from the top 3 methods list from the 1997 survey was the absence of guest speakers, a
method that ranked in the top 3 methods in the authors' earlier study, along with business plan creation and case studies.

Fifty-two percent of those schools surveyed in the most recent Winslow-Solomon study require web-based assignments as part of the curriculum. Additionally, 41 percent of those schools surveyed said they offered information on the web to both students and entrepreneurs regarding entrepreneurship and New Venture Creation.

The most popular textbooks and reading books used in entrepreneurship education, as indicated in the most recent study are: *New Venture Creation*, Jeffrey Timmons; *Small Business Management*, Longenecker, *Entrepreneurship*, Hisrich and Peters; *Entrepreneurship.- A Contemporary Approach*, Kuratko and Hodgetts; and *Effective Small Business Management*, Scarborough and Zimmerer.

Twenty-three percent of those surveyed in the 1999-2000 study said no periodicals were required or recommended reading in class, while 22 percent listed as required or recommended: *Inc.* magazine, 15 percent *Entrepreneur* and *The Wall Street Journal*, and 14 percent *Business Week*.

**Organizations, Clubs and Professional Groups**

The number of entrepreneurship organizations, clubs and professional groups is growing, as membership interest continues to rise.

The Academy of Management started its Entrepreneurship Division in 1986, and it now has 14 percent of the academy's total membership. Also, the Academy, at its 13th annual conference in San Diego last January, created a new related division, the International Entrepreneurship Division.

Another group to note is the United States Association for Small Business and Entrepreneurship, an eclectic group of government officials, directors of small business development centers, and academics in fields like finance; marketing, management, and economics united by their common interest in entrepreneurship and small business. In 1985, the name was changed from the U.S. Council for Small Business to reflect Entrepreneurship in the name. Divisions include both Individual Entrepreneurship and Entrepreneurial Education.

**Notable Breakthroughs**

The explosion of interest in entrepreneurship has given rise to what many might call breakthrough developments. One result is attention and action by the unlikely. Case in point: the creation of an entrepreneurship center at the University of Chicago.

A very traditional school, known for its Nobel Prizes in economics, the University of Chicago's Graduate School of Business set up an entrepreneurship center two years ago, and has an entrepreneur - Ellen A. Rudnick - running it.

The Entrepreneurship Program, created with the help of a five-year, $1 million grant from KCEL, coordinates research, teaching, entrepreneurial experiences, and outreach to the business community. Scholars from a variety of academic areas are conducting research and developing new paradigms to teach students how to launch successful start-ups.
Research

The infrastructure of the field really didn't begin to develop until the 1980s and 1990s, with specialized journals and annual conferences. The number of journals has grown to 35. But what really fueled tremendous growth was student interest, reflected in the increased number of courses in entrepreneurship being offered.

Studies indicate that entrepreneurship as a research discipline exhibits that the field has not fully attained legitimate discipline status, but they also suggest that entrepreneurship as a discipline exhibits emergent qualities. (Entrepreneurship in Emergence: Fifteen Years of Entrepreneurship Research in Management Journals).

The emergent-like characteristics, as outlined by the paper, include growing publication base, use of multi-disciplinary perspectives, lack of an established paradigm, increasing citation of entrepreneurship journals, growth in theory-building research and less sophistication in research methods.

The paper found that entrepreneurship journals are being cited more. In recent years, the *Journal of Business Venturing* (JBV) has emerged as the strongest journal dedicated exclusively to the entrepreneurship domain, while *Strategic Management Journal* and *Administrative Science Quarterly* remain clear leaders as reference sources.

The JBV's "rise to prominence" is suggestive of the development of a vibrant community within entrepreneurship and thus presents positive opportunities for entrepreneurship academics, states the paper. Also, *Strategic Management Journal* -- the top journal in strategic management and published by the Strategic Management Society -- is planning a special issue on entrepreneurship this summer. The issue, *Integrating Strategy and Entrepreneurships Perspectives*, features four guest co-editors, Michael Camp (KCEL) Duane Ireland (University of Richmond), Michael Hitt (Arizona State University) and Don Sexton (Sexton & Associates).

Also as part of the above project, the *Academy of Management Executive* -- a practitioner-oriented journal for managers and other business leaders -- published a special issue, Strategic Entrepreneurship; the Center hosted a research conference, sponsored by the University of Richmond, Arizona State University, Strategic Management Society and the Kauffman Center; and a book - which will be part of the Strategic Management Society's research series and include more than 14 chapters from the papers presented at the conference -- is expected later this year.

But while empirical work in the entrepreneurship domain seems to be increasing, the paper found that theoretical work remains at a consistently low level.

Trend analysis indicates an increase in research publications of practical and applicable research finding (Sexton & Smilor, 1997). And, some evidence points to a growing awareness of university-based research and educational programs in entrepreneurship.

Two driving forces are creating an environment conducive to increasing the relevance of entrepreneurship research: the broadening and deepening of acceptance of entrepreneurship as a discipline worthy of teaching and research, and a change in the accrediting process that permits and encourages flexibility in the provisions of incentives for alternative research regimens (Sexton & Smilor, 1997). The 1992 modification by the American College Schools of Business, ACSB, as noted by Sexton and Smilor, changes the group's accreditation standards to give equal treatment to applied and instructional research.
In an effort to further research efforts in this field, an estimated 50 university centers, research organizations, and foundations in the U.S., and several foreign affiliates have formed The Entrepreneurial Research Consortium.

The temporary group plans to initiate the U.S. National Panel Study of Business Start-ups. Each membership unit or foreign affiliate is sponsoring multiple researchers, and more than 100 scholars are involved.

The study involves identifying a representative sample of firms-in-gestation and following their progress for up to 18 months. Details regarding the member units, individual scholars, organizational material, project timetable, and current status of the research design will be provided online. This first-of-its-kind study looks to revolutionize what we know about why people start new ventures and how.

A series of publications called Frontiers of Entrepreneurship Research offers a comprehensive collection of empirical research papers on entrepreneurship. The papers are selected from those presented at the annual Babson College-Kauffman Center Entrepreneurship Research Conference.

Since 1986, summaries of papers presented but not published in their entirety have also been included to present a more comprehensive overview of research in the field. Over the years, participants have come from more than 30 nations, and authors represent a cross section of universities, private businesses, and government agencies.


The number of abstracts presented at the conference also has risen, particularly over the last four years, with just short of 200 abstracts in 1997 and 250 abstracts in 2000.

Additionally, as part of its annual national meeting, the Academy of Management's Entrepreneurship Division now includes a four-day, research-oriented program of paper presentations and symposia by some of the top researchers in the field.

**Faculty Training**

The increased number of entrepreneurship courses and programs translates into an enhanced demand for faculty in the field. It's important to look at how the demand is being met by higher education, specifically in terms of faculty training opportunities.

And, because Ph.D. programs are preparing the entrepreneurship faculty and researchers of tomorrow, it's important to both gauge the current state of doctoral education in entrepreneurship and take a look ahead (Duhaime & Hitt, 2000).

One program aimed at training more effective, innovative teachers of entrepreneurship is Lifelong Learning for Entrepreneurship Education Professionals (LLEEP), a collaborative partnership that includes the Kauffman Center, the Price Institute for Entrepreneurial Studies, the Arthur M. Blank Center for Entrepreneurship at Babson College, the University of Colorado-Boulder, Miami University of Ohio, Rensselaer Polytechnic Institute, and the University of California-Berkeley.

The Price-Babson College Fellows Program is the flagship of LLEEP, which expands the Symposium for Entrepreneurship Educators (SEE) program, and offers a series of practitioner-driven clinics.
An example of adjunct faculty training can be found at Miami University, host to "The Experiential Classroom," one in the LLEEP series of clinics. The LLEEP clinics, designed to provide a sharper focus on improved teaching and scholarship than is possible at SEE, also include The Dynamic Classroom at the University of Colorado at Boulder; Roundtable on Entrepreneurship Education for Engineers at Stanford University; and The Electronic Classroom at Rensselaer Polytechnic Institute.

Another offering aimed at entrepreneurship educators comes from the Academy of Management. Through its Entrepreneurship Division, the academy has a doctoral consortium that provides advanced PhD. students in entrepreneurship extensive and intensive exposure to leading entrepreneurship researchers and educators, as well as the cutting edge issues in entrepreneurship research, teaching and careers. Faculty training includes writing entrepreneurship in curriculum design. (The Entrepreneurship Division also formed a Task Force on Doctoral Education).

In their study, "State of Doctoral Education in Entrepreneurship," Irene M. Duhaime (Georgia State University) and Michael A Hitt (A&M University) say 82 percent of the responding deans reported that their schools offer entrepreneurship courses at the undergraduate level, 69 percent reported such at the master's level but only 8 percent indicated entrepreneurship courses at the Ph.D. level.

Most deans surveyed in the study indicated their schools' commitments to entrepreneurship academic offerings were increasing but fewer indicated increased commitment to entrepreneurship research.

Slightly more than 10 percent of the young scholars surveyed in the Duhaime-Hitt study received a Ph.D. with an official major or concentration in entrepreneurship. The scholars survey indicated 60 percent of the institutions from which the young scholars graduated offered graduate courses on entrepreneurship topics but found that 34 percent of the institutions offered no doctoral courses in entrepreneurship and another 32 percent offered only one. Indiana University established a PhD. program in entrepreneurship in 2001.

There is a tendency, the study found, to use non-tenure track and part-time faculty to teach the entrepreneurship courses. More than half of the schools that offer master's courses in entrepreneurship report that full-time tenure track faculty teach in their master's level offerings, while 19 percent of the deans surveyed report full-time nontenure track faculty and 27 percent report that part-time adjunct faculty teach in their master's level entrepreneurship courses.

The authors say this may reflect a shortage of doctoral qualified faculty in entrepreneurship, a general lack of respect for entrepreneurship scholarship, or cost considerations in staffing entrepreneurship courses.

**Section III: Administration**

A marked increase in the number of endowed positions points to the explosive growth in the field of entrepreneurship.

Endowed positions are considered a benchmark for measuring growth in the field and also allows further study of the infrastructure of the academic discipline of entrepreneurship. Endowment studies, as well as boards, alumni, public perception, all play a role in budget discussions for staffing and programs.
Business leaders view entrepreneurship education as a useful, applied approach to the study of business and the economy. As a result, established entrepreneurs are more willing to fund entrepreneurship programs and to endow professorships within them. (Charney, Libecap 2000).

In a recent report that surveyed business school deans, Irene M. Duhaime and Michael A. Mitt found that most deans believe their “donors and resource providers” support a strong program in entrepreneurship. The authors also concluded that business school deans feel that having a strong program in entrepreneurship is a sufficient condition but not a necessary condition for their schools' success.

Business schools in Europe and elsewhere are modeling the success of the American academic entrepreneurship infrastructure by adding endowed positions (Katz, 1999).

**Endowments**

The number of endowed positions in entrepreneurship has increased an estimated 120 percent in just the last five years (Charney, Libecap, 2000).

There are 271 endowed positions in entrepreneurship and related fields (as of October 1999), up from 123 positions in 1994, according to the Jerome Katz and his report, eWeb's 1999 Survey of Endowed Positions in Entrepreneurship and Related Fields.

Additionally, endowment levels have increased substantially, with positions 10 or more years old reporting average endowments of $900,000, while positions created in 1998-1999 have average endowments of $2.16 million, according to the study, sponsored by the Kauffman Center, The Coleman Foundation and the University of Colorado-Boulder.

One of the most pronounced changes in the endowment process during the 1990s has been the growth in size of endowments for new positions, Katz found. The growth translates to a new endowed position every 13 days, compared to a growth rate of one new endowed position every 36 days for the 1991-1994 period. (Katz, 1999)

And, Katz found the number of endowed positions outside of business schools has grown dramatically, with endowed positions now found in schools of engineering, agriculture, arts and sciences, and other more specialized professional schools.

**Entrepreneurship Centers**

The National Consortium of Entrepreneurship Centers was started four years ago with about 10 schools. Now it includes as many as 60 schools.

Entrepreneurship centers have expanded both their reach and location over the last few years. They're located not only in business schools but also in outreach programs as well. Examples include The Stanford Technology Ventures Program, created in 1997 as an entrepreneurship center within the Stanford School of Engineering, and the Office of Business Innovation and Entrepreneurship (OBIE), housed in the College of Commerce and Business Administration at the University of Illinois at Urbana-Champaign.

Typically, what differentiates an entrepreneurship center from an entrepreneurship program is a center's appropriated budget and staff. Entrepreneurship centers are now an entity, not just one person.
Endowments have played a huge role in creating and expanding entrepreneurship centers and programs.

Examples of this include the $60 million Batten Institute of Entrepreneurship at the University of Virginia, made possible by Frank Batten, retired chairman of Landmark Communications; the expanded entrepreneurship program at the University of St. Thomas (Minneapolis-St. Paul), funded by Dick Schulze, founder of Best Buy; and a new building to house entrepreneurship programs at MIT Sloan School of Management, made possible by William Porter, chairman emeritus of E*Trade Group Inc.

**Ranking Programs**

In the 1990s, a number of major publications, including *U. S. News and World Report, Business Week Success and Entrepreneur*, began ranking business schools using entrepreneurship programs in the criteria.


Administrators look at published entrepreneurship rankings to see how their school stacks up. Publication of ratings and rankings has powerful effects on universities (Vesper & Gartner, 1997).

"High-ranked programs receive more inquiries, applications and enrollments ...Hence, ratings influence what schools offer," the authors write in Measuring Progress in Entrepreneurship Education.

"All of these rankings demonstrate the excellence in different programs across the U.S. (Kuratko). But they often shortchange some of the most progressive programs found outside the U.S., some excellent undergraduate programs and some of the smaller schools (Karl Vesper, William Gartner).

In response, Vesper and Gartner assembled a Compendium of Entrepreneurship Programs for a more unbiased look at entrepreneurship programs, and Kuratko said it was these rankings that helped point to the need for entrepreneurship programs to communicate and collaborate. Hence, the vision for a National Consortium of Entrepreneurship Centers was born, he said.

**Section IV: Entrepreneurs**

College and university programs are expanding their outreach to entrepreneurs; both on and off campus -- by offering or sponsoring continuing education and community programs aimed at entrepreneurs, and by requesting their participation in the classroom. Entrepreneurs are responding with their time and money as they step up to fund student-run companies, endow programs and chairs, and participate in intern and mentoring programs.

The popularity of entrepreneurship education can be attributed, in part, to the way it forges the link between the business and academic communities (Charney & Libecap 2000). The authors report an increased willingness by established entrepreneurs to fund entrepreneurship programs and to endow professorships within them:

Also, entrepreneurs enjoy getting involved with young, talented and smart students, and reap satisfaction sharing their knowledge and experience with others. Their involvement helps to build ties to the school, which may help their business in the long run, and represents, especially for alumni, a way "to give back."
Outreach
More than half of those surveyed in the 1997 Winslow-Solomon study say their entrepreneurship programs are involved in outreach programs that teach entrepreneurship to community members and/or lower level schools:

One result of this movement is that entrepreneurs, with the assistance of college and university outreach programs, are becoming more engaged in the community as well as in the classroom as featured speakers. Examples include offerings at the Midwest Entrepreneurial Education Center, the outreach entity of the Entrepreneurship Program at Ball State University. The center hosts executive development seminars and an entrepreneur lecture series.

Many entrepreneurship centers serve as a networking force to bring entrepreneurs together, handing entrepreneurs more opportunities to learn from each other. Outreach programs also work as a conduit for entrepreneurs to meet investors, both business angels and venture capitalists.

Some centers hold one-day seminars or breakfast meetings aimed at providing learning opportunities for entrepreneurs. One example of this is Entrepreneur Roundtables -- bimonthly meetings of entrepreneur seminars, workshops and short courses - hosted by the Dingman Center for Entrepreneurship at the University of Maryland.

In the Classroom

Entrepreneur participation with students in and out of the classroom increased in the mid to late 1990s as experiential teaching methods such as field studies, business plan competitions, and intern programs, became more popular. The cornerstone of experiential learning has become the entrepreneur in the classroom (Smilor, 2001)

Increasingly, entrepreneurs volunteer as judges for business plan competitions and as mentors. They get involved, are the subject of case studies and offer their companies as host sites for intern programs.

An example of that kind of involvement was recently cited by an Inc. magazine (October, 2000) article that focused on the relationship between a former entertainment lawyer turned entrepreneur who mentored an undergraduate student in the 1999 business plan competition at Brown University.

After the competition, the mentor, Steve Massarsky, who co-founded comic book publisher Voyager Communications, went further. The student, Jessica Nam, and her bread-making business, Jessica's Wonders, was Massarsky's first start-up in his new New York City-based incubator, Business Incubation Group Inc.

Training/Continuing Education

Forty-six percent of those colleges and universities surveyed in the 1997 Winslow-Solomon study offer continuing education programs in entrepreneurship.

KCEL's FastTrac program, offered since 1998, exemplifies a popular and successful education program aimed at helping entrepreneurs hone their skills. The number of colleges and universities that offer FastTrac courses has grown from 24 in 1998 to 56 currently.

As Faculty
More and more entrepreneurs are joining the ranks of visiting and part-time faculty at business schools, particularly in entrepreneurship programs, but former entrepreneurs apparently represent only a small percentage of full-time faculty.

These in-demand entrepreneurs are finding themselves more accepted and recognized as part of faculty - in terms of respect - but it is rare, particularly at major universities, for them to become tenured faculty with voting power.

For example, at the University of Colorado at Boulder, two of the 10-person faculty come from a non-academic or entrepreneurial background. This includes former entrepreneur Frank Moyes, clinical director of LLEEP's The Dynamic Classroom

"We are invited to faculty meetings, and can participate and give our opinions," Moyes said, "but decisions that are going to be made about the curriculum, and about what the courses are going to be, are made by tenured faculty. They may listen to us but we have no official say, no vote."

Michael Morris at Miami University of Ohio, clinical director of LLEEP's The Experiential Classroom said universities and colleges tend to use and treat entrepreneurs differently, depending on their program model and size of school For example, entrepreneurs involved in larger programs, such as those at Babson University and the University of Texas, may constitute a sizeable quantity of their entrepreneurship program faculty.

He points out that entrepreneurs should be used in different ways, depending on the individual person. Not all of those entrepreneurs who are interested in teaching are willing to prepare for or take the time to prepare for the classroom.

Whether they are accepted as faculty depend on the individual person and university or college, Morris said. Generally, he said, a full-time entrepreneur turned faculty member is not going to be on a tenure track-primarily because he or she likely doesn't have the time or interest to do the research required

With the growth and interest in entrepreneurship programs, colleges and universities continue to need entrepreneurs on campus. But as it stands now, Morris said, academics remains "a different world." The mainstream model remains one of tenure, driven by research, and though individual schools are attempting to address the changing roles of entrepreneurs as faculty, Morris doesn't see the model radically changing anytime soon.

Efforts in this area include the creation of a "dual ladder" for entrepreneur turned faculty, There is some distinction being added with these "clinical" professors. Examples include Steve Rogers at the Kellogg School at Northwestern University and Tom Byers at the Engineering School at Stanford University.

Entrepreneurs on Advisory Boards

Though it's not universal, colleges and universities are including entrepreneurs on their advisory boards, especially on the advisory boards of entrepreneurship centers, handing entrepreneurs an additional behind-the-scene influence on entrepreneurship in higher education.

The University of Colorado at Denver seems to have the largest entrepreneur advisory board, with 43 members, noted Karl H. Vesper and William Gartner in their study, University Entrepreneurship Programs-1999. But the authors also highlighted Brigham Young University's entrepreneurship program, which is totally financed
through annual contributions and endowed funds received from an estimated 100 practicing entrepreneurs. (The group is known as Entrepreneur Founders.)

Section V: Gaps and Opportunities

Scholars and industry observers expect continued growth in overall entrepreneurship interest and a sustained popularity and fine-tuning in the field of entrepreneurship and higher education.

As expected, a scan of college and university programs and initiatives reveal areas of untapped opportunity and issues demanding further exploration.

The gaps identified in areas such as research and faculty training present specific challenges and warrant attention. Further, opportunities exist in the area of entrepreneurship education and technology, particularly in terms of accelerating programs via the Internet.

Entrepreneurship has benefited from its status as an experimental field. Drucker warns that entrepreneurship educators and supporting organizations must continue to find ways to develop and enhance initiatives but at the same time ensure ongoing experimental curriculum design. Also, we need to continue the push to non-business disciplines.

Changing Culture of Higher Education/Non Business Disciplines

As more and more business schools recognize the impact of entrepreneurship education, we must continue the push to demonstrate the importance of entrepreneurship to all institutions and across campuses to non-business schools. This means finding more ways to weave entrepreneurship into non-traditional fields, such as engineering, music and law.

Ideas include creating broader competitions, including developing a set of entrepreneurship awards similar to the McArthur genius awards, and expanding relationships with key organizations, such as the American Assembly of Collegiate Schools of Business (AACSB).

Research

Though improvements have been made and noted, this area - along with the preparation of teachers -- is perhaps one of the most critical issues in entrepreneurship and higher education.

There's a need to build legitimacy in the field, in part by improving the quality of research, developing more theories, and becoming more quantitative and more scientific.

By offering requests for proposals, targeting the work of key scholars and providing recognition and rewards for entrepreneurship scholarship, the academic dignity of entrepreneurship can be enhanced.

Preparing Future Teachers/Scholars

We must better identify opportunities to prepare future teachers and scholars. One way is to expand the development of Ph.D.s in entrepreneurship. Ideas include becoming more involved with professional organizations and providing scholarships in this area.
Research by Duhaime and Witt points to the need of better educating university administration on the benefits of expanding entrepreneurship education at the master's and doctoral levels, and of finding ways to influence their attitudes toward entrepreneurship research.

The authors said that while the business school deans surveyed may believe that current levels of entrepreneurship offerings at the master's level are adequate, it was more likely that the deans' personal assessments of entrepreneurship research rigor and quality explain their low levels of commitment to doctoral education in entrepreneurship.

One of the challenges, noted Arnold C. Cooper, is to continue to develop the intellectual underpinnings of the entrepreneurship field. Part-time faculty, used by many universities for entrepreneurship courses, do not have the time or the training to do the research needed to move the field forward.

We need to create more career opportunities for young faculty, from whom future research contributions will come. Young faculty must be supported, mentored and encouraged, Cooper said in "Entrepreneurship, Innovation and Wealth Creation."

The Web and Higher Education

Distance learning creates a wealth of options for expanding programs and unveiling new curriculum, and faculty must continue to be trained in this area. One example of programs in this area is a LLEEP clinic that focuses on The Electronic Classroom.

The University of Phoenix's recent, unconventional use of an IPO to raise fluids for its online learning arm, exemplifies innovation in this area and is an indicator of opportunity.

Experiential Learning

The entire field of experiential learning in higher education, including internship programs, is expanding -- creating gaps and opportunities.

Due to the emphasis on and increased demand for experiential learning as part of the entrepreneurship curriculum, many schools are creating faculty and administrative positions to manage programs in this area. For example, Wells College, a small women's college in New York, recently added a vice president of experiential learning.

Summary

For 30 years the field of entrepreneurship has labored for legitimacy in the academic community. The early pioneers of the field, in many respects, acted very entrepreneurially by recognizing the opportunity and laying a solid foundation on which to build a bright future.

As this report documents, the field has advanced in many notable respects. There are more than 1,400 colleges and universities offering some form of entrepreneurship education. Nearly $500 million is invested in more than 250 endowed professorships and chairs in entrepreneurship, and hundreds of millions more have been invested
in various forms of collegiate education programs. The National Consortium of Entrepreneurship Centers lists more than 100 collegiate entrepreneurship centers in its membership ranks.

Due in part to the enormous impact entrepreneurs are making in our society and our economy, thousands of undergraduate and graduate students are benefiting from sound entrepreneurship education. Faculty are responding aggressively to the rapid increase in student enrollments and are innovatively introducing entrepreneurship curriculum to non-business areas of science, engineering and the arts.

The progress has been so great, in fact, that some of the early pioneers of the field have suggested that the war is over, that entrepreneurship has established itself as a legitimate field of study in higher education. The Kauffman Center believes that the field has gained considerable respect over the last two decades, but that a variety of opportunities and challenges remain which compel us to press on. Doctoral programs are developing, but much more can be done to train future tenure-track faculty in the mainstream business disciplines on the significance of entrepreneurship.