Working Paper
Preliminary

Historical Aspects and Current Status of Entrepreneurship in Japanese Universities

by

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Abstract

Since the Technology Licensing Organization (TLO) Act was enforced in 1998, entrepreneurial activities have developed at an accelerating pace in Japanese universities. The movement has been shaped by the history of Japanese higher education and government policies. Japanese universities, once the academic arm of the Meiji imperial government, tried to become free from government and commercial influence after the World War II. In the past two decades, under the broader needs of revitalization, Japanese universities have developed industry-university cooperation in which entrepreneurial activities are involved. These activities can be categorized into TLOs, university-based ventures and entrepreneurship education. The major findings are: (1) the entrepreneurship movement at Japanese universities is mainly exogenous, and attempts at commercialization are still met with opposition; (2) activities tend to be evaluated based on numerical results; and (3) although more than 200 Japanese universities now run programs or courses related to entrepreneurship, most are still immature and peripheral in nature. The movement will not be limited to commercialization of intellectual activities, and is an influential axis for developing competence of students and researchers.

Key words: Entrepreneurship, Entrepreneurship Education, University, Venture, Japan.

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1. Backdrop: Entrepreneurship in American Universities

Entrepreneurship education seeks to provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings. As is widely known, entrepreneurship is one of the driving forces of the global economy and society. It generates ongoing innovation and improvement in goods, services, and various sorts of our activities.

Entrepreneurship has long been overlooked as a topic of economic study, but in the present we recognize that it is one of the major generators of wealth in the global economy. In the last century, entrepreneurship, which was a relatively new component of the curricula of American higher education, has begun to emerge as a discrete area of study of ever broadening interest and applicability.

We now recognize that even young and inexperienced university students enjoy windows of opportunity to start up new businesses which can grow into global high-growth companies. In the U.S., 1,274 students in the top 50 programs nationwide launched businesses while still in school, and academic entrepreneurs account for 8.6% of venture-backed companies founded between 1992 and 2001.[1] Sun Microsystems, Yahoo!, and Google were launched by graduate students of Stanford University. Mark Zuckerberg, CEO of Facebook, Inc., co-founded the top social networking website with his classmates in an undergraduate dorm at Harvard University, and Sam Altman, CEO of Loopt, Inc., founded the company during his sophomore year at Stanford. Blake Ross, creator of Mozilla Firefox, the second most widely used browser in the world, started to work at Netscape Communications at the age of 15 before he entered Stanford.

Many leading enterprises have emerged in American universities, creating vast revenues and jobs from zero. Google now employs more than 19,000 people and Yahoo! employs 13,900. SAS Institute, which began as a research project at North Carolina State University for analyzing agricultural data, is today the world's largest privately held software company with nearly 11,000 employees. Innovations resulting from university-based research are not limited to certain sectors of the economy. Rather, the discoveries emanating from university research span the economy, producing innovations in health care, energy, education, communication, entertainment, transportation, manufacturing and defense, among many others. This capacity to commercialize university-based research makes the United States the envy of the world.

Entrepreneurship is already an expanding area of university learning in the U.S., and is becoming a basic part of what universities themselves do. Entrepreneurship is one of the fastest growing subjects in today's undergraduate curricula of American universities and colleges. In the past three decades, formal programs (majors, minors and certificates) in entrepreneurship have more than quadrupled, from 104 in 1975 to more than 500 in 2006.[2]

The growth of entrepreneurship in American higher education is supported by an

[1] Hwang (2009), p. 2.

[2] Kauffman Foundation (2009), p. 6.

affinity between entrepreneurship and common American ideals. Americans have a strong tendency to challenge the status quo, be positive attitude, pursue a dream, become a millionaire, and never to give up. These ways of thinking are closely related with entrepreneurship. Yesterday's heroes such as Edward Harriman, John Rockefeller, Andrew Carnegie and Henry Ford still capture their imagination.[3] The frontier spirit of Americans is practically synonymous with entrepreneurship.

Even for ordinary Americans, entrepreneurship is seen as a positive ideal that generates ongoing innovation and improvement, and that makes life more efficient, affordable, and effective. Entrepreneurship is a distinctive form of human agency that fuses the desire for constant improvement with confidence in the ability to fulfill that desire. It mixes optimism with realism in the American way of thinking.

2. Reform of the Japanese University System

Turning to Japan, we find that the country has been making various efforts to promote entrepreneurship. During the last three decades, many people have critical mind toward the international competitiveness of Japanese universities where high-growth emerging companies can be created as a result in university campus and laboratories.

Japan has produced many great entrepreneurs such as Yataro Iwasaki (1835-1885), founder of the Mitsubishi Group; Sakichi Toyota (1867-1930), founder of Toyota Motors; Konosuke Matsushita (1894-1989), founder of Panasonic; and Soichiro Honda (1906-1991), founder of Honda Motors. These old winners were not produced by Japanese higher education[4], but instead they launched independent business ventures using their own power. Did Japanese schools have any effect on these old entrepreneurs? Did Japanese higher education provide any support to young people intending to launch ventures? In fact, there was very little contact between these old entrepreneurs and schools.

For entrepreneurship on campus, the operative word is clearly to commercialize discoveries, explorations and experience from research activities. To see how Japan differs from the U.S., we must examine the historical development of Japanese universities especially in terms of their governance and management. Table 1 shows the chronology of the development of universities in Japan and America. It reveals how Japanese universities have developed under the strong influence of the government in comparison with American universities, most of which are privately operated schools.

2.1 Universities as Governmental Arm

The Meiji Restoration of 1868, which triggered enormous changes in the Japanese political and social structure, is regarded as the point of entry into the modern age.

[3] Quoted in Reich (1992), p.25.

[4] Iwasaki was a graduate of private school (juku) for the samurai class. Toyota, Matsushita and Honda were graduates of 8-year elementary schools.

Throughout the Meiji era, a small group of high-ranking bureaucrats controlled the imperial administration system. These Meiji era reformers were highly conscious of the importance of education and advancement of knowledge to Japan's rapid modernization and industrialization in order to catch up with the West. Thus they created a new higher education system consisting of imperial universities to train the nation's elite, namely prestigious government bureaucrats, business people, engineers, doctors, lawyers, professors, and other professionals.

The main mission underlying the higher education of Imperial universities was to achieve the needs of the Japanese Empire and contribute to national strength. The dominance over universities was demonstrated by the power to appoint university presidents by governmental order. Under the government's Imperial University Ordinance of 1886 (*Teikuku daigaku rei*), three private schools of the shogunate of the Tokugawa era were transformed into Tokyo Imperial University in 1886. Only nine imperial universities consisting of Tokyo, Kyoto (1889), Kyushu (1903), Hokkaido (1903), Tohoku (1909), Keijo (1924, in Korea), Taihoku (1928, in Taiwan), Okasa (1931), and Nagoya (1931) were established before World War II.

The Meiji government chose to emulate not the American higher education system, but the highly selective elite system prevailing in Germany at Berlin University[5] and in England. Neither the government nor Ministry of Education (*Monbusho*) took action to develop equality of opportunity to higher education for people, and instead expected and emphasized duty to the empire and cultivation of a strong sense of broader responsibility as the nation's elite.[6]

There was another role of universities in the period—as the research arm of Japan, universities were expected to support R&D for emerging Japanese companies and the Imperial Army. There are many examples of "coupled systems" for R&D among universities, businesses, and the military. Ichisuke Fujioka, associate professor of Tokyo Imperial University, quit the university and joined newly established Tokyo Electric Lighting Co., Ltd. (the first electric power company in Japan) in 1883 and worked as CTO. In 1990, he launched Hakunetsu-sha, Inc., one of the precursors of Toshiba Corporation. Professor Nagayoshi Nagai of Tokyo Imperial University served as CTO of Dainippon Pharmaceutical Co., Ltd. for eight years. Yuzuru Hiraga, vice admiral of the Imperial Navy, was appointed as the 13th president of Tokyo Imperial University after a 37-year military career as a prominent shipbuilding engineer. RIKEN, the renowned public research institute founded in

[5] The Japanese higher education before World War II came under strong influence of educational philosophy of Wilhelm von Humboldt (1767 – 1835), Prussian minister of education, founder of Humboldt University in Germany. His influence continued over a century in Japanese universities. The principles common in Japanese universities, such as freedom of learning, autonomy of universities and research universities, were based on Humboldt's writings and remarks.

[6] Higher education before WWII includes non-imperial universities and professional schools. Keio University was started as private school (juku) in 1858, and such school as Chuo (1885), Waseda (1920), Hosei (1920), Nihon (1920) were established for the need of professional education and later they are was reorganized from professional schools to the universities. In 1945, there were 30 private universities and 15 non-imperial public universities in Japan.

1917, launched 63 private companies who operated 121 factories,[7] including the world's first producers of vitamin A, magnesium, and synthetic sake.

2.2 After the War: Academic Freedom

After the World War II, the new education system introduced by the Supreme Commander of the Allied Powers, known as GHQ in Japan, aimed to demilitarize, democratize and decentralize the Japanese governmental structure. The new education model emulated the American pattern, with the six years of compulsory elementary school, three years of compulsory junior high school, three years of senior high school, and four years of university or college. Under the GHQ, the U.S. Education Mission to Japan in 1946 submitted its first report to the Japanese government. On the principle of "equality of opportunity on education" for the general population, the report suggested that higher education should be free from government and ministry control, that professors should be guaranteed financial and academic freedom, and that students should be free to pursue higher studies of every kind based on their ability.[8]

Thus Japanese universities managed to obtain autonomy from Imperial government control not by their own power but with the help of American authorities. Unlike American universities, most of which are private schools, Japanese national universities are officially operated as public institutions and are dependent on the full- financial support of the government.

Japanese universities carried another legacy: the influence of German educator Humboldt[9] and an anti-militarism stance after the war, which made them indifferent to the commercialization of academic results and unwilling to raise money for their activities. The people who championed the freedom of learning had a tendency to assess industry-university co-operation (*sangaku renkei*) in the wrong way. Some at universities, especially students[10], belittled sponsored research as a "cozy relationship" and "dirty money."

When we look back on Japanese society from the 1950s to 1970s, the first and most pressing need with respect to universities was to accommodate the growing number of students on campuses. As one of the factors driving Japan's rapid postwar economic growth, the number of students in higher education increased from 240,000 in 1950 to 2.25 million in 1980. The number of schools grew from 201 universities and 149 junior colleges in 1950, to 446 universities and 517 junior colleges in 1980.[11] Universities changed drastically from being privileged facilities for the elite to public places for learning. The top priority for universities became processing a large "quantity" rather than how well they could teach students or what courses of study they could offer; universities had to ensure there were enough places to accommodate the increasing number of new students, and to supply enough

[7] The history of RIKEN. http://www.riken.go.jp/r-world/riken/history/zaidan/index.html

[8] Report of the U.S. Education Mission (USEM) to Japan (1946).

[9] See note 5.

[10] In 1960s and 1970s, Japanese student radical activism condemned industry-university co-operation.

[11] Number of students, universities and colleges are quoted in "Basic Survey on School, METI".

graduates to business. With growth of the student population and funding base, Japanese universities did not find a real necessity to raise money through industry-university cooperation or to provide practical education.

Meanwhile, Japanese companies did not expect much from the pragmatic activities of universities. Most companies, especially big companies, tried to secure the necessary number of graduates with the main qualification being only the aptitude to work. Companies organized their research laboratories[12] and corporate training programs to be self-sufficient. In conducting in-house practical training for new employees, companies expected employees to develop skills and specialties through long-term on-the-job training.

Thus over the decades, Japanese universities were able to remain free and noble. Professors were unwilling to yield internal policy making authority to the government or non-academic world, and were proud and content to stay inside the ivory tower without knowing anything about the business world.[13]

2.3 Government Led University Reform

Japanese business society and the government took a critical stance toward the negative and non-cooperative response of universities to commercialization. Although they issued many reports and proposals to promote cooperation[14], they did not find an opportunity to solve the problem until the 1980s.

Like many other countries around the world, the Japanese government has for a couple of decades sought to reform its system of higher education. The Ad Hoc Council on Education (*Rinji kyoiku shingi-kai*), which was set up in August 1984 as a cabinet level advisory committee to the Japanese prime minister, initiated a discussion on educational reform from a long-term perspective with the support of all relevant government authorities. After three years of deliberation, the council submitted its reports to the prime minister, in which the council highlighted three key words for university reform: liberalization, diversification and internationalization.[15]

University reform accelerated in the context of the series of economic recessions since the early 1990s. When Junichiro Koizumi became prime minister, he pushed through a series of structural reforms to revitalize the stagnant Japanese economy, including the overhaul of the Japanese bureaucracy by introducing "independent administrative corporations" (*Dokuritsu gyosei hojin*) to change how bureaucrats are employed and how they work.

Higher education, particularly at national universities, rose to the forefront of these reforms. National universities were required to improve their administrative efficiency, quality assurance, and accountability in response to the demands of stakeholders such as government, business, and the general public, in addition to students and parents. In June

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[12] During 1950s and 1960s, 250 Japanese companies founded corporate research laboratories. Source: Ishigami (1986).

[13] Kawashima (2009), p. 91.

[14] Iiyoshi (2006), p. 30.

[15] See Okada (2003).

2001, Atsuko Toyama, minister of MEXT (Ministry of Education, Culture, Sports, Science and Technology) announced the "Structural Reforms Policies for National Universities" (*Toyama Plan*), which called for a panel of experts to reorganize national universities into independent administrative corporations. Table 2 shows three core proposals of the Toyama Plan, also known as the "Big Bang in Japanese Higher Education". In April 2004, all 86 national universities were reorganized into "national university corporations". Since then, the university corporations are operated as if they belonged to the private sector.

2.4 Technology Transfer in Japanese Universities

The reform of Japanese higher education significantly heightened expectations regarding the commercial and competitive value of universities. In particular, government bureaucrats (mainly MEXT and METI[16]) wanted to turn around Japan's stagnant technological competitiveness by promoting industry-university cooperation during the 1980s and 1990s. Through policies and actions, the government stressed the expansion of technology transfers from universities to businesses. This stance that was strongly affected by the situation at American universities, where the Bayh-Dole Act of 1980 helped increase the number of technology licensing offices (TLOs) of universities to 125 by 1995. Many well-informed persons in this field agree on the positive impact of the act for industry-university cooperation and technological competitiveness of the U.S. Although not a few people in universities were opposed to the cooperation[17], the Japanese government studied the results of the Bayh-Dole Act and took actions to introduce a similar act for Japan's academic sciences.

In 1995, the Basic Act on Technology (*Kagaku gijustu kihon ho*) was passed in the Japanese Diet. This act elevated the promotion of technology to a national priority, with the plan to promote industry-university co-operation for universities by obtaining more funding from national budgets. In 1997 and 2000, the government eased regulations on commercial activities of professors in national universities, which enabled them to engage in consulting businesses and serve as corporate directors.

In 1998, the TLO Act (*Daigakuto gijutsu iten sokushin ho*) was enforced. The act de-regulated licensing and commercial businesses of Japanese universities, and 27 TLOs were founded in universities in the five-year period after 1998 (Figure 1). In fact, the number of research projects between Japanese universities and companies doubled from 7,248 in 2003 year to 14,974 in 2008[18]. Without doubt, the commercialization of technology has permeated Japanese universities, quite unlike the case from 40 years ago.

2.5 Promotion of University-Oriented Ventures

In January 2001, METI launched an internal section for collaboration with

[16] The Ministry of Economy, Trade and Industry (METI).

[17] The influence of student activism can be seen in the persistent opposition to university reform and industry-university cooperation in universities. The labor unions of universities remained strongly opposed the reform.

[18] MEXT, 2010, "Survey of Industry-University Cooperation."

universities. The section started to enhance cooperation between university, industry and government. In May 2001, Takeo Hiranuma, minister of METI, announced the "*Hiranuma Plan*" to create new jobs and markets, which included a target to increase the number of business start-ups from universities to 1,000 during the next three years. Known as METI's "University Ventures" plan, it helped to accelerate the pace of business start-ups in universities. Figure 2 shows the number of university-oriented ventures in Japan as counted by METI. The number of foundations has decreased from 2004 to the present, but the cumulative number of university-oriented ventures is 1,809, which exceeds the target of the Hiranuma Plan. Of these, 1,208 companies (69%) are from national universities including Tokyo (125), Tsukuba (76), and Osaka (75) universities. The information & technology sector comprises 40% of total ventures, and the bio-medical sector 35%.

Looking back on the decade from 1995 to 2004, we must acknowledge that Japanese ministries were active sponsors and supporters who promoted commercialization in universities, regardless of whether the policies were successful or not. On the backs of these supporters, Japanese universities have pushed forward time-consuming reform of the antiquated structure that encouraged self-indulgent academic research.

3. How is Entrepreneurship Being Taught in Japanese Universities?

Japanese students are rarely taught entrepreneurship. Very few teachers from elementary schools to universities ever say the word "challenge" in classrooms. Most Japanese people admit that they do not think it is positive or admirable to take risk to challenge, which is one of the most important ways of behavior and thinking in American society.

The basic starting point of entrepreneurship education is for every student to discern their own view of life and goals. Entrepreneurship changes the way we work, the way we communicate, and the way we live. Entrepreneurs take risks to develop novel enterprises, new or improved products, service, or mode of organization that can exist independent of its originator. The return earned by entrepreneurial challenges benefits our economy and society.

Entrepreneurship education merges the visionary and the pragmatic. It requires knowledge, imagination, perception, practicality, persistence, and attention to others. But, we must also admit that universities in Japan only tend to teach students pragmatic techniques with which they can launch ventures, develop products and raise money. Academic papers on contemporary entrepreneurship or ventures were not written until the 1970s. In 1970, Kiyonari (1970) introduced the word "venture"[19] from the U.S. to Japan, and some researchers whose major was small business[20] discussed the high-growth enterprises

[19] In 1970, Kiyonari and other researchers coined the neologism "venture business" in Japanese, referring to a new type of emerging small companies. See Yamazaki (2003)

[20] For example, In Japan, small business researchers wrote 7 of all 9 articles (books) with title of "venture" during 1970-73. The data was searched using Google Scholar.

of the new era. The first MBA entrepreneurship course started at Harvard University[21] in 1946, and much later than Harvard, Hosei Business School launched the first Japanese entrepreneurship course in 1992. During the 1970s and 1980s entrepreneurship and ventures were not taught as a separate subject in Japanese university's curriculum, but instead referred to sporadically in lectures on small business in universities.

Policies have had the impact of stimulating Japanese education on entrepreneurship. METI, which has been promoting TLOs and university-based ventures, started a project[22] to permeate entrepreneurship education into Japanese universities in 1999.

3.1 Growth of Entrepreneurship Programs

The survey report by METI and DIR in 2009[23] shows the current status of entrepreneurship programs in Japanese universities. In Japan, 247 universities (46% of all 536 universities[24] responded) have some sorts of programs or courses related with entrepreneurship. 55 universities (10% of all responded) have full-scale courses for entrepreneurship; 34 universities have full-scale courses at graduate schools and 30 at undergraduate schools. In America, Katz (2003) reports more than 2200 entrepreneurship courses in the U.S.

As for number of subjects with entrepreneurship, there are 405 subjects at graduate schools and 523 at undergraduate schools. The total 928 subjects is less than one-fifth of America's; Kauffman Foundation[25] reported that more than 5000 subjects are taught in American universities and colleges.

Figure 3 shows that the number of universities with entrepreneurship programs in the 2009 survey increased by 77% compared with another survey[26] taken in 2000. However, we cannot say whether all entrepreneurship subjects taught at the above universities have an adequate content. Figure 4 shows the number of universities by number of entrepreneurship subjects. Only one entrepreneurship subject is taught at the graduate level in 52 out of 126 universities, compared to 83 out of 200 universities at the undergraduate level. We can unequivocally state that it is insufficient for universities to provide only one subject on entrepreneurship.

Table 3 shows the top 20 universities by number of "entrepreneurship subjects." They are mainly large-scale universities: Keio, Ritsumeikan, Tohoku, Waseda, Nihon, etc. Some smaller schools such as Josai International, Kochi University of Technology, Graduate Institute for Entrepreneurial Studies, and SBI Graduate School are strengthening and featuring entrepreneurship programs.

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[21] Katz (2003), p. 286.

[22] In 1999, METI started the project "*Sendoteki kigyoka ikusei system jissho jigyo"* to support entrepreneurial education at five selected universities (Tokyo, Hosei, Hokkaido, Ritsumeikan and Waseda). The total budget of the project was approximately 120 million yen.

[23] METI/DIR report (2009).

[24] There are 758 universities in Japan at the end of 2009, consisting of 86 national universities, 77 non-national public universities, and 595 private universities.

[25] See Kauffman Foundation (2009), p. 16.

[26] MEXT's survey on entrepreneurship programs in Japanese Universities in 2000.

3.2 Increase of Academic Articles

Since it is difficult to evaluate research activity, we can instead count the number of academic articles related to entrepreneurship. Figure 5 shows the number of academic articles in Japan which contain the word "Entrepreneurship" or "Venture" in the title. The two line charts count articles by year of issue from Google Scholar and CiNii.[27] They show an unprecedented growth of articles in the late 1990s and decline in the past four years. Japan's third "venture boom" in the late 1990s is reflected in the charts.

It was not only in Japan that a big increase occurred. In the U.S., the number of articles increased steadily in the 1980s, 1990s, and this 21st century (Figure 6), and the real number is likely far more than the Japanese articles. Table 4 shows a global comparison of academic articles which contain the word "Entrepreneur" or "Venture" in the title. The growth in number occurred in all countries shown in the late 1990s. China, America and Korea show a big increase in numbers, while Japan and Germany are far less than the three countries. Additionally, the number of Chinese academic articles containing "Entrepreneurship Education" in the title and issued in 2009 is 170, which is surprising growth compared with almost zero[28] in the 1990s.

3.3 Other Characteristics

Exogenous movement

Entrepreneurship education in Japanese universities started in the late 1990s as a result of the politically motivated promotion of industry-university cooperation, TLOs and university-oriented ventures. Thus it was not an endogenous movement in universities; rather, entrepreneurship education has been mainly supported by the government. And being a new and developing area at most universities, entrepreneurship education still actually consists of add-on courses or internship programs to supplement existing programs.

We should point out the fact that the government, in promoting university reform, encourages universities to compete in terms of numerical targets for research projects, ventures, or entrepreneurship lectures. As a result, entrepreneurship education programs face the following two challenges.

Development of content

Entrepreneurship education requires various kinds of intellectual viewpoints and pragmatic knowledge. It is not sufficient to teach how to write a business plan, nor to prepare guest lectures by entrepreneurs and venture capitalists. Entrepreneurship education in universities should not only the outline of entrepreneurship, but also teach

[27] CiNii is a database service of information on academic and business articles published in Japan. It is operated by the National Institute of Informatics (NII).

[28] The Chinese academic articles with the title of "Entrepreneurship Education" issued in 1990's are 8. These results are counted by Google Scholar.

about Venture Growth Strategies (strategy), Financing Ventures (finance), Product Development for Ventures (product development), Marketing for Entrepreneurs (marketing), Social Entrepreneurship (social and family business), Corporate Entrepreneurship (corporate), and so on. Japanese universities need to design entrepreneurship education to address basic issues such as how entrepreneurship affects the values we live by, and how achieving personal goals can lead to producing meaningful results for the global entrepreneurial economy.

Lack of faculty and course materials

In addition, universities must develop teaching staff, teaching materials, and networking capabilities. In the U.S., Katz (2003) referred to a lack of faculty on entrepreneurship education, meaning that the rapid growth of education has outstripped the supply of courses and faculty. Likewise, in Japan, there are few professors or associate professors whose field is entrepreneurship. "Flexible" adjunct teachers who specialize in fields related to entrepreneurship such as small business or MOT (management of technology) provide most of the lectures on entrepreneurship. Course materials are another area in need of development. There are few books and textbooks originally written for Japanese entrepreneurship education. When we browse websites on entrepreneurship education and related programs, it is rather difficult to find good syllabuses, resumes and handouts. But this shortage is not only in Japanese education. Entrepreneurship education worldwide needs to aggressively grow course materials and faculty from the ground up.

4. Discussion and Implications

Broader meaning of entrepreneurship

As recognition of the importance of pragmatic core-competence spreads to higher education around the world, education and research activities on entrepreneurship are being introduced not only to business departments but also to engineering, bioscience, social studies and other departments of universities. As I showed in Table 4, Chinese research articles on entrepreneurship are exploding, and it is easy to imagine that the role of entrepreneurship in the modern economy is attracting academic attention in emerging countries such as China, India and Russia.

In light of this trend, entrepreneurship in Japanese universities will not be limited only to commercializing intellectual activities, but will become an important and influential axis for developing the "competence" of students and researchers. The importance of competence to individuals and society is widely recognized throughout the world[29]. Entrepreneurship in universities is well harmonized with this competency-based education.

[29] For example, "DeSeCo" (Definition and Selection of Competencies) project held by OECD from 1997 to 2003 describes competence for the global society, and "A Nation at Risk", the 1983 report of American President Ronald Reagan's National Commission on Excellence in Education referred to the competency.

Realizing any business goal requires the cultivation of general and practical competence in communication, leadership, teamwork, and motivation. These competencies are not limited to entrepreneurs and venture enterprises. Education to develop both entrepreneurship and competence is insufficient in Japanese universities. We should build a much broader target for university entrepreneurship, one that will be supported and appreciated by the greater society.

Still minor, developing and changing

As I mentioned in 3.3, entrepreneurship in Japanese universities can be characterized as exogenous, premature and adjunct. Actually, it was in the last decade that entrepreneurial activities spread in universities. As for entrepreneurship education in America, where Myles Mace[30] started the first entrepreneurship course at Harvard Business School in 1947, Vesper (1999) stated, "Entrepreneurship in universities has so far been developed as an add-on to business education, first as an elective course, then more courses, and finally as a concentration, major or program. So far it has largely been tucked in around the existing core. Its teachers presently must be approved by established faculty of other fields. Its courses currently must fit into the existing curriculum, grading system and calendar. It serves the students who for the most part apply for a conventional business education."[31]

Most of the trials in Japanese universities are at such an "add-on" stage as Vesper describes. Not only in Japan, but in universities around the world, entrepreneurial activities are not established yet and are still developing and changing. They are exploring the untapped edges of universities, even if they are still small and different from the mainstream.

[30] Katz (2003), p. 286.

[31] Vesper (1998), p. 15.

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Table 1 Chronology of Universities in Japan and America

year	Japan	year	America
1684	Astronomy research group of Edo government (Tenmon-gata, origin of Tokyo University) founded.	1636	Harvard University founded.
1858	Yukichi Fukuzawa founded a Private School (Keio Gijuku, origin of Keio University) .	1865	MIT founded.
1868	<Meiji Restoration>	1868	University of California founded.
1877	Tokyo University founded.		
1883	Professor Ichisuke Fujioka quit Tokyo University and joined newly established Tokyo Light Power Co., Ltd.		
1886	Tokyo University reorganized and named Imperial University.	1891	Stanford University founded.
1897	Kyoto Imperial University founded.		
1919	The University Act was enforced. 11 private schools (Keio, Waseda, Chuo, etc.) changed to universities.	1939	Stanford graduates Hewlett and Packard founded HP by professor's advice.
1945	Masao Horiba, Kyoto imperial university student, founded Horiba laboratory, Inc. (origin of Japanese student venture).	1945	The Patent, Copyright and Licensing Office established at MIT Division of Sponsored Research (origin of MIT's TLO).
1945	The End of World War II		
1946	The U.S. Education Mission sent to Japan.	1946	Harvard former Dean Georges Doriot founded the first venture capital (ARDC).
1947	The Basic Act on Education (Gakkou Kyouiku-hou) was enforced to reform the pre-war Japanese education system.	1947	Management of New Enterprise, the first MBA Entrepreneurship course at Harvard.
	Student activism spread in Japan (1960-70).	1957	ARDC supported MIT graduate Ken Olsen to start Digital Equipment Corp.
1964	Nakamura Hideichiro published "Medium-sized companies".	1963	First endowed position on Entrepreneurship at Georgia State University.
		1967	First contemporary MBA Entrepreneurship courses at Stanford & New York Universities.
1970	Tadao Kiyonari introduced the word of "venture" to Japan. First academic article on contemporary Entrepreneurship.	1970	TLO of Stanford University founded.
1971	Nakamura, Kiyonari and Hirao wrote "Venture Business". First book on contemporary Entrepreneurship.	1972	First undergraduate concentration on Entrepreneurship at University of Southern California.
		1974	Entrepreneurship Division of the Academy of Management formed.
		1975	Bill Gates quit Harvard to start Microsoft.
		1980	The Bayh-Dole Act.
		1982	Stanford associate professor Jim Clark along with several Stanford graduate students formed Silicon Graphics.
		1983	First Entrepreneurship course in an Engineering School, University of New Mexico.
1984	The Ad Hoc Council on Education (Rinji Kyoiku Shingi-kai) started.	1984	First business plan competitions at Babson College and University of Texas-Austin.
		1985	TLO of MIT founded.
1991	The Standards for the Establishment of Universities (Daigaku Secchi Kijun) was made relaxed to reform higher education.	1990	The MIT/Stanford Venture Lab (VLAB) founded.
1992	First Entrepreneurship course at Hosei Business School.		
1993	Waseda University Entrepreneurial Research Unit (WERU) founded.		
1995	The Basic Act on Technology (Kagaku Gijustu Kihon-ho).	1995	Stanford graduate students launched Yahoo!.
1997	The Japan Academic Society for Ventures and Entrepreneurs formed.	1996	MIT Entrepreneurship Center launched.
1998	The TLO Act (Daigakutou Gijutsu Iten Sokushin-ho).	1996	Center for Entrepreneurial Studies of Stanford founded.
1998	First Japanese TLO founded.	1998	Stanford graduate students Larry Page and Sergey Brin founded Google.
1998	WERU Investment Co, Ltd. Founded (First university-based venture capital).		
1999	The Sangyo Katsuryoku Saisei Tokubetsu Sochi-hou Act. Introduced rules of the Bayh-Dole Act to Japan.		
1999	METI started "Sendoteki kigyoka ikusei system jissho jigyo" to support entrepreneurial education in universities.		
2000	The Sangyo Gijutsuryoku Kyoka-ho Act to relax regulation of professor's commercial activities in national universities.		
2001	Structural Reforms Policies for National Universities (Toyama Plan).		
2001	METI launched a section for collaboration with universities.		
2001	"Hiranuma Plan" to increase university ventures.		
2004	All 86 national universities were reorganized to national university corporations.	2004	Harvard student Mark Zuckerberg with his college roommates founded Facebook.
2005	First undergraduate Entrepreneurship program at Ritsumeikan University.		

Source: Entrepreneurship Education Chronology, Saint Louis University. http://www.slu.edu/x17962.xml

Note: The above facts are related to policies (shaded) and entrepreneurship in universities.

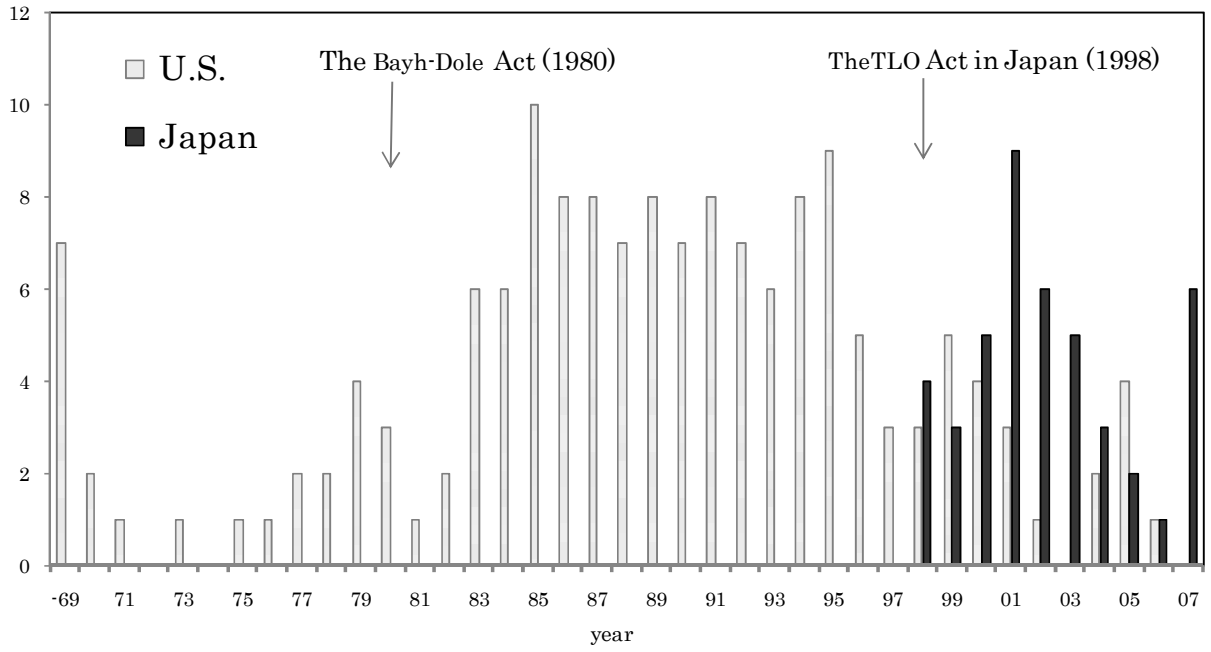
Table 2　Three ore Principles of "Toyama Plan"

(Principles of structural reform of national universities, MEXT, June 11, 2001)

1. Take bold steps to reorganize and combine national universities
○Reorganize and combine based on the conditions at each university and each sector
・Reduce and reorganize the system for training educational personnel
・Merge single curriculum universities such as medical schools with other universities
・Reorganize and merge universities and faculties into units covering more than one prefecture
○Aim to largely reduce the number of national universities
→Revitalize national universities using scrap and build method
2. Introduce management method based on private -sector concepts in national universities
○Employ outside specialists as university administrators and in the management organization
○Operate universities properly and strategically by defining management responsibility
○Introduce a new personnel system based on rewarding ability and performance
→Shift promptly to new university corporations
3. Introduce principles to competition in universities by third party evaluations
○Introduce a third party evaluation system consisted by specialists and private sector personnel
○Fully disclose the results of the evaluations to the citizens and society, including students, companies and organizations providing assistance
○Give priority to fund distribution based on the evaluation results
○Expand competitive funding among national, public private universities
→Develop the Top 30 Japanese universities into institutions conforming to the highest international academic standards

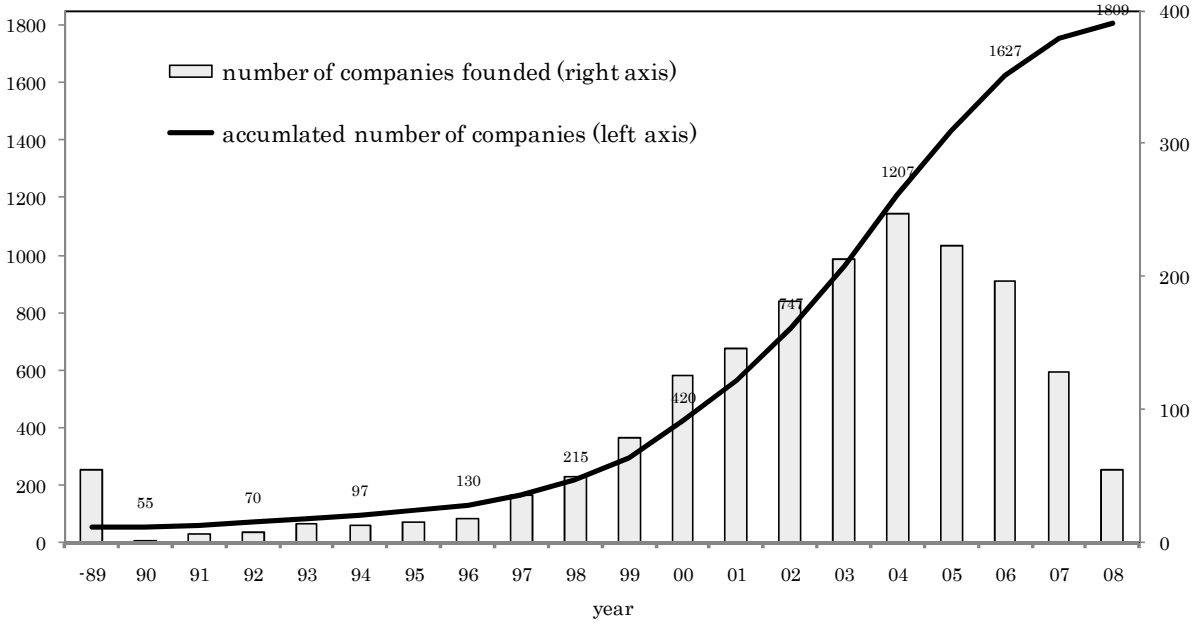
Source: MEXT announcement.

Figure 1　Number of TLOs Established by Universities



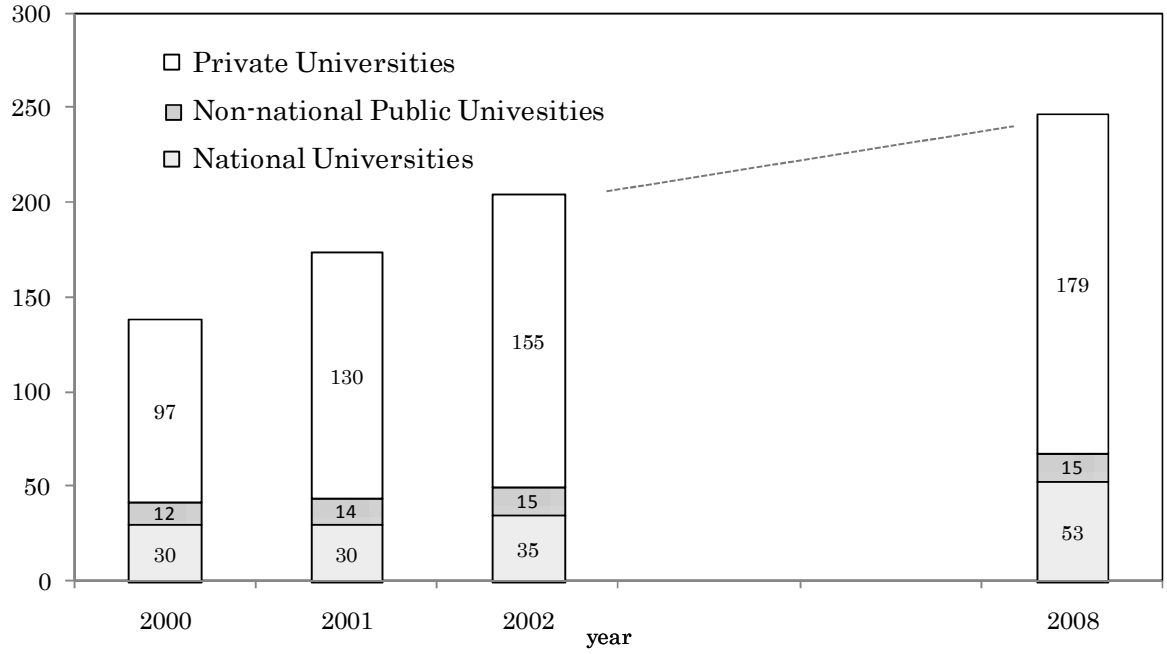
Sources: Association of University Technology Managers, *FY 2006 Licensing Survey*, and METI report.

Figure 2　Number of University-Oriented Ventures in Japan



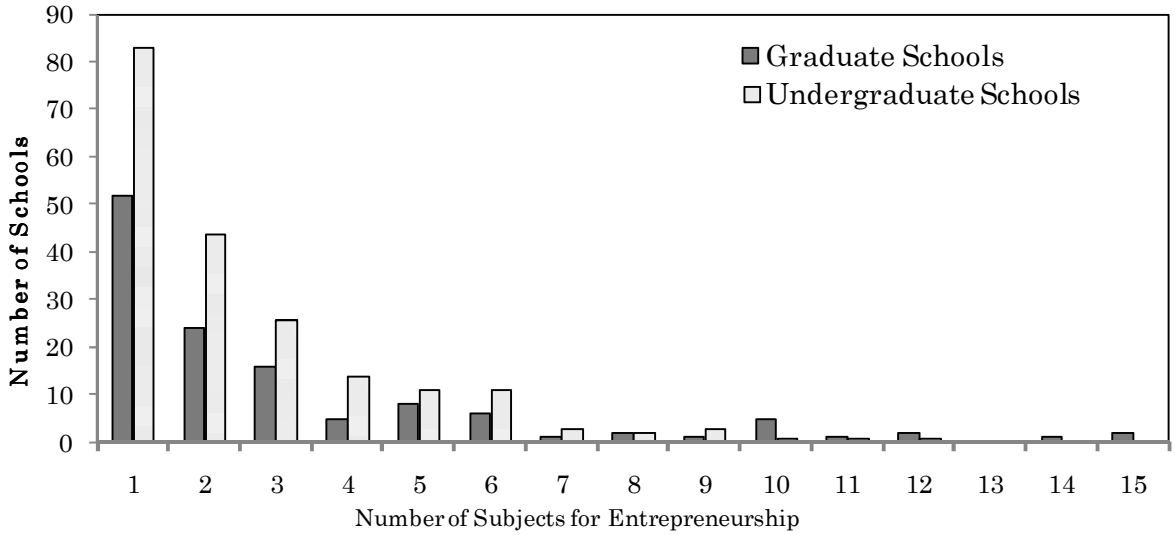
Source: METI, *Basic Survey of University-Oriented Ventures (2008).*

Figure 3　Number of Japanese Universities with Entrepreneurship Education



Source: METI and DIR, *Survey Report on Entrepreneurship Programs in Japanese Universities (2009).*

Figure 4　Japanese Universities by Number of Entrepreneurship Subjects



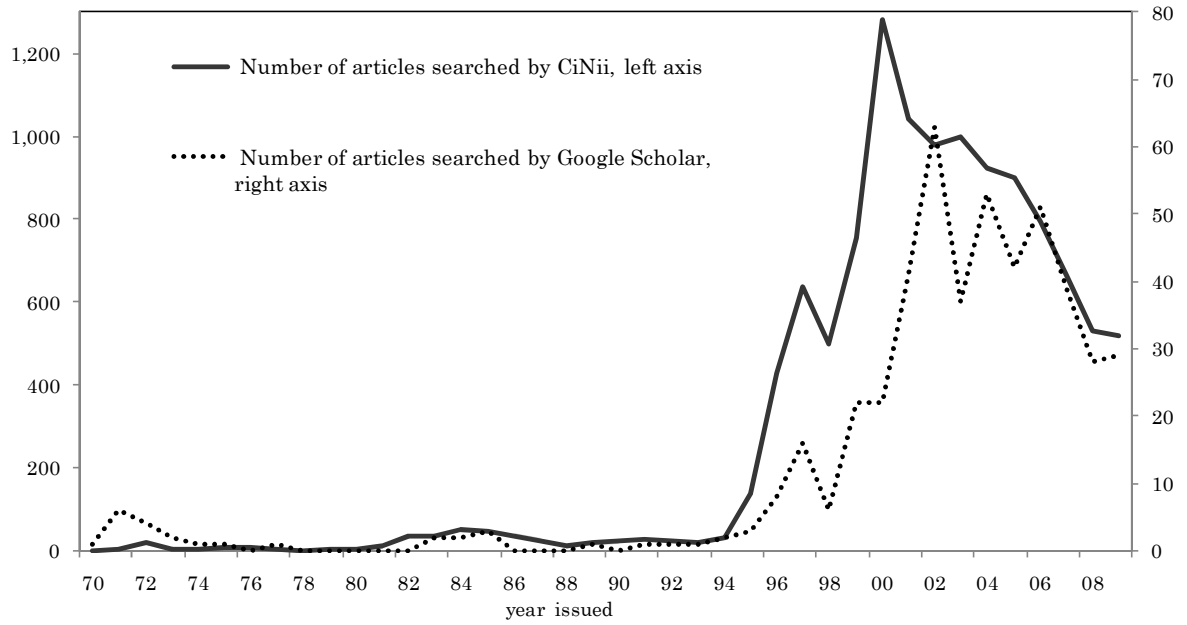
Source: METI and DIR. *Survey Report on Entrepreneurship Programs in Japanese Universities (2009).*

Table 3　University Ranking with number of subjects for Entrepreneurship

Name of university		Prefecture	Number of subjects			Course for Entrepreneurship	Other programs & events without subjects				
			Under-graduate (a)	Graduate (b)	(a)+(b)		Seminar or Symposium	Business Plan Contest	Internship	Business Incuba-tor	Other
Keio	P	Tokyo	13	12	25		×	○	○	○	×
Miyagi	Pu	Miyagi	8	14	22	○	−	−	−	−	−
Ritsumeikan	P	Kyoto	14	8	22	○	○	○	○	○	×
Josai International	P	Chiba	3	17	20	○	○	×	○	×	×
Kochi University of Technology	P	Kochi	2	15	17	○	○	×	×	×	×
Tohoku	N	Miyagi	6	10	16		○	○	○	○	×
Waseda	P	Tokyo	6	10	16		○	×	○	○	×
Nihon	P	Tokyo	5	9	14	○	○	×	×	×	×
Kumamoto	N	Kumamoto	4	10	14	○	○	×	×	○	×
Osaka University of Economics	P	Osaka	12	1	13		×	○	×	×	×
Kansei Gakuin	P	Hyogo	2	11	13	○	○	○	×	×	×
Meiji	P	Tokyo	9	3	12		×	×	×	×	×
Graduate Institute for Entrepreneurial Studies	P	Niigata	0	12	12	○	×	×	×	×	○
Meisei	P	Tokyo	9	2	11		×	○	○	×	×
SBI Graduate School	P	Kanagawa	5	6	11		×	×	×	×	×
Tokyo University of Agriculture & Tech.	N	Tokyo	0	10	10		○	×	×	×	×
Tokyo University of Technology	P	Tokyo	3	7	10	○	×	×	×	×	○
Yamanashi Gakuin	P	Yamanashi	10	0	10		×	×	×	×	×
The Graduate School for the Creation of New Photonics Industries	P	Aichi	0	10	10	○	○	×	×	○	○
Aichi Gakuin	P	Aichi	10	0	10		×	×	×	×	×
Kyushu Institute of Technology	N	Fukuoka	0	10	10		○	○	×	×	×

Source: METI and DIR, *Survey Report on Entrepreneurship Programs in Japanese Universities (2009).*
Note:　1. P: private university, Pu: public, N: national.　　2. ○: yes, ×: no, −: no answer

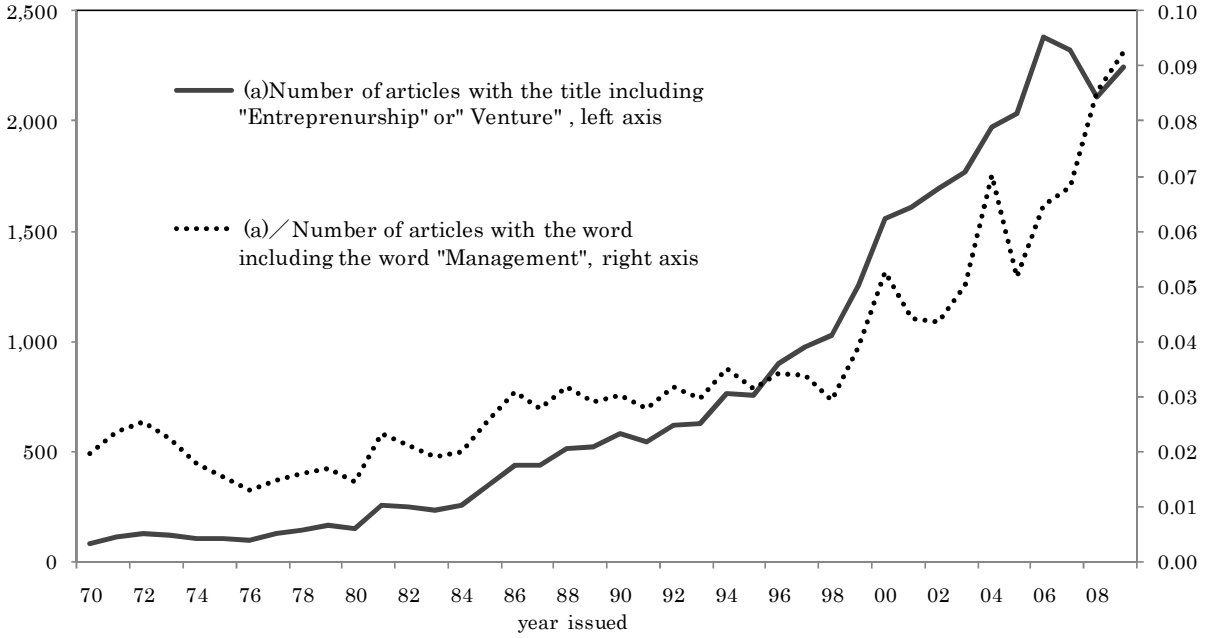
Figure 5　Number of Academic Articles with "Entrepreneurship" or "Venture" in the Title (Japan)



Source: CiNii of National Institute for Informatics and Google Scholar Search.

Notes: 1. Number of articles is counted by year issued.　2. Basically, the Google Scholar database contains academic articles and books, but the CiNii database includes business articles.

Figure 6　Academic Articles with "Entrepreneurship" or "Venture" in the Title (America)



Source: Google Scholar Search.

Note: Number of articles is counted with Google Scholar Search by year issued.

Table 4　Academic Articles with "Entrepreneur" or "Venture" in the Title

Year issued	Language								
	English	Chinese -Simplified	Japanese	Korean	German	Russian	Spanish	Portuguese	French
1970	82	0	1	2	5	0	0	0	2
1971	110	0	6	0	18	0	0	0	1
1972	130	0	4	0	18	0	0	0	3
1973	122	0	2	2	14	1	0	0	3
1974	106	1	1	1	6	0	0	0	0
1975	106	2	1	2	14	0	0	0	7
1976	101	4	0	2	13	0	1	0	0
1977	127	4	1	1	15	3	0	0	4
1978	145	1	0	2	4	5	0	0	1
1979	165	1	0	5	17	0	0	0	3
1980	152	7	0	7	4	0	0	0	2
1981	255	3	0	2	12	1	0	1	2
1982	250	1	0	7	10	0	0	0	8
1983	237	3	2	20	9	0	0	0	3
1984	258	8	2	2	8	0	0	0	7
1985	350	18	3	10	19	0	0	0	10
1986	439	27	0	13	15	1	2	0	8
1987	436	26	0	10	18	1	2	0	5
1988	516	51	0	15	16	7	1	0	4
1989	522	128	1	23	21	2	2	1	9
1990	579	62	0	27	27	2	4	0	24
1991	545	80	1	36	35	21	6	1	8
1992	621	91	1	51	36	34	1	0	16
1993	629	120	1	66	34	29	7	1	19
1994	764	266	2	82	40	50	5	0	26
1995	758	435	3	101	41	40	10	1	31
1996	897	478	8	132	53	55	6	3	24
1997	978	485	16	170	57	60	19	3	38
1998	1,026	595	6	221	55	46	15	6	33
1999	1,257	923	22	273	83	49	25	13	70
2000	1,554	2,350	22	287	97	72	32	16	77
2001	1,608	3,100	41	293	74	96	45	31	39
2002	1,692	3,230	63	324	90	76	41	44	66
2003	1,766	4,230	37	374	87	81	23	60	51
2004	1,975	4,870	53	410	82	105	61	52	67
2005	2,034	5,280	42	386	92	90	52	55	73
2006	2,379	5,410	51	509	77	105	69	50	73
2007	2,323	6,220	39	517	75	107	75	54	60
2008	2,108	6,810	28	410	74	88	60	57	78
2009	2,245	9,470	29	378	43	91	49	62	67

Source: Google Scholar Search.

Note: 1. Number of articles is counted by titles which contain the following words:

-English:　entrepreneurship or venture.

-Chinese-Simplified:　"企业家" (entrepreneur) or "创业" (venture).

-Japanese:　"起業" (entrepreneurship) or "ベンチャー" (venture).

-Korean:　"창업" (entrepreneurship) or　" 벤처" (venture) .

-German:　"unternehmer" (entrepreneur) or entrepreneurship.

-Russian:　"Предпринимательство" (entrepreneurship) or "Предприниматель " (entrepreneur).

-Spanish:　"emprendedor" or "emprendedora " (entrepreneur).

-Portguese:　"empreendedorismo " (entrepreneur).

-French:　"entrepreneur " or "entrepreneuriat " (entrepreneur).

2. As Google Scholar searches academic articles on the automatic and electronic method, its result may have a few errors, such as miscounts of year.

3. The result of Chinese-Simplified from 2000 to 2009 year is counted approximately.