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Seeking Modernity, Brain Gain, And Brain Drain: The Historical Evolution of Chinese Students' Overseas Education in the United States Since Modern China

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SEEKING MODERNITY, BRAIN GAIN, AND BRAIN DRAIN: THE HISTORICAL EVOLUTION OF CHINESE STUDENTS' OVERSEAS EDUCATION IN THE UNITED STATES SINCE MODERN CHINA

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ABSTRACT

China is currently the largest provider of international students to the United States. According to the newly released Open Doors Report, in 2012, China sent 194,029 students to the U.S., remaining the leading place of origin for students coming to the United States.[1] The history of Chinese students studying in America could date back to the mid-nineteenth century. It then experienced vicissitudes following the historical evolution of modern Chinese history. This thesis is an historical research project that examines major waves of Chinese students studying in the United States since the mid-nineteenth century. It will also examine the impact of returned, American-educated Chinese students to the modernization of Chinese society. It in the end will discuss the trend and pattern of the current wave after 1978 and compare it with the previous waves. The analysis and examination of this thesis is based on a wide variety of written documents in both Chinese and English, including historical literatures, academic articles, dissertations, surveys, government publications, statistical data from both primary and secondary sources, as well as educational organization records.

[1] Institute of International Education (IIE), " Fact Sheets by Country: China, 2012," Open Doors Report 2012, http://www.iie.org/Research-and-Publications/Open-Doors/Data/Fact-Sheets-by-Country/2012

SEEKING MODERNITY, BRAIN GAIN, AND BRAIN DRAIN: THE HISTORICAL EVOLUTION OF CHINESE STUDENTS' OVERSEAS EDUCATION IN THE UNITED STATES SINCE MODERN CHINA

Introduction

The history of Chinese students studying in America has always maintained a significant position in the history of Chinese students' overseas education first emerged in the mid-nineteenth century. Many scholars and historians tend to divide this history into different periods or waves based on the critical historical evolution in modern Chinese history: The Late Qing Period: 1847–1911, The Early Republican Period: 1912–1928, The Nationalist Government Period: 1928–1949, and the Reform and Open Door Policy Period: Post 1978 (According to Open Door Report, China sent no students to the U.S. from the 1950s until 1974/75). While in each period the American-educated Chinese always made significant contribution to China's modernized transformation, the pattern and trend of Chinese students' education in the U.S. in the current wave begun at 1978 was distinct from that of the waves before 1949.

In general, before 1949, most American-educated Chinese were government – supported, and most of them returned to China after graduation. Furthermore, students in the waves before 1949 studied wide range of subjects including Political Science, Social Science, Sociology, Education, Economics, Business, Humanities, Law, Music, Military Affairs, Medicine, Agriculture, Natural Science, and Engineering etc. However, in the

post 1978 wave, the self–supported students accounted a significant portion in the overall American-educated Chinese population, and the return rate in this wave gradually reduced. In addition, there was a disproportionally high amount of students pursuing the subjects categorized as STEM (Science, Technology, Engineering, and Mathematics).

While the history of Chinese students' overseas education in the United States have been studied by previous scholars and historians, almost none touched on the comparison between the current wave of post 1978 and previous waves. In that case, the examination of the historical evolution of Chinese students' overseas education in the United States will be conducive to understand firstly the social impact brought by the Chinese students who studied in America to their mother country in each critical transformation period in modern Chinese history; secondly the factors (for example, political factors, social factors, or others etc) that have caused trend and pattern change in the current wave of post 1978 by comparing it with previous waves; and finally the connection between the social and political environment at the time and each corresponding wave.

Waves of Chinese Students Studying in America Before 1949

The Late Qing Period: 1847–1911

After being defeated in the first (1839-1842) and second (1856-1860) Opium Wars,[2] and nearly overthrown by the Taiping Rebellion (1850-1864)[3], the cadreman and the elites both in the government and the intellectual community in China realized the

[2] The Opium Wars, also known as the Anglo-Chinese Wars, divided into the First Opium War from 1839 to 1842 and the Second Opium War from 1856 to 1860, were the climax of disputes over trade and diplomatic relations between China under the Qing Dynasty and the British Empire.

[3] The Taiping Rebellion was a widespread civil war in southern China from 1850 to 1864, against the ruling Manchu-led Qing Dynasty.

necessity for this old empire to learn from the Western powers, especially on the modernization of Military and Science. It was under such background, the Qing Government of China (1644-1911) initiated the Self-Strengthening Movement or Westernization Movement (In Chinese: Yang Wu Yun Dong) from 1861 to 1895. Advised and assisted by Rong Hong [4], the Qing Government sent altogether 120 young students (the students aged between 10 to 16) to study in America from 1872 to 1875 in 4 batches.[5]

This government-sponsored program did not go through well at the beginning. At that time, most of the Chinese parents had very limited knowledge about Western cultures, and comparatively they were more appealed to the traditional Chinese culture. Therefore, very few of the parents were willing to allow their children to join the program, despite that all of the expenses were covered by the government. In that case, the 120 students were recruited mostly from the areas and regions that had been, to some extent, influenced by the western cultures. Based on the students' native places, 84 students were from Guangdong (Canton), accounting 69.7%, 21 students were from Jiangsu, accounting 17.4%, 8 students were from Zhejiang, accounting 6.6%, 4 students were from Anhui, accounting 3.3%, 2 were from Fujian (1.9%), and 1 was from Shandong (0.8%).[6]

These young Chinese students, during their staying in the U.S., were not only supported to study the Western knowledge, but also strictly required to maintain the

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[4] The first Chinese student studying in the U.S. in 1850s. Also could be translated as Yong Hong, or Yung Wing.

[5] Li Xisuo and Liu Jilin, *Jin Dai Zhong Guo De Liu Mei Jiao Yu* (Tianjin: Tianjin Gu Ji Chu Ban She, 2000), 1.

[6] Ibid, 13.

studying of traditional Chinese Confucianism. After all, the Qing Government just encouraged the students to learn from the United States the knowhow to strengthen the country in Military, Business, and Science, not permitted them to westernize themselves in ideology by indulging in American cultures. The principle of this first government-supported studying aboard program was that Chinese learning as an essence, and the Western learning for uses. At that time, there was a deep-rooted opinion among many powerful government officials and elite intellectuals in China that the traditional Chinese culture was far better than Western cultures while the Western powers were only stronger in weapons.

However, these students westernized themselves very quickly, as they were organized to live with American families. Many became fascinated with Western cultures and religions, and some of them even cut off their braid[7] and joined the Christian. Many students also replaced their traditional Chinese clothing with Western clothing, and neglected the studying of Confucianism. These westernized behaviors of students faced many criticisms and challenges from China. There was reported a critical event that might indirectly lead to the eventual calling back of the students from the U.S. In 1879, when the new program supervisor sent by the Qing Government to meet the students in Washington, none of the students performed prostration ceremony[8]; many influential government officials and intellectuals strongly criticized students, and charged them to have forgotten their own origin. They also warned government that if the program was not called off, all of the students would finally turn into western people, thus, could not

[7] Traditional hairstyle for male required by Qing Government of China.

[8] A traditional etiquette when a subordinate meet the superior required by Qing Government.

be used to strengthen the weak empire.

Another factor that might also cause the early termination of this program was the poor financial situation suffered by the Qing Government. Since the defeat in the opium wars starting from the 1840s, the Qing Government had been forced to sign the unequal treaties to stop the war, and pay large sums of silver as reparations to the Western powers. The government thence carried on the heavy financial burden, as almost entire central governmental revenue in each year had to be used to pay such reparations. For this reason, the government had very limited budget to fund this program from the beginning. In 1874, when the third batch of students was sent to the U.S., many government officials expressed their dissatisfaction to the growing expenses of the students in America. In 1877, with the inflation of price in the U.S., such dissatisfaction became further stronger.

In 1881, because of the ever-growing conservative opposition against the students' rapid westernization and the insufficient fund form the government, the Qing court had to abolish this program that had been originally planned to last for 15 years, and recalled all students back to China. Among the students, more than 10 did not return, and another 5 went back to the United States after returning to China.[9]

Although most of the returned students had only high school education, the majority found employment in China. They contributed mainly in the Foreign Affairs, and also worked in the sectors of Navy, Diplomacy, and Technology. Some of the returned students from this group later became the high achievers in China. For example, Tang Shaoyi (1862-1938), who was sent by the Qing government in the third batch,

[9] Zhang Yufa, "Returned Chinese Students from America and the Chinese Leadership, 1846-1949," *Chinese Studies in History*, 35.3 (March, 2002), 56.

attended the Columbia University, and became the first Prime Minister in the Republic of China in 1912.

Zhan Tianyou (1861-1919), who was sent by the Qing government in the first batch, graduated from Yale University. After returning to China, he served as construction engineer for many railroads, and became a household name for presiding over the construction of China's first self-built railway, the Jing -Zhang Railroad in 1907.

From 1881 to 1900, the Qing government sent no students to study in America.[10] However, beginning from 1900, the governments of various level (the central, provincial) and other organizations resumed selecting students to study in America. The Qing government held three screening examinations in 1909, 1910, and 1911, to select students and sent them to America, which followed the United States policy to return the Boxer Indemnity[11] to China. According to the data, in 1909, 47 students had been selected, in 1910, 70 students, and in 1911, 63 students.[12] In 1911, the Tsinghua School was found with the Boxer Indemnity Scholarship Program, and it functioned as the preparatory school for students who were to be sent to America. However, in the same year, the Qing Government was overthrown by 1911 Revolution (in Chinese: Xin Hai Ge Ming), and the Chinese society was about to enter a new era of Early Republican.

From 1900 to 1911, it was estimated that more than 400 students (not including

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[10] Ibid, 57.

[11] A provision in the Boxer Protocol signed in 1901, which forced Qing government to pay reparations to foreign powers for the losses in the Boxer Rebellion of 1900.

[12] Chen Xuexun and Tian Zhengping, *Zhongguo Jin Dai Jiao Yu Shi Zi Liao Hui Bian: Liu Xue Jiao Yu* (Shanghai: Shanghai Jiao Yu Chu Ban She, 1991), 188-190, 197-199, 200-201.

the self-supported students) were sent to study in America.[13] Many of them were able to achieve a higher academic outcome compared with the 120 students sent by the Qing Government, as many of them obtained a college degree (in 1911, there were 323 Chinese students obtained college degree in America)[14], and some even obtained Master and PhD Degrees.

The students selected wide range of subjects to study, some even majored in Chinese Studies. However, in the government-sponsored program with Boxer Indemnity, more students studied the subjects in Natural Science. Using the year of 1909 and 1910 as examples, in 1909, of the 47 students sent to America, 39 selected majors in Science, Technology, Mining, and Agriculture, with only 8 studying Education, Literature, Psychology, and Economy. In 1910, of the 70 students sent to America, only 8 studied Humanities, and others all selected Engineering, Physics, Chemistry, Medicine, Agriculture, and other Science majors. According to the rough estimation from Tsinghua School on the Boxer Indemnity Scholarship Program, 62.7% students selected majors in Science and Technology, Business, Agriculture, and Medicine (of which 31.3% studied Engineering, 9% studied Science, 11% studied Business, and 10.5% studied Medicine and Agriculture), 7.2% selected Literature and Philosophy, 24.5% studied subjects related to Politics, Economics, Laws, Education, and Journalism etc.[15]

This disproportional inclination to the Science and Technology might because that on one hand, the Tsinghua school designated that 80% of the students selected must study

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[13] Zhang, 2002, "Returned Chinese Students from America and the Chinese Leadership, 1846-1949", 58.

[14] Wu Ni, *Zhongguo Ren Liu Xue Shi Hua* (Beijing: Shang Wu Yin Shu Guan, 1997), 66.

[15] Ibid, 59-60.

Science and Technology, and, on the other, many students sent to study in America were very impressed and influenced by the pragmatism widely practiced in the U.S. educational system. Many of them believed that the successful experience of America as a young country depended on continuously advancing the Technology and Engineering to the topmost level, thus was capable of discovering the rich natural resources buried in the country. In addition, according to the political situation at that time, the Qing Government was on the verge of collapse, and a new Republican Government was about to be found. Therefore, many students studying in America have a common and popular thought that the development of a new country depends on the development of the Industry and Commerce, thus introducing the Technology and Science was critical to the founding of a new Republic. It might because of that, the students studying Science, Technology, and Engineering accounted a significant proportion in the whole population of Chinese students studying in America.

During that period, the Chinese students studying in America had a high desire to return after graduation, because they tended to regard their education in the U.S. as a platform to fulfill the purpose of retuning and contributing to the national economic construction in China. As a student, who was sent by Tsinghua School, recalled: "generally, Chinese students studying in America all wanted to learn something, and prepared to return to serve for China. There were very few (I cannot say none) prepare to stay in America after graduation. Therefore, at that time, Chinese students in America all had a purpose, which was to learn some new knowledge, and return to make contribution to the society and country." [16]

[16] Ibid, 61.

The returned students worked in various professions (such as Diplomacy, Finance and Economy, Justice, and etc.), and made great contributions to China, as she was transforming from an old feudal empire to a new modern republican country. Many became the high achievers. For example, Kong Xiangxi (1880-1967), who went to America in 1903 and received bachelor from Oberlin College and Master from Yale University, became the Minister of Finance for the Nationalist Government in 1926. Wang Chonghui (1881-1958), who went to America in 1902 and earned a PhD from Yale University, became the Minister of Justice in 1912 and 1928. He was regarded as one of the founders of Chinese modern law.

The Early Republican Period: 1912 – 1928

In 1911, the Qing Government was destroyed by the Republic Revolution, and the rein of China was actually controlled by the Beiyang Government (also called Beijing Government 1912-1928) led by the warlord Yuan Shikai. However, the Tsinghua School and the Boxer Indemnity Scholarship Program remained.

Although there was a power transformation of government in 1912, the Tsinghua School continuously sent students to America. According to the data, from 1909 to 1925, the total number of students sent by Tsinghua School was 1,031.[17] Moreover, the numbers of self-supported students also increased; in 1921, 74 self-supported students went to America, in 1922, 77, in 1923, 82, in 1924, 130; and in 1924, there were 1,075 self-supported Chinese students studying in America.[18]

The subjects selected by Chinese students in America during this period were

[17] Zhang, 2002, 61.

[18] Ibid, 62.

diversified, of which Engineering was still the most popular subject studied by Chinese students. Using the data of the students sent by Tsinghua School from 1909 to 1926 as an example, 32.33% studied Engineering, 23.84% studied Social Science, 11.25% studied Business, 10.99% studied Natural Science, 10.38% studied Economics, 9.15% studied Political Science, 5.54% studied Humanities, 5.19% studied Medicine, 5.04% studied Education, 3.63% studied Agriculture, 2.77% studied Law, 1.94 studied Military Affairs, 1.54% studied Sociology, 0.25% studied Music.[19]

The returned students from America during this period made great contribution to the modern transformation of the Chinese society. For example, Mao Yisheng (1896-1989), who was sent by Tsinghua School in 1916, obtained Master's degree in Bridge Engineering from Cornell University in 1917, and PhD from Carnegie Mellon University in 1919 (he was the first doctorate graduate in the University, and the CMU, On April 18, 2006, set up a statue honoring his achievement[20]). He returned to China in 1920, and presided over the design and construction of the Qian Tang Jiang Bridge from 1934 to 1937. It was the first modern steel bridge designed and constructed by Chinese. In 1937, in order to prevent the Japanese invading forces attacking the city of Hangzhou, he personally involved in the destruction of the bridge, and in 1948, he was authorized to lead the repair work of the bridge. In 1955, he was selected as the Academician of Chinese Academy of Science. In 1982, he became the foreign Academician of National Academy of Engineering (United States).

Hu Shi (1891-1962), who was sent by Tsinghua School in 1910, first studied

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[19] Ibid, 63.

[20] See Wikipedia about Mao Yisheng.

Agriculture in Cornell University, and later obtained the PhD in Philosophy from Columbia University. When he was in Columbia University, he was learning from John Dewey (1859-1952). Influenced by Dewey, he followed firmly in the mind of Experimentalism (Pragmatism) in his life. After returning to China, he joined the La Jeunesse or New Youth (In Chinese: Xin Qingnian),[21] and used it as a platform to disseminate the ideas of Democracy and Science. He also made important contribution to the study of History, Philosophy, Ethics, Literature, Education, Textology, and Redology[22] in China. In 1938, he became the Chinese Ambassador to the United States. In 1939, he was nominated Nobel Prize in Literature. In 1946, he became the President of Peking University (Beijing University). He was regarded as one of the leaders in New Culture Movement (In Chinese, Xin Wenhua Yundong)[23].

Lin Yutang (1895-1976) went to America in 1919, and received a Master's degree in Comparative Literature from Harvard University in 1921 (He obtained doctorate from University of Leipzig in Germany in 1923). He returned to China in 1923, and became a professor and the dean of English Department in Beijing University. He wrote both in Chinese and English, and his works in both languages all enjoyed a high prestige. He was nominated Nobel Prize in Literature in 1940 and 1950. His English works such as " My Country and My People" (1935) and " The Importance of Living" (1937) all became the top sales books once published in the United States, playing an important role in introducing the classical Chinese culture to the Americans. He was also an inventor. In

[21] New Youth was an influential Chinese magazine in the 1910s and 1920s that played an important role in initiating the New Culture Movement and spreading the influence of the Movement.

[22] Redology is the academic study of Cao Xueqin's Dream of the Red Chamber, one of the Four Greatest Classical Novels of China.

[23] New Culture Movement was a literature revolution launched in 1919 to revolt against the Confucianism.

1946, he applied a pattern for inventing the Chinese typewriter in the United States.

Zhu Kezhen (1890-1974) went to America in 1910. He graduated from the College of Agriculture in University of Illinois in 1913. In 1918, he obtained the Doctorate degree in Meteorology from Harvard University. After returning to China, he taught in Nanjing University from 1920 to 1929, during which he prepared to establish the meteorological observation. This was regarded as the starting point and mark of establishing and founding the modern meteorological industry in China. From 1929 to 1936, he acted as the director in the Institute of Meteorology of Academia Sinica (Central Research Academy). He served as the president of Zhejiang University from 1936 to 1949. In 1955, he was selected as the Academician in Chinese Academy of Science.

The Nationalist Government Period: 1928 – 1949

Another significant wave was in the Nationalist Government period from 1928 to 1949. In this period, the political and social environment in China was extremely unstable due to the Japanese invasion (1931-1945) and the civil war between Nationalist Government and Communist Party (1927-1937, 1946-1949). Although the amount of Chinese students studying in the Unites States in this period experienced ups and downs, many American-educated Chinese students during this critical period still brought a significant impact on China's modernization on Technology, Science, Military Affairs, Military Industries, and etc. Such influence could also be seen in various aspects of the Chinese society at the present time.

In 1928, the Nationalist Government was established with the success of Northern Expedition.[24] The new government continued the policy of Beiyang Government to send

[24] The Northern Expedition was a military campaign led by the Kuomintang (KMT) from 1926 to 1928. Its

Chinese students to study abroad. In 1928, the Tsinghua School became the Tsinghua University (Qinghua University), and continued to select students to study in America. However its role seemed weakened by the increase of self-supported students and other government-supported programs. For example, according to the statistics released in 1928, there were approximate 2,500 Chinese students studying in America, and around 400 were sent by Tsinghua School annually;[25] however, in 1932, only 25 students were selected by Tsinghua School. In 1934, only 15 students were selected.[26]

From 1929 to 1937, 1,834 students were sent by the government to study in America, but, this number was greatly reduced after the outbreak of the Sino-Japanese War (1937-1945). From 1939 to 1941, only 193 students went to study in America, and many Chinese students even returned to China from America to join the war against Japanese invasion. According to the record in May 1939, the number of Chinese students studying in America was 1163, reducing around one-third compared with the situation before the war;[27] however, after the victory of the Second World War in 1945, this number was rapidly recovered. For instance, in 1945, only 2 students were sent by the government, but in 1946, 554 students went to America.[28] The number continued to increase even during the second civil war between Nationalist Government and Communist Party from 1946 to 1949. In 1948, there were 2,710 Chinese students

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main objective was to unify China under the Kuomintang banner by ending the rule of local warlords. It led to the demise of the Beiyang government and to the Chinese reunification of 1928.

[25] Lin Zixun. *Zhong Guo Liu Xue Jiao Yu Shi, 1847-1975* (Tai Bei Shi: Hua Gang, 1976), 455.

[26] Zhang, 2002, 74.

[27] Wang Qisheng, *Zhongguo Liu Xue Sheng De Li Shi Gui Ji, 1872-1949* (Changsha: Hubei Jiao Yu Chu Ban She, 1992), 29.

[28] Ibid, 31.

studying in America, and this number increased 40% in 1949, as there were recorded more than 3797 students studying in U.S. universities and colleges.[29]

The subjects studied by Chinese students during this period were comprehensive. Using the data of 1936-1937 (before Sino-Japanese War) and 1945 (after the victory) as the example, between 1936 and 1937, of the 2,162 students studying in America, 22.4% studied Engineering, 17.8% studied Education, 13.8% studied Social Science, 12.4% studied Humanities, 11.1% studied Medicine, 10.4% studied Natural Science, 8.6% studied Business, 3.4% studied Agriculture, and 0.1% studied Military Affairs. In 1945, there were 3,022 students studying in America, of which 41.1% studied Engineering, 15.9% studied Social Science, 10.9% studied Natural Science, 7.6% studied Medicine, 7.2% studied Education, 7.0% studied Humanities, 6.9% studied Business, 2.4% studied Agriculture, and 1.0% studied Military Affairs.[30]

In this period, more Chinese students studying in America were able to achieve an advanced academic degree. For example, between 1931 and 1936, 396 Chinese students obtained Master's degree, and 223 students obtained PhDs.[31]

The returned students worked in various professions, and a high percentage of them employed in the sectors of Education and Government. Based on the record, in 1934, of the 2,777 returned students from America, 32.88% employed in Education, and 42% found employment in Government. In 1937, of the 1,152 returned students, 28.13%

[29] Ibid, 32.

[30] Zhang, 2002, 75.

[31] Ibid, 75.

employed in Education, and 29.34% found employment in Government.[32]

Although a significant amount of Chinese students decided to stay in America after the founding of the People's Republic of China in 1949, some prominent returned students became the backbone in the sector of Science and Technology. For example, Qian Xuesen (1911-2009, commonly known in the U.S. as Hsue-Shen Tsien or H.S. Tsien), who was sent by Tsinghua University in 1935 to study Aerodynamics in America, obtained Master's degree from Massachusetts Institute of Technology in 1936, and PhD from California Institute of Technology in 1939 (Became the student of Theodore von Kármán). He returned to China in 1955,[33] and was authorized to establish the first rocket and missile research facility in China - the Fifth Research Institute affiliated to the Ministry of Defense (It became the China Aerospace Science and Technology Corporation in 1999). It was because of his contribution to the construction of China's Dongfeng Ballistic Missiles and Long March Space Rocket, he was regarded as the "Father of China's Missile Program". In 1958, he participated in the establishment of the University of Science and Technology of China.

Deng Jiaxian (1924-1986), who went to America in 1948, obtained PhD in Physics from Purdue University in 1950. He returned to China in 1950, and became the leading organizer and key contributor to the Chinese nuclear weapon programs. His contribution earned him the title "Hero of Two Bombs" in China.

Summary

Refer to table 1 about the numbers of students from China to study in America

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[32] Ibid, 76.

[33] As the exchange of releasing the U.S. pilots who became the war prisoners in the Korean War (1950-1953). See Wikipedia about Qian Xuesen.

from 1850 to 1949.[34]

Table 1. Numbers of Chinese Students Studying in America from 1850 to 1949

Year	Student Number	Year	Student Number
1850	1	1874	2
1875	1	1876	1
1878	5	1879	13
1880	12	1881	4
1883	2	1885	1
1886	1	1892	2
1895	1	1897	4
1898	3	1899	1
1900	3	1901	14
1902	8	1903	5
1904	21	1905	25
1906	60	1907	71
1908	77	1909	69
1910	107	1911	90
1912	79	1913	138
1914	190	1915	213
1916	181	1917	173
1918	229	1919	261
1920	395	1921	387
1922	403	1923	426
1924	383	1925	349
1926	341	1927	302
1928	306	1929	340
1930	316	1931	227
1932	158	1933	104
1934	172	1935	212
1936	230	1937	219
1938	235	1939	158
1940	206	1941	220
1942	150	1943	218
1944	270	1945	543
1946	648	1947	1,194
1948	1,274	1949	1,016

This table does not contain the 120 students sent by Qing government from 1872 to 1875.

[34] Wang, 1992, *Zhongguo Liu Xue Sheng De Li Shi Gui Ji, 1872-1949*, 45.

The Current Wave in the Reform and Opening up Period: Post 1978

In 1949, the Nationalist Government lost the civil war, and had to move to Taiwan. The China was therefore separated to two parts, with the Mainland controlled by Communist Party, and Taiwan (Republic of China) controlled by Nationalist Government. After the founding of the People's Republic of China controlled by the Communist Government in the Mainland, the U.S. Government cut relationships of any type with the Mainland. In this case, from 1950 until 1974/1975, China (Mainland) sent no students to America.[35] However, in the island of Taiwan, students were continually sent to study in America. In 1950, there were 3,637 students from Taiwan studying in America, in 1960, 4,564, in 1970, 12,029, in 1980, 17,560, and this number reached historical height to 37,580 in 1994 (Taiwan figure provided here only for reference).[36]

In 1971, Mainland China joined United Nation, and the People's Republic of China (P.R.C) became the sole legal representative of China in the international community. In 1978, the Communist Government began the economic reform by launching the "Reform and Opening up" project.[37] This ended almost 30 years of Mainland China's isolation from the international community since 1949. In 1979, after the establishment of diplomatic relation between China and the United States, students from Mainland China began to study in America.

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[35] Institute of International Education, *Open Doors: Report on International Educational Exchange, 1948-2004* (New York, N.Y.: Institute of International Education, 2005).

[36] Bureau of International Cultural and Educational Relations R.O.C, " Tai Wan Xue Sheng Liu Mei Tong Ji Tu, 1950-2007", http://www.edu.tw/BICER/content.aspx?site_content_sn=6235

[37] Refers to the program of economic reforms called "Socialism with Chinese characteristics" in the People's Republic of China (PRC) that were started in December 1978 by reformists within the Communist Party of China (CPC) led by Deng Xiaoping.

The Soar of the Chinese Student Population in America

During the first two years after 1978, students from China were carefully selected by the government and other organizations to study in America. The population of the Chinese students studying in America was small compared with the ones from other East Asian countries and regions. In 1978/1979, among top student senders to America, 15,460 students were from Taiwan, 10,520 were from Hong Kong, 10,490 were from Japan, and 4,980 were from Republic of Korean. In 1978/1979, among top student senders to America, 17,560 students were from Taiwan, 12,260 were from Japan, 9,900 were from Hong Kong, and 4,890 were from Republic of Korean; however, during these two years, the numbers of students from China in America were all counted less than 1,000.[38]

With the strengthened efforts from the Communist Government to reform the country's economy in the early 1980s, more students in China were encouraged to study in America. In 1980/1981, 2,770 Chinese students went to study in America,[39] and it was the first time that students from China studying in America were reported over 1,000. With the significant increase of the self-supported students in the 1980s, the numbers of Chinese students studying in America began to change dramatically. In 1988/1989, China displaced Taiwan as the leading sender of international students to the U.S., remaining the leading place of origin until it was displaced by Japan in 1994/95. In 1998/99, China became the leading sender again for three years, through 2000/01. In 2001/02, India became the top sender of students to the U.S, and retained that position for eight years,

[38] Institute of International Education, 2005.

[39] Ibid.

through 2008/09. In 2009/10, China again became the top sending country, and retained that place for the third year in a row in 2011/12.[40]

See table 2[41] about the numbers of students from China to study in America from 1980 to 2012.

Table 2. Numbers of Chinese Students Studying in America from 1980 to 2012

Year	Student Number	Year	Student Number
1980/1981	2,770	1981/1982	4,350
1982/1983	6,230	1983/1984	8,140
1984/1985	10,100	1985/1986	13,980
1986/1987	20,030	1987/1988	25,170
1988/1989	29,040	1989/1990	33,390
1990/1991	39,600	1991/1992	42,940
1992/1993	45,126	1993/1994	44,381
1994/1995	39,403	1995/1996	39,613
1996/1997	42,503	1997/1998	46,958
1998/1999	51,001	1999/2000	54,466
2000/2001	59,939	2001/2002	63,211
2002/2003	64,757	2003/2004	61,765
2004/2005	62,523	2005/2006	62,582
2006/2007	67,723	2007/2008	81,127
2008/2009	98,235	2009/2010	127,628
2010/2011	157,558	2011/2012	194,029

According to table 2, starting from 1980, the numbers of Chinese students studying in America went through a stable increase, with only occasional decrease in

[40] Institute of International Education (IIE), " Fact Sheets by Country: China, 1995/96-2011/12," Open Doors Report 2012, http://www.iie.org/Research-and-Publications/Open-Doors/Data/Fact-Sheets-by-Country/2012

[41] Ibid; Data from 1980/81 to 1994/95 were collected from Institute of International Education, 2005.

1993/1994, 1994/1995, and 2003/2004. This pattern reflected a corresponding trend to China's economic growth. From 1978 until present, China's economy remained one of the fastest developing rates in the world. From 1978 to 2012, the average GDP (Gross Domestic Product) growth rates of China were above 8% annually.[42] In 2011, China became the second largest economy in the world. Therefore, Chinese Government always encouraged students, both self-supported and government-supported, to study aboard, thus to take advantage of the brain gain to give continuous impetus to the country's economic growth.

It worth pointing out that from 2007/2008 to 2011/2012, the numbers of students from China to study in America soared. In 2007/2008, 81,127 Chinese students went to study in America, increased 19.8%. In 2008/2009, 98.235 Chinese students went to study in America, increased 21.1%. In 2009/2010, 127,628 Chinese students went to study in America, increased 29.9%. In 2010/2011, 157,558 Chinese students went to study in America, increased 23.5%. In 2011/2012, 194,029 Chinese students went to study in America, increased 23.1%.[43]

The factors that gave rise to such dramatic increase might be generalized from the following sectors.

In the sector of economy, other than the fast GDP growth above stated, the GNI (Gross National Income) growth of China was also significant. According to the statistics from World Bank, in 1980, the GNI of China was only 250$ Per Capita; however, from

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[42] World Bank, "Data by Country: China, 1978-2012", http://data.worldbank.org/country/china

[43] Institute of International Education (IIE), " Fact Sheets by Country: China, 2007/08-2011/12," Open Doors Report 2012, http://www.iie.org/Research-and-Publications/Open-Doors/Data/Fact-Sheets-by-Country/2012

2008 to 2011, the GNI of China was respectively 6,230$ Per Capita (2008), 6,820$ Per Capita (2009), 7,530$ Per Capita (2010), and 8,450$ Per Capita (2011).[44] The growth was relatively manifest. Another economic factor was a stronger currency. Starting from 2005, the Chinese currency – Yuan (RMB) was continuing the appreciation. On July 1st 2005, the exchange rate between CNY and USD was around 100:12, however, on November 5th 2010, that rate was around 100:15, representing a growth of 24.25%.[45] With the consecutive fast economic growth and a stronger currency, more Chinese families have noticed that the expenses of studying in America became more affordable than ever.

In the sector of education, the growing unsatisfactory attitude in the Chinese society to question the effectiveness of the Chinese University Entrance Examination (in Chinese: Gao Kao) to promote the social mobility has led to a continuous decrease on the Gao Kao participants all over the country. The Gao Kao participants were 10,500,000 in 2008, 10,200,000 in 2009, 9,570,000 in 2010, 9,330,000 in 2011, and 9,150,000 in 2012.[46] For many Chinese high school graduates, if they could not achieve a high grade in the Gao Kao, their chances to attend a top university such as Beijing University, Tsinghua University, or other universities of the similar level would be dimed. In that case, it may be difficult for them to compete for a prospective job after graduating from college. Therefore, within the recent years, many Chinese parents took the alternative to send their children to receive the college education abroad, especially in America.

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[44] World Bank, "Data by Country: China, 1978-2012", http://data.worldbank.org/country/china

[45] State Administration of Foreign Exchange (China), http://www.safe.gov.cn/

[46] Ministry of Education China, "Quan Guo Li Nian Can Jia Gao Kao Ren Shu He Lu Qu Ren Shu Tong Ji, 1977-2012", cited in Ren Min Wang, http://edu.people.com.cn/n/2013/0503/c116076-21359059.html

Therefore, while the majority of Chinese students study at the graduate level, the U.S. continues to experience an upsurge in the number of undergraduate students coming from China. From 2010 to 2012, the percentage of undergraduates among Chinese students studying in America was respectively 31.3% (2010), 36.2% (2011), and 38.4% (2012).[47]

Other factors like high unemployment rates among college graduates in China and the increasing visa-approval rates in the U.S. embassy and consulates in China might also contributed to the soar of the numbers of Chinese students studying in America within the recent years.

The Inclination to STEM Subjects

In the current wave of Chinese students studying in America started from 1978, many students selected majors within the fields of Science, Technology, Engineering, and Mathematics (STEM). This might because, on one hand, China was experiencing a fast economic growth, and the Communist Government was in higher demand of students studying the subjects of Science and Technology that could contribute more directly to the country's modernization construction in economy compared with the students studying the subjects of Liberal Arts; on the other hand, the institutes and organizations in the U.S. were actively recruiting the foreign talents in the fields of Science and Technology to contribute to the United Sates.

Using the data from Oak Ridge Institute for Science and Education as an example, of the 16,391 foreign doctorate recipients in Science and Engineering (S/E) from U.S. universities in 1992/1993, there were 4,010 students from China; of the 7,850 foreign

[47] Institute of International Education (IIE), " Fact Sheets by Country: China, 2009/10-2011/12," Open Doors Report 2012, http://www.iie.org/Research-and-Publications/Open-Doors/Data/Fact-Sheets-by-Country/2012

doctorate recipients in Science and Engineering (S/E) from U.S. universities in 2002, 2,139 students were from China.[48]

According to a survey, during the closing decades of the 20th century, roughly 80% of the Chinese and Indians who earned U.S. PhDs in Science, Technology, Engineering, and Mathematics (STEM) fields have stayed in the United States and provided a critical boost to the U.S. economy. [49]

Table 3[50] presents a recent trend of the subjects studied by Chinese students during the soar of Chinese students studying in U.S. universities from 2010 to 2012.

Table 3. Subjects Studied by Chinese Students from 2010 to 2012

Subjects (%)	2009/2010	2010/2011	2011/2012
Business/Management	24.3%	27.5%	28.7%
∗Engineering	20.2%	19.2%	19.6%
∗Physical/ Life Sciences	12.6%	11.5%	9.9%
∗Math/ Computer Science	10.7%	10.6%	11.2%
Social Science	6.7%	7.0%	7.7%
Intensive English	4.9%	4.3%	2.8%
Fine/ Applied Arts	2.8%	3.4%	3.8%
Health Professions	2.1%	2.0%	1.5%
Education	1.9%	2.1%	1.7%
Humanities	1.1%	1.2%	1.3%
Undeclared	2.6%	2.3%	2.2%
∗Other	10.1%	8.9%	9.6%

∗ STEM Subjects

∗ Other includes primarily Agriculture, Communications, Law, General Studies and Multi/interdisciplinary Studies.

[48] Michael G. Finn, *Stay Rates of Foreign Doctorate Recipients from U.S. Universities, 2007* (TN: Oak Ridge Institute for Science and Education, 2010).

[49] Vivek Wadhwa, "A Reverse Brain Drain" *Issues in Science and Technology*, 25.3(January, 2009),45-46.

[50] Institute of International Education (IIE), "International Students: Fields of Study by Place of Origin, 2009/10-2011/12" Open Doors Report 2012, http://www.iie.org/Research-and-Publications/Open-Doors/Data/International-Students/Fields-of-Study-Place-of-Origin

According to table 3, in spite of a significant amount of students studying Business /Management, the STEM subjects were still the top popular areas, which major portion of Chinese students in America constantly studied.

Huge Brain Drain and New Trend to Return in Transnational Identity

While the numbers of Chinese students studying in America increased dramatically after 1978, the numbers of Chinese students who do not return after graduation equally increased dramatically.

When China was speeding up the economic reform and modernization by sending more students to study abroad, she also encountered a common dilemma that is often faced by developing countries – the Brain Drain. "Modernization depends on advanced knowledge gained overseas in fields in which domestic institutions display weakness; yet those individuals who go abroad to gain that knowledge often find economic conditions and opportunities for advancement more favorable in their new environment, and consequently, they decide not to return; this would represent the loss of a vital resource, in which the country has made a large investment in terms of the education such students receive before they seek advanced schooling abroad ."[51]

The brain drain problem among the Chinese students studying in America first became dramatic in the mid-1980s with the increased numbers of self-supported students. It further aggravated after Tiananmen Square Protest of 1989.[52] The consequence of this trend was that China suffered a severe brain drain problem by losing many of its brightest

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[51] Epstein, E.H. and Kuo,W-F, "The Confucian Continuum: Educational Modernization in Taiwan," *Praeger*, (1991): 167-219, 207.

[52] It was a democratic movement initiated by university students in China. See Wikipedia about Tiananmen Square Protest of 1989.

students.

Between 1979 and 1987, approximately 63,000 students and scholars from People Republic of China have come to study in the U.S., with only 20,000 of those who returned.[53] It was estimated in 2003 that since Chinese Government allowed students and scholars to study aboard in the late 1970s, more than 320,000 students have gone overseas to study, nearly half to the United States, and with only less than one third have returned, and most of them who returned were officially sponsored.[54]

According to two separate questionnaire surveys conducted in 1989 and 1990, of the over 1000 Chinese students and scholars studying or working in the U.S. who participated in the survey, only a small minority of students (3%) would like to return to China immediately, 17% of those surveyed would never go back, and 80% would chose to return in 5 to 10 years.[55] From the findings of the survey, the Communist Government's tight political control and the political instability in China were the primary concerns for the surveyed Chinese students.

In another interview survey with 273 Chinese students, scholars, and others residing in the United States conducted in 1993, less than 9% of the interviewees had concrete plans to return, and over 32% were positively disposed to returning in the

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[53] Chou, J, 1989, "A Survey of Chinese Students in the United States, 1979-1987", 1.

[54] Luo, Keren, Fei Guo, and Huang Ping, "China: Government Policies and Emerging Trends of Reversal of the Brain Drain," *Return Migration in the Asia Pacific*, edited by R. R. Iredale, Fei Guo and S. Rozario, (2003): 88-111.

[55] Zhang Xiaoping, 1992, "Residential Preferences: A Brain Drain Study on Chinese Students in the United States", 89.

future.[56] Illustrated from the survey, the economic gap between East and West, the political instability in China in the late 1980s, the continuing concerns about the post-Deng transition, and the desires of talented people for an environment in which they can develop and use their skills have all come together to generate China's brain drain to the United States.

A study on the causes of China's continuous brain drain problem since the late 1980s[57] indicated that on one hand, poor working conditions for both natural and social scientists, inadequate facilities, lack of research founding, low income, limited career opportunities, a low standard of living, strong political control, limited choices of individual's lives, as well as corrupt government officials were generally the major factors that pushed the young Chinese students and professionals to eagerly leave China to study in the U.S. On the other hand, the pull factors from the United Sates such as more individual freedom, higher standard of living, more career opportunities, high income, the new trend of workforce diversity, the fast pace in Science and Technology development, the active recruitment for a large number of highly-trained personnel, and academic rewards to first-rate professionals were also worth noting to attract young Chinese students and professional to stay in America.

The surveys mentioned above may indicate that the China's severe brain drain to the United States started from the 1980s lies in many factors including the political factor, the economic factor, the career development factor, the social environment factor,

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[56] Zweig, D., Chen, C., & Rosen, S, "China's Brain Drain to the United States: Views of Overseas Chinese Students and Scholars in the 1990s," *Institute of East Asian Studies, University of California, Berkeley, Center for Chinese Studies*, (1995).

[57] Qin, W, 1999, "China's Brain Drain: A Study of the Factors Affecting Chinese Students' and Scholars' Decisions to Remain in the United States and Not to Return to China".

and others. And it might because of these, China lost many top students and scholars.

See table 4[58] about percentage of Chinese students on temporary visas receiving Science/Engineering Doctorates who were in the United States 4 to 5 years after graduation for selected year, 1992-2007.

Table 4. Chinese S/E Doctorates Who Were in the United States 4 to 5 Years after Graduation for Selected Year, 1992-2007

1987/88 Doctorate Recipients in 1992	1990/91 Doctorate Recipients in 1995	1992/93 Doctorate Recipients in 1997	1994/95 Doctorate Recipients in 1999
65%	88%	92%	91%
1996 Doctorate Recipients in 2001	1998 Doctorate Recipients in 2003	2000 Doctorate Recipients in 2005	2002 Doctorate Recipients in 2007
96 %	90 %	92%	92%

Indicated from table 4, the stay rates of top Chinese students and scholars in the U.S. after graduation were continuingly increasing, which presented a vital resources loss of China.

In order to counteract the serious brain drain problem of the country, from mid-1990s, the Communist Government in China began to implement a series of favorable policies to attract overseas-educated Chinese students to return. Therefore, the return rates of Chinese students have increased since late-1990s with the steady economic reform and social development in China. The return rates increased 13% annually after 1995.[59]

Table 5[60] presents the numbers of returned overseas-educated Chinese students

[58] Finn, 2010, *Stay Rates of Foreign Doctorate Recipients from U.S. Universities, 2007*.

[59] Liu, 2009, "Mobility, Community and Identity: Chinese Student/Professional Migration to the United States since 1978 and Transnational Citizenship".

from 1978 to 2009.

Table 5. Numbers of Returned Overseas-Educated Chinese Students from 1978 to 2009

Year	Number of Students Studying Aboard	Number of Returned Students
1978	860	248
1980	2,124	162
1985	4,888	1,424
1986	4,676	1,388
1987	4,703	1,605
1988	3,786	3,000
1989	3,329	1,753
1990	2,950	1,593
1991	2,900	2,069
1992	6,540	3,611
1993	10,742	5,128
1994	19,071	4,230
1995	20,381	5,750
1996	20,905	6,570
1997	22,410	7,130
1998	17,622	7,379
1999	23,749	7,748
2000	38,989	9,121
2001	83,973	12,243
2002	125,179	17,945
2003	117,307	20,152
2004	114,682	24,726
2005	118,515	34,987
2006	134,000	42,000
2007	144,000	44,000
2008	179,800	69,300
2009	229,300	108,300
Sum	1,457,381	443,562

With the recent economic recession in the U.S. and the continuous expansion of Chinese market, the return rates of Chinese students from America have also increased.

[60] National Bureau of Statistics of China, *Zhongguo Tongji Nianjian*, (Beijing: Zhong Guo Tong Ji Chu Ban She, 2010).

Based on a survey on international students who graduated in the U.S. in 2008, only 10% of Chinese students revealed a strong desire to stay permanently, and many returned America-trained Chinese were performing the most sophisticated R&D projects in China. In addition, according to the interviews with the executives and human resources managers in China, the number of resumes they received from the U.S. has increased as much as 10-fold during the past few years.[61]

Although the return rates of overseas-educated Chinese students were on an increase streak in the past few years, a new phenomenon of the returnees in a transnational identity was worth noticed. It has been reported by many news medias in China that many returned Chinese students from overseas have turned immigrants (including obtained either the foreign citizenship or the permanent residency of a foreign country). These returnees came back without settling down in China, and they travel between China and the country of their immigration. Therefore, a new term has been generated in China to define such group of people as "Seagull" (In Chinese: Hai Ou).

According to a survey conducted in 2000 by China Ministry of Education, of 551 overseas-educated Chinese students who have set up enterprises in 13 industrial parks, only 44% resided in China on a regular basis.[62]

In another survey did in Silicon Valley with Mainland Chinese academics, many of the Mainland's top researchers and entrepreneurs are currently living in a diaspora option. It is difficult for them to return home completely. The longer they stay abroad, the more difficult for them to return. Family obligations and professional affiliations are not

[61] Wadhwa, 2009, "A Reverse Brain Drain", 49, 51.

[62] Liu, 2009, 214.

easily set aside. Therefore, the diaspora option of building a transnational scientific community becomes one more way Western technology can flow into China and strengthen it through 'Science and Education'. It allows Mainland Chinese overseas to profit from China's growing market. Finally, as China's Science and Technology advances, the benefits of these exchanges to the West will expand as well.[63]

Prominent Representatives of Returned Students during Post 1978 Period

During the huge wave of studying abroad after 1978, although China suffered a severe brain drain problem, the impact brought by the returned overseas-educated Chinese students on many aspects of the modern Chinese society was manifest and positive. These returnees acted as an important bridge between China and world, connecting the modern Chinese society closely with the ever-changing global trend, especially in advanced technologies.

Zhongguancun[64] is a technology hub located in Beijing, and it was also referred as the China's Silicon Valley. Since 1980s, it always attracted many returned overseas-educated Chinese students to start their own enterprises there. Among them, many returned students from America made great contributions to the fast technological development in China.

Zhang Chaoyang (Charles Zhang) attended graduate school in Massachusetts Institute of Technology in 1986 with a full scholarship from Nobel Prize physicist Tsung-Dao Lee (In Chinese: Li Zhengdao). He obtained PhD from MIT in 1993, and returned to

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[63] Zweig, D., Fung, C. S., & Han, D, "Redefining the Brain Drain: China's 'Diaspora Option'," *Science Technology & Society*, 13.1 (May, 2008), 1-33.

[64] Zhong Guancun is an electrical and commercial street located in Beijing. See Wikipedia about Zhongguancun.

China in 1995. He started his own company – the Internet Technologies China (ITC) in 1996 with two MIT professors and with the help of venture capitals. It was the first VC founding of Chinese Internet Company. In the same year, he established the Internet Search Engine – Sohu (Sohu.com), and changed his company's name from ITC to Sohu. Soon, Sohu became a household name in China. In 2000, Sohu was listed on NASDAQ.

Li Yanhong (Robin Li) attended University at Buffalo, the State University of New York (SUNY) in 1991. He received a Master's degree in Computer Science in 1994. He returned to China in 1999, and found the company - Baidu (Baidu.com). Baidu is currently the most popular Internet Search Engine in China, and has become the largest Chinese Internet Search Engine in the world. In 2005, Baidu was list on NASDAQ.

Conclusion

In general, before 1949, many American-educated Chinese students were government-supported, and a significant amount of them returned to China after graduation. As of the subjects, although there was a high percentage of students studying in Engineering, students in the waves before 1949 paid a relatively balanced attention to the wide range of subjects such as Political Science, Social Science, Sociology, Education, Economics, Business, Humanities, Law, Music, Military Affairs, Medicine, Agriculture, Natural Science, and etc.

However, in the post 1978 wave, the self–supported students accounted a significant portion in the American-educated Chinese population, and while the numbers of students from China studying in America continued to increase dramatically, the return rate gradually reduced. Regarding to the subjects, a disproportionally high amount of students studied the subjects categorized as STEM (Science, Technology, Engineering,

and Mathematics).

These differentials between the waves before 1949 and the one post 1978 may reflect that the trend and pattern of Chinese students studying in the U.S. has a bearing on the social and political environment in each corresponding period. For example, the students in the waves before 1949 studied a wider range of subjects in the U.S., and revealed a stronger desire to return. This might because that the waves before 1949 were all in the critical period when China was going through the transformation from an old feudal empire to a modern nation. During those periods, the mainstream intellectuals and elites encouraged the younger generation to learn a wide range of subjects from the western countries in order to contribute to the modernization in every aspect of the Chinese society.

In contrast, the students in the post 1978 wave were more inclined to study the subjects within STEM, this might because the Communist Government especially encouraged the students to gain brain from foreign countries on Science and Technology, and came back to make the direct and important contribution to the country's economic reform and modernization. However, many Chinese students, after studying in the U.S., were more appealed to the political environment in the U.S. characterized with more freedom and more democracy. Therefore, many American-educated Chinese tend not to return. This situation first became dramatic in the mid-1980s with the increase of self-supported Chinese students studying in the U.S, and further aggravated after Tiananmen Square Protest of 1989. The consequence of this trend was that China suffered a severe brain drain problem by losing many of its top students.

However, the return rates of American-educated Chinese students have increased

since late-1990s, as Chinese government started to implement a series of new policies to deal with country's brain drain problem. It had even further increased during the global economic recession in the recent years, as China still maintained a relatively fast developing economy, and its domestic market was continuing the expansion. Yet, a new trend of many returnees in a transnational identity should also be noted.

As of the impact brought by the returned American-educated Chinese students, they played important roles to China's transformation in each critical period in the modern Chinese history. Generally, in the Late-Qing Period, the Qing Government sent 120 students to study in America in order to strengthen its rein of China by learning from Western powers, especially in Military and Technology. Although the program was not successful as planed due to the early abolishment and the low academic level of the students, many of the returned students from America in this period, as the key forerunners of receiving the advanced education from a strong western country, played an important role in inspiring more population in this old feudal empire to seriously learn from the West. In the Early-Republican Period, Tsinghua School played a key role in selecting the talented Chinese students, sending them to study in America. Those returned during this period made great contribution to China's transformation to a modern Republican country. These impacts could be seen not only in the aspects of Science and Technology but also in the field of Education through spreading the advanced ideas such as Democracy and Science. In the Nationalist-Government period, although the political environment was extremely unstable due to the Japanese invasion and the Civil War, many prominent returned students later became the backbone in the development of China's modern Science and Technology, such as Qian Xuesen in the field of

Aerodynamics, and Deng Jiaxian in Physics. The impact remained in Chinese Science and Technology through to the present time. In the Reform and Opening up period after 1978, although China suffered a huge brain drain problem, those returned from America still played an important role in connecting the modern Chinese society closely with the rapid technological development in the world. The bloom of China's IT industry in Chinese Silicon Valley could be seen as a representative example.

Although the pattern of current wave of Chinese students' education in the U.S. studied in this thesis favored a high brain drain of Chinese students to the U.S., a disproportional pursuit of the subjects within STEM, and a fast growth in both application and enrollment numbers, it is not static. The pattern may change according to the corresponding social and political environment. For example, based on the latest data released by Council of Graduate Schools, as for the fall 2013, the international application to the U.S. graduate schools increased mere 1%, following a 9% gain in 2012 and an 11% increase in 2011. This reduced growth in overall international application was primary the result of the 5% decline in applications from China.[65] Based on the report from Wall Street Journal, this reduce of Chinese applicants to the U.S. graduate schools might primarily result from the anxieties over the instable founding within the Science faculties as well as the strict immigration policy in the United States. Therefore, the correlation between the pattern change of Chinese students studying in the U.S. and the latest change of social and political environment in both China and the United States should always be given a focus in the future studies of this kind.

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[65] Council of Graduate Schools, "CGS International Survey Report: Applications", 2013, http://www.cgsnet.org/cgs-international-survey-report-applications

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