

Journey of China Education and Research

Education in ancient China was classical in nature and only the elites and rulers were educated in the areas of philosophy, religion, politics and history. With the birth of China, education became the priority of the newly born country to fight poverty. The education system in China has been deriving its strength from German, Japanese, Britain and US education systems. Over last 100 years from Qing dynasty to independence of China in 1949 and opening up of the country in 1979, education remained as the top agenda of the country. Education has positive impact on the national growth and productivity. It has been shown that 1% increase in school enrolment, ultimately increases the GDP growth rate by 2-3%¹. Economic returns of education are manifold, which include increased individual earnings, increased productivity at national level, improved health due to enhanced awareness about various diseases. In this chapter salient features of the Chinese Education and Research systems have been analyzed.

During the period of 1991-2004, positive external returns of education by 10-14% has been reported in China. The increase in education level in urban areas also led to individual growth. Education brought better changes in rural areas to remove the rural urban disparities. The two important factors which impede

1 Sianesi, B.; Reenen, J.V. The returns to education: *Macroeconomics. J. Econ. Surv.* 2003, 17, 157-200.

the objectives of education are its quality and equity. China has been progressively improving these both aspects of education.

In the 1970s reforms, China has three major shift in their priorities, orientation towards modernization, orientation towards the Future, and orientation towards the World. The education system of China has five lessons to learn for developing counties.

- i. *Evidence based participatory policy making for education reforms:* China's main success in the modernized age is owed to its broad based consultation with the stakeholders and steady change model. They adopted the international models after indigenization. For developing new educational policies, China adopted the five step approach, which includes conducting surveys from the stakeholders, drafting the policy, consulting the stakeholders for their feedback, experimenting and implementation of the policy in gradual manner in limited scale and expansion the education reforms at larger national scale.
- ii. *Strengthening the teacher education and provision of professional support:* China strengthened the teachers' trainings institutes at all levels. From pedagogy to teaching and learning, delivery, assessment to feedback. Research based approaches for trainings were adopted. Some of the important steps included, work by coordinating school-based research projects, regular visits to schools, interpreting curriculum standards, analyzing classroom teaching, preparing teaching lessons, developing teaching materials and distilling best practices for extension (e.g. through demonstrations)².
- iii. *Learning from the world:* China's education experts have been closely coordinating with the external world to learn from the innovations and research in education. They have in many cases, benchmarked various education systems of developed countries made strong partnership for internationalization of education.

2 Education in the 21st Century: Five lessons from China- Available at <https://oecdutoday.com/education-in-the-21st-century-five-lessons-from-china/>

- iv. *Experimentation*: The China's approach for gradual transformation has been one of their major strategy for development and reforms. *Crossing the River by Touching Stones*-this approach proved very successful for transformation of the traditional and predominantly conservative society. They gradually absorbed the results of their experiments in the education systems. The traditional schooling system was abandoned and new school system called *Shiyi Experimental School* was adopted.
- v. *Balancing between Diversity and Unity*: Chinese society is having a diverse culture with very strong identities of the subcultures. The decision making process has to understand this fact. For unity at the national level, education system was harmonized with the international good practices of developed countries but to maintain diversity, it was divided into three levels, national, local and schools based curricula. The national curricula make 80% of the total, whereas the local and school based curricula is given 20% share. This has led to mainly a uniform national curriculum with local and school flavors.

China had dramatic changes and reforms in their education during 1976. China inherited a traditional and static education system. By the end of Imperial era, the literacy rate China was hardly 20% with women literacy at 2-10% in various parts of the country. The education system was mostly bureaucratic in these days with no consultation. The western strides in education prompted with the support of Christian missionaries in 1930s. Until the end of the 19th century western learning remained least priority³. In 1985, *The Communist Party of China's Decision on Systematic Reform of Education*, focused on three major aspects i.e. solidified 9 year compulsory education system, an enhanced

3 Susanne Pepper *Radicalism and Education Reforms 20th Century China*-Cambridge University Press

technical and Vocational Education and Trainings (TVET) system, and a more autonomous higher education system.

The education policy is generally viewed from multiple flows such as political Flows, Economic Flows, Cultural Flows and International Flows. Statistics at China reveal positive correlation between the GDP growth rate and fiscal investment with the four indicators of education i.e. promotion from junior to senior class, fiscal expenditure on education. The basic education and compulsory 9-year education has been quite effective in economic development of the country. The solid growth of Chinese economy after 1985, also led to increase in investment in education.

In political sphere, education remained one of the major priorities of the Chinese Governments. In past many decades, investment in education has been viewed as major catalyst for the economic development and top agenda. In 2017, the Government policy on *The Supervisory and Assessment Approaches for Quality and Balanced Development of Compulsory Education in Counties*, focused on quality of education, the training of talents and promotion of Socialist Modernization⁴. From the cultural perspective, Chinese history and culture has been made as part of education with some basic guidelines for curriculum review and development. In modern education, the traditional view of teacher as role model with strong professional and ethical integrity, as well as personal development for effective teaching and learning is considered as important ingredient of education. The important attributes of China education reforms are given as follows:

- i. ***Teacher Education (TE)***: Teacher education always prepare Competent Teachers (CT), who are instrumental in Quality Education (QE) and Students Achievements (SA). The students' attributes when linked with the industry needs creates Quality Labor Force (QLF) required for market which contribute in the Economic Growth (EG) of the country and collectively leads to National Achievements and

4 Li, J., & Li, J. (2019). Educational Policy Development in China in the 21st Century: A Multi-Flows Approach, *Beijing International Review of Education*, 1(1), 196-220

Competitiveness (NAC) in terms of GDP growth rate, per capita income, employment etc. This relation has been expressed as follows:

TE → CT → QE/SA → QLF → MD/EG → NAC

Many reforms were made in teacher education during last two decades, which include *The Opinions on Fully Deepening the Reform and Construction of Teaching Force in the New Era* (2019) and *The Action Plan for the Revitalization of Teacher Education* (2018–2022). Teachers professionalism has been advocated worldwide since 1960s and China has been following these trends.

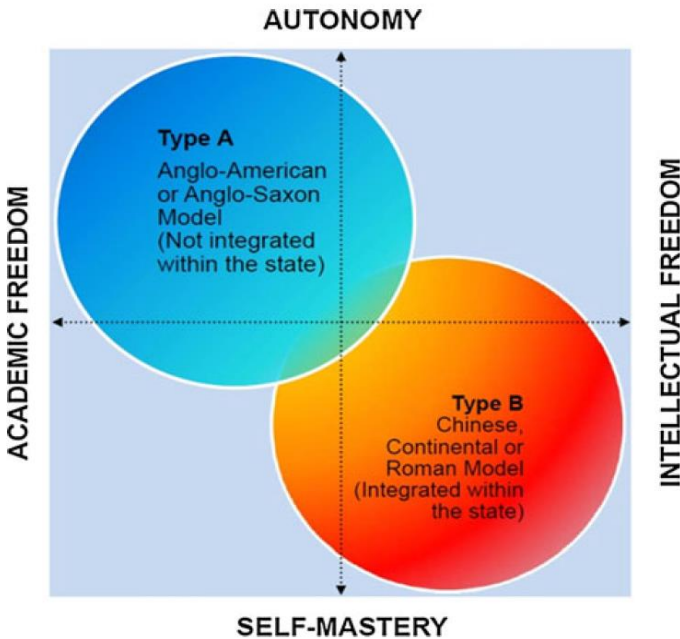
- ii. ***Higher Education Policies:*** At the advent of 21st century, China has intensified their focus on higher education with an aim to create Knowledge Economy. The higher education in China has been linked to quality, equity, efficiency, and service to the nations. This focus is reflected in six major priorities for higher education:
 - a. ***Unprecedented quest for world-class universities (WCUS):*** China has been endeavoring to bring good number of their Universities in top 500 Universities of the world. Today out of world 500 Universities, 38 were Chinese Universities in 2019 as per QS ranking.
 - b. ***Systematic Marketization:*** With the development of University physical, human and financial resource, the University has to be part of the open market to attract good students, faculty and staff. In turn the higher education of China will attract students from all parts of the world.
 - c. ***Revolutionary Massification:*** The China approach to higher education is based on increasing the number of good standard Universities and students in universities, by ensuring quality, affordability and access to higher education to enroll large number of students.

- d. *Structural Optimization*: University is interplay of human and other resources. The sustainability of the higher education institutes is linked to the combination and optimization of the resources through structural reforms in the governance system of University.
- e. *Institutional Digitalization*: The advent of modern technologies has made education more interesting but complex. With 4th Industrial Revolution (I 4.0) already taken up, the use of modern technologies in teaching and learning, research and innovation, students and faculty services etc. has become more important. The significance of such technologies has further increased in the post Pandemic New Normal.
- f. *All-round internationalization*: Internationalization of higher education in the globalized world is inevitable. Chinese Universities have been offering diverse opportunities of joint research collaboration, split and dual degrees, students and faculty exchange, higher education scholarships to overseas students. The initiatives have led to large of international students pursuing their tertiary education at China. From Pakistan alone, more than 30,000 students are continuing their higher education and research pursuits.

The term Chiniversity has been coined by experts for the China model of University. Besides residing on the global ideals to identify the core values of institutional self-mastery and intellectual freedom, the Chiniversity will focus on other strong attributes such as tendency towards ethics-centered exploration of knowledge and normative application, secular and societal missions of higher education, acceptance of the dominant and directive role of government, a vision of teachers and students as scholar officials or officials in waiting, a hierarchical and

meritocratic system, and institutional and disciplinary diversity⁵. The world Universities can be divided into two major types on the basis of two fundamental dimensions: institutional legal status (autonomy vs. self-mastery), and knowledge exploration and applications (academic freedom vs. intellectual freedom).as shown in Fig 52.

The first type of Universities exists in United States and Europe, where fuller status of legal person and academic freedom is protected by law, having no interference from the Government and market. In second type of Universities, the State control is very dominant and direct. Hence Universities are under modern bureaucratic control. This model is more visible in Asia and East Europe, including Pakistan.



University Model A and B (Adopted from Li, J., & Hayhoe, R; 2012)

5 Li, J., & Hayhoe, R. (2012). Confucianism and higher education. In J. A. Banks (Ed.), Encyclopedia of diversity in education (Vol. 1, pp. 443-446). Thousand Oaks, CA: Sage.

In ancient China, the Universities of Taixue or Guozixue existed in 124 BC, under model B. Similarly, the type A University existed as University of Bologna Italy in 11th Century, in its pure form. Over the years, the two types of Universities have overlapped each other under the pressure of marketization, globalization and industrialization. The WCU concept of China is closely characterised by its close connection with Government. These Universities have been taking their influences from Japan Model in 1890's, European Model in 1910s, American Model of 1920s and Soviet Model of 1950s. Hence the Chinese Modern Universities have synthesized, the best practices and model into a new model. Institutional identity is seen for personal freedom in research and choice of curriculum but not to detach themselves from the State.

In Chinese model of University, Chinese scholars and leaders have strong socio-political responsibility and conviction that knowledge must be expressed in social action. They are expected to support major State projects. Hence the Chinese Universities are more close to Type A, struggling for more autonomy and intellectual freedom. The CPC controls over University faculty and students, though Universities now generate large resources from students' tuition fee, research and consultancies. The China Government has been providing generous funding to elite institutions for their active participation in the global community for becoming world class institutes. The problem of large number of enrolment is thus given to other institutions. This approach seems rational, as all of the Universities cannot become global leader rather a successive and incremental approach is adopted in line with the Chinese philosophy. For creating excellence in Engineering, Science and Technology, China protected diversity and nurtured alternative types of institutions in the areas of agriculture and polytechnic Universities.

The China World Class University (WCU) model is faced with many challenges and threats. The large number enrolment in Universities as priority of the Government has affected the quality, as the students' teacher ratio increased sharply. The second major

challenges are academic misconduct reflected in the false qualification, publication, research manipulation, lack of commitment, falsification of facts. This is very common problem in developing countries including Pakistan. With the adoption of highly quantitative metrics for the performance evaluation of faculty and institutions in the new world and China, the real teaching and commitment of teachers has been diverted to research publication, impact increase, registration of patents etc. and as result, quality teaching and research remained the least priority. Another challenge to Chinese Universities is highly bureaucratic systems, where the Government officials are given more priority and authority. Under such conditions, the officers and administrative staff enjoy more political and economic benefits, whereas faculty and students remain disadvantaged.

China has developed their blueprint of creating World Class Universities during 2010-20 and still working on it. As a result, few top Chinese Universities may become candidate for WCUs in near future. It will still take a large time for Chinese Universities to reach at the level of the leading US universities. This will require to strengthen the self-mastery, intellectual freedom and freedom from the Government interference in the University administrative and political matters.

NO	University	THE 2021	QS 2021	ARWU 2020
1	Tsinghua University	20	15	29
2	Peking University	23	23	49
3	Fudan University	70	34	100
4	University of Science and Technology of China	87	93	73
5	Zhejiang University	94	53	58
6	Shanghai Jiao Tong University	100	47	63
7	Nanjing University	111	124	101-150

NO	University	THE 2021	QS 2021	ARWU 2020
8	Southern University of Science and Technology (SUSTech)	251-300	323	301-400
9	Sun Yat-sen University	251-300	263	101-150
10	Beijing Normal University	301-350	279	201-300
11	Huazhong University of Science and Tech	301-350	396	101-150
12	Wuhan University	301-350	246	151-200
13	Central South University	351-400	651-700	101-150
14	East China Normal University	351-400	501-510	401-500
15	Nankai University	351-400	377	201-300
16	Harbin Institute of Technology	401-500	260	101-150
17	Hunan University	401-500	601-650	201-300
18	Shenzhen University	401-500	601-650	201-300
19	South China University of Technology	401-500	462	151-200
20	Tianjin University	401-500	387	151-200

THE: Time Higher Education, ARWR: Shanghai Higher Education Ranking

Sources: Information in this table is based on the latest Times Higher Education *World University Rankings*⁶, *QS World University Rankings*⁷ and *Academic Ranking of World Universities*⁸.

⁶ Time Higher Education Ranking available at <https://www.timeshighereducation.com/content/world-university-rankings>

Research Universities and Higher Education Institutes (HEIs) in China: At the 100th year celebrations of Beijing University, a 211 and 985 project was ushered with an aim to pump investment into the elite Chinese institutions for becoming world Class Universities. The 211 project was envisaged to make 112 Universities spearheading in the national economic developments, whereas the 985 project aimed at transforming the 40 top universities of China into World Class Universities⁹. China scientific publications' share increased from 4.4% in 1999 to 10.2% in 2008 with a total number of 204,000 papers. Chinas has become the top third country in Research and Development (R&D) investment at 2% of GDP. China is second to US in the R&D investment. The top 20 countries in R&D spending are shown below:

Rank	Country	Amount	Rank	Country	Amount
1	United States	\$581.6	11	Canada	29.0
2	China	554.3	12	Spain	23.6
3	Japan	171.3	13	Australia	22.6
4	Germany	141.4	14	Turkey	21.7
5	South Korea	98.5	15	Netherlands	21.5
6	France	\$68.4	16	Switzerland	19.1
7	United Kingdom	53.1	17	Sweden	18.1
8	Taiwan	43.3	18	Israel	17.7
9	Russia	41.5	19	Belgium	16.5
10	Italy	36.0	20	Austria	16.0

Source: CRS analysis of Organisation for Economic Development and Cooperation, OECD.Stat database,

https://stats.oecd.org/Index.aspx?DataSetCode=MSTI_PUB.

Though, there is large investment of China in the Research and Development, yet they couldn't produce independent thinkers and scholars due to its more bureaucratic structure. For economic growth, Universities will focus on more innovative and

7 QS Higher Education Ranking available at <https://www.topuniversities.com/qs-world-university-rankings>

8 Academic Ranking of World Universities (ARWU) available at <http://www.shanghai ranking.com/>

9 Gerard A. Postiglione (2015)- Research universities for national rejuvenation and global influence: China's search for a balanced model- High Educ (2015) 70:235-250

creative thinking to develop new products and services for the global market. In contrary Hong Kong has three universities ranked among Asia's top ten and the world's top 50. This is mainly owed to improved academic culture and governance as well as their major instructional language, internationalization, leadership of administrators, and the qualification of academic profession of research universities in Hong Kong. To become world class research Universities, Peking University and Tsinghua University has delineated a three prong strategy. First: to become a comprehensive, research-oriented, internationalized higher education institution by 2010. Second: To stand in the top 100 universities in the world university rankings by 2020 and third: to achieve its overall world class status by the middle of the twenty-first century. To achieve these goals, the following three strategies have been developed¹⁰:

- i. To improve faculty quality
- ii. To strengthen fundamental sciences
- iii. To encourage interdisciplinary research
- iv. To promote internationalization
- v. To serve the national needs

For making world class University, both the central and provincial authorities closely collaborate for proving their share in investment and financing. Under 985 project, almost 4 billion USD were allocated for 34 Universities, in which 54.9% was allocated by the central Government, whereas the remaining was contributed by local Governments. To promote, science and engineering related education, 637 such institutions were merged to 270 universities with special focus on science and engineering education and research.

For making the WCU in China, internationalization has been given high emphasis. This involves attracting world renowned scholars in various fields and promoting joint research

10 Futao Huang-Building the world-class research universities: a case study of China- High Educ (2015) 70:203-215

collaboration with leading world universities in US and Europe. Chinese Academy of Sciences (CAS) offers a number of such opportunities for engaging outstanding research scholars to various emerging Universities of China. A total of 492,185 international students were enrolled in Chinese HEIs during 2018. Almost 60% of these students come from Asian countries including South Korea, Thailand, Pakistan and India etc. This increase in number of international students in China is creating many opportunities for china such as National Rejuvenation, expand their global outreach and market influence, enhance their professional impact and managerial efficiency, finally responding to the global diversity. This number has doubled from 2009 when foreign student's enrolment was 238,184 and only 1236 in 1978 at the start of opening up reforms.

At the same time China has been focusing on quality assurance in higher education. For attracting foreign students, Administrative Measures for the Enrolment and Development of International students by Universities and Schools were issued in 2017, which focused on four areas¹¹:

- Development of relevant university regulations
- Rigorous assessments for admissions and scholarships
- Systematic planning of teaching and staff development
- Development of quality control mechanisms.

Subsequently in 2019, Quality Accreditation Rules for International Higher Education were approved which offered first external qualification accreditation and assurance system for international education. On the basis of latest statistics by Nature, Chinese Academy of Sciences, Peking University and Tsinghua University are amongst the top 15 world top research institutes. Across China, the biotech institutes are investing heavily in the contemporary research and making their space in the top 15

¹¹ "Impact of Rising International Student Numbers in China", University World News, February 5, 2022, available at <https://www.universityworldnews.com/post.php?story=20210521085934537>.

research institutes. This is based on the Nature assembled research index of renowned research institutions¹². Among the leading 100 academic institutions in the 2018, 44 comes from the United States and 16 from China, Britain and Japan contribute seven each, with six from Germany, four from Switzerland and three from Canada, according to Nature Index. The global picture of ranking is changing and Chinese higher education and research institutions are making their space in the world ranking. With increased investment in R&D and focused approach of WCU, China is endeavoring to double the number of Chinese Universities in the 100 top Universities of the world within next 5 years.

Table: Top 15 Research Institutes of the world

Ranking	Institution
1	Chinese Academy of Sciences
2	Harvard University
3	Max Planck Society
4	French National Centre for Scientific Research
5	Stanford University
6	Massachusetts Institute of Technology
7	Helmholtz Association of German Research Centers
8	The University of Tokyo
9	University of California Berkeley
10	University of Cambridge
11	University of Oxford
12	Peking University

¹² Nature Index available at <https://www.natureindex.com/annual-tables/2018/institution/all/all>

Ranking	Institution
13	Swiss Federal Institute of Technology Zurich
14	National Institutes of Health
15	Tsinghua University

Source: Nature Index available at
<https://www.natureindex.com/annual-tables/2018/institution/all/all>

The huge investment in higher education and research institutes by China is creating competitive advantage for most of the top ranking Universities, yet more important is academic and intellectual freedom for the faculty and students. China will need more reforms and decentralization of Universities for intellectual grooming and developing conducive environment for innovative and creative thinking and discourse. The autonomy of the HEIs in decision making, appointment of faculty and administrative staff will be required to attract and nurture better people.