

Chapter 5

Undergraduate Education (*Benke*) in China



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Abstract Undergraduate education plays a fundamental role in China's higher education reform in the last four decades. Great progress has been made in undergraduate enrollment, quality, and effectiveness. Most recently, Chinese higher educational reforms have focused on developing world-class undergraduate education with Chinese features. This chapter presents an overall picture of the Chinese undergraduate education sector and analyzes its development and performance through an international comparative lens. It then provides case studies of best practices and inspiring stories of teaching excellence. This chapter also reviews national policies and existing literature on undergraduate education by Chinese scholars.

Keywords World-Class undergraduate education · Quality and performance · Undergraduate teaching and learning · Teaching excellence · Policy highlights on undergraduate education

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1 Introduction

The modern concept of undergraduate education first appeared in *University Ordinance (Daxueling)* issued by the Ministry of Education of the Republic of China in 1912, “Once completing the foundation year and passing all the examinations, students will be granted graduation certificates and will be admitted to undergraduate studies” (Zhu & Yao, 1993). In 1985, Ma Jixiong, a well-known expert on comparative and international education in China, used a Chinese perspective to analyze undergraduate programs relative to and beyond pre-college preparatory programs, and the specialized courses offered to students (Ma, 1983). According to the International Standard Classification of Education (ISCED) published by UNESCO, undergraduate programs are the first stage of tertiary education, and entry into these programs normally requires successful completion of senior secondary school or equivalent programs. These programs, traditionally offered by universities or equivalent tertiary education institutions, provide students with intermediate academic and/or professional knowledge, skills, and competencies with a duration of four or more years. Higher education in China consists of undergraduate and postgraduate education. Undergraduate education includes education in both academic and vocational routes and is considered the major sector in Chinese higher education (Huang, 2017). Regular higher education is the academic route and offers four-year programs leading to bachelor’s degrees. Tertiary vocational education is the vocational route, consisting of both four-year bachelor’s degree programs and three-year associate degree programs. This chapter’s analysis of undergraduate education mainly focuses on the academic route programs offered in the regular higher education.

1.1 History and Status of Undergraduate Education in China

1.1.1 History of Undergraduate Education in China

The modern Chinese undergraduate education has a history of more than 100 years, including three stages, that is, forming, rapid development and quality-driven development stages.

Forming Stage. Modern undergraduate education in China began in the late Qing Dynasty and early Republican era. *Presented School Regulation (Zouding Xuetaang Zhangcheng)* issued by the Qing government in 1904 defined undergraduate education as the second of three-level university education (Qu, 1993). In 1912, the Ministry of Education of the Republican government announced the *University Ordinance*, which established seven undergraduate education subject areas (i.e., arts, science, law, commerce, medicine, agriculture and engineering) and furthered its duration and required courses in 1913 (Li, 1997). The *Dictionary of Chinese Education (Zhonghua Jiaoyu Cidian)* issued in 1928 explained that undergraduate education and its courses were designed by grades, and its content was above preparatory programs, so that

graduates completing preparatory programs would be able to enter the specialized professional learning, e.g., teacher education and university degrees (Qu & Wang, 2015). Ever since, undergraduate education has been officially regarded as a major level of university education.

Rapid Development Stage. Undergraduate education underwent a series of changes since the founding of the People's Republic of China. After the opening-up in 1978, with the deepening of the ideological emancipation movement and the continuous socio-economic recovery, undergraduate education was fully restored. It has been experiencing rapid development, especially since the national economic structural reform (Yang, 2004). In 1978, the Ministry of Education (MOE) reaffirmed that the objective of higher education institutions (HEIs) was to cultivate "specialized personnel" (*Zhuanmen Rencai*) rather than general workers (National Institute of Education Sciences, 1984). In 1985, *Decision on the Reform of the Educational Structure* pointed out that HEIs should be provided with more autonomy. As such, universities should have the right to adjust educational programs, formulate teaching plans and syllabuses, and prepare and select teaching materials, etc. (Central Committee of the Communist Party of China [CPC], 1985). In another policy document from 1992, the then National Education Commission (now MOE) explicitly proposed to expand subject areas and develop quality and capable undergraduate students (National Education Commission, 1993). In 1998, the MOE issued *Action Plan for Education Revitalization in the 21st Century* and proposed that by 2010 the gross enrollment ratio (GER) of higher education in China would reach 15% of students at school age (MOE, 1998). Since then, the scale of undergraduate education has witnessed a rapid growth.

Quality-Driven Development Stage. At the beginning of the twenty-first century, with the excellence initiatives (e.g., Projects 211 and 985) implemented in the higher education sector, undergraduate education in China entered its quality-oriented development stage. In 2006, the government launched a series of policy documents emphasizing the importance of cultivating top talents, developing quality assurance, building world-class undergraduate curricula and programs, and encouraging innovation and entrepreneurship, to enhance quality and standards of undergraduate education and move focus from quantity to quality in higher education expansion. The Double World-Class Project was implemented in 2015. Along with the *Guidelines on Accelerating the Development of High-Quality Undergraduate Education and Comprehensively Improving the Capacity of Talent Training* (hereafter the *40 Guidelines on Higher Education Development in the New Era*), a macro guideline document on developing undergraduate education in 2018, the project reiterates the importance to form high-standard undergraduate education with Chinese characteristics and world-class standards by 2035. The project ultimately aims to provide strong support to develop a strong nation through higher education (MOE, 2018a). In 2018, MOE, Ministry of Finance (MOF), and National Development and Reform Commission (NDRC) jointly issued *Guidelines on Accelerating the Development of the Double World-Class Project*, which clearly defined the goal of developing world-class undergraduate education, emphasized the fundamental role and status of undergraduate education, made the development of world-class undergraduate

education the essential task of the Double World-Class Project, etc. (MOE et al., 2018a). Ever since, undergraduate education in China has been marching toward the goal of achieving “world-class” status.

1.1.2 The Status of Undergraduate Education in China

From a global perspective, world-class universities tend to place undergraduate education at an important strategic position and make developing world-class graduates as an unchangeable goal of the universities. The thousand-year history of universities in the world also shows that undergraduate education lays the foundation for higher education development, and to some extent decides the progress of its country (Chen, 2018a). Since the beginning of the twenty-first century, refocusing on undergraduate education and launching teaching reforms have become common agendas for leading universities around the world, including Harvard, Stanford, and MIT. (Chen, 2018b).

In June 2018 at a national convention, MOE stressed that undergraduate education should be placed “at the center of workforce development, as the groundwork of university education, and at the forefront of education development in the new era” (Chen, 2018b). The term “undergraduate education as the foundation” (*Yiben Weiben*) summarizes its significant status in the Chinese higher education and its pursuit of academic excellence (MOE, 2018b). According to statistics on the 1,200 undergraduate institutions, the ratio of undergraduates to graduate students nationwide is 8:1, and 87% of students graduating are undergraduates (Chen, 2018b).

1.2 The Notion of World-Class Undergraduate Education

In the 2016 working meeting on teaching reform, MOE explicitly stated that world-class undergraduate education is the foundation and basic feature of world-class universities, and that developing world-class undergraduate education be included in the Double World-Class Project action plan (Ma, 2016). Further, 150 universities jointly issued *World-Class Undergraduate Education Statement* (also called *Chengdu Statement*) (MOE, 2018b) that advocated for nurturing top talent and developing excellence in undergraduate education. Arguably, the notion of “world-class undergraduate education” is derived from the Double World-Class Project context and has experienced a transformation from a top-down policy to intrinsic motivation within universities (Yang, 2021). While this term originates from the integral role of undergraduate education in promoting academic excellence, it is rooted in the fundamental problem that Chinese universities are relatively lagging behind the world’s leading universities in terms of cultivating high-quality workforce (Zhou, 2019). To cater to the changing context of universities and their own development needs, various ideological transformation has been taking place throughout undergraduate education, including making interdisciplinary programs mainstream, emphasizing

student-centered ideology, and confirming the strategic importance of developing excellence.

The goal of world-class undergraduate education is to pursue excellence in teaching and learning (Zhang, 2019). It means high-standard and high-quality educational activities under specific goals, promoting quality culture, and enhancing overall quality in undergraduate education and workforce development (Yang, 2021). In the Chinese context, world-class undergraduate education should follow the four principles of “return to common sense, return to the essence, return to the original heart, and return to the dream”, build a general pattern of “three-holistic education” (*sanquan yuren*),¹ and understand rationales of higher education development and talent growth. Within such a system, students are encouraged to study hard, and teachers are inspired to teach and nurture well-round graduates for nation building (MOE, 2018a).

Based on the above context, this chapter first depicts the development of China’s undergraduate education and analyzes its performance through key indicators from an international comparative perspective. It then provides case studies to illustrate the exploratory paths of Chinese universities and share inspiring stories of teaching excellence, particularly on the aspects of talent development, quality assurance, and innovation and entrepreneurship. The chapter lastly reviews policies on Chinese undergraduate education and related research by Chinese scholars, to reflect its policy trends and theoretical thinking.

2 Highlighting Data

2.1 Size and Scales

In the past decade, the Chinese higher education system has been continuously and rapidly expanding its undergraduate sector, providing strong intellectual support for its socio-economic development. Since the economic reform and opening-up, China has trained more than 60 million undergraduate students, who have become central to China’s socio-economic development (Shi, 2018).

The total number of undergraduate students reached 19.06 million in 2021, an increase of more than 40% from 2011. The total undergraduate admission has also grown steadily, with an additional 4.49 million students admitted in 2021, which

¹ “Three-holistic education” means education provided by “whole” community, through “whole” process and with “well-round” focus. In other words, everyone in the community engage in teaching and learning, including students themselves, teachers, school staff, and other community members; teaching and learning happens any time (throughout the school years) and any place (all aspects of school life, including teaching, management, and financial support to students); and teaching and learning should focus on comprehensive effectiveness and include moral education, intellectual education, physical education, aesthetic education, labor education and other comprehensive education.

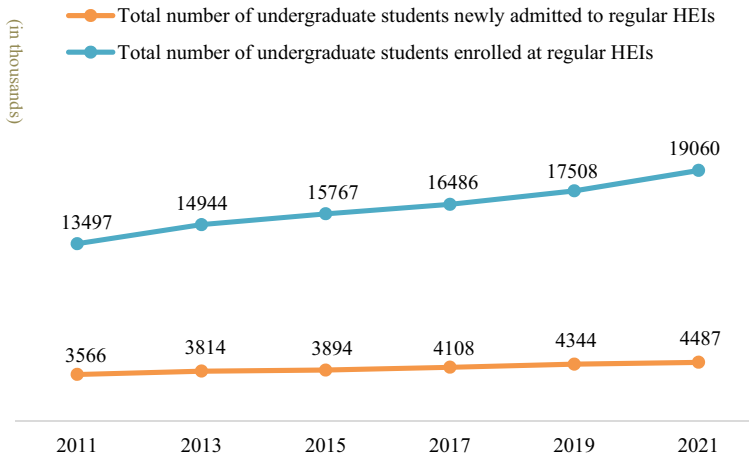


Fig. 1 Number of undergraduate students at regular HEIs (2011–2021). *Source* Adapted from MOE (2021a)

seeks to keep pace with the growing public demand for university education (see Fig. 1).

A comparison with the world's major developed countries shows that, from 2014 to 2020, despite a slow decline each year, the total number of newly admitted undergraduates in the United States (U.S.) far exceeded those in other countries; China's undergraduate admission increased steadily and exceeded those in many developed countries; and the admission number in Japan and the Republic of Korea (ROK) exceed those in Germany, the United Kingdom (U.K.), France, Australia and the Netherlands (see Fig. 2).

In terms of institutional layout, there are five different types of undergraduate institutions in China, namely, universities pursuing world-class status, universities developing world-class disciplines, regular undergraduate universities, newly-established universities and colleges, and independent colleges (Fan et al., 2021). Among them, ordinary undergraduate colleges and universities have the largest enrollment volume, accounting for more than 40% of the total undergraduate enrollment in 2021, which is closely related to the enrollment plan of college entrance examination. In the past decade, the number of institutions training undergraduates in China has shown a steady growth, reaching 1,270 in 2021 (Fig. 3).

2.2 Outline of Academic Disciplines

In terms of academic disciplines at the undergraduate level, engineering science has the largest student enrollment, which advances the national strategy to develop manufacturing power. Overall enrollment and graduates of engineering majors in regular

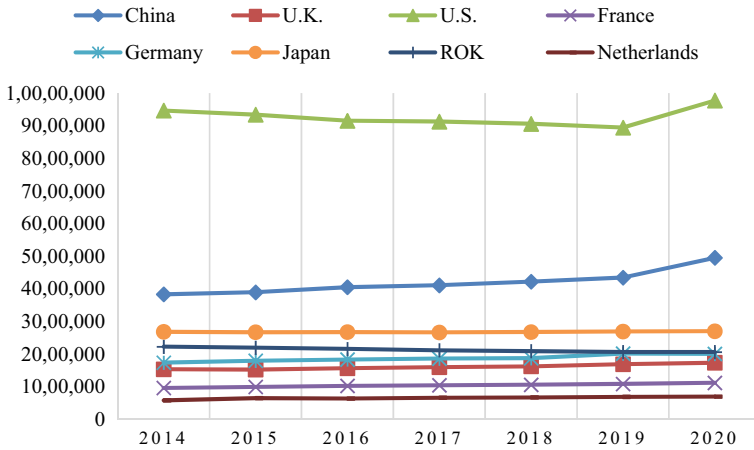


Fig. 2 Undergraduate admission in China and some developed countries (2014–2020). *Source* OECD (2021)

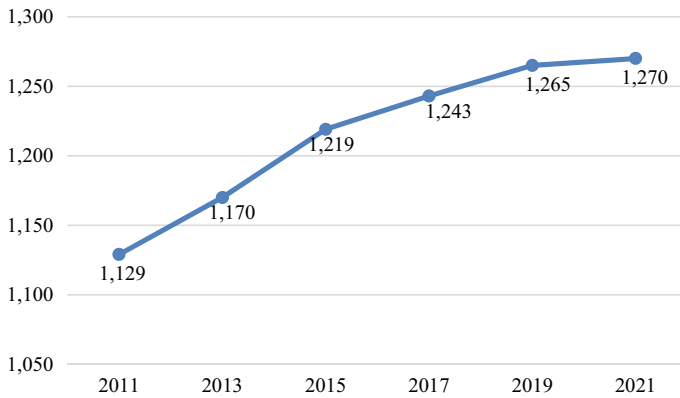


Fig. 3 Numbers of HEIs in China (2011–2021). *Source* Adapted from Fan et al. (2021), MOE (2022)

HEIs in China are much higher than those of other countries in the world and are three to five times higher than those of Russia and the United States which follow closely behind (Ding & Zhao, 2018). Information from MOE shows, with the largest scale of engineering education in the world, China had about 1.28 million freshmen students, an overall enrollment of 7.02 million students as well as 1.37 million new graduates from 18,822 engineering programs in 2020 (*ibid*). All the number for the above four aspects represent 1/3 of the overall national undergraduate volume. Meanwhile, China continues to make great efforts to improve the quality of undergraduate engineering education. Hoping to join the Washington Accord, China has been promoting

program accreditation exercises and strengthening comprehensive reform in engineering education (MOE, 2018c). As of 2020, 1,600 engineering degree programs in 257 regular HEIs in China have been accredited and recognized, which cover 22 specialized engineering majors including machinery and instrumentation (MOE, 2021b). According to the Director of the Department of Higher Education at MOE, engineering education in China should contribute its expertise to the global stage and play a leading role in the development of engineering education in the world (Li, 2018).

Chinese student enrollments by academic discipline vary greatly from EU students. In 2018, one fifth (22%) university students studied business, administration or law. The second most common field of study was engineering, manufacturing, and architecture related areas, accounting for about 15.8% of total higher education students (Eurostat, 2020). Similar to EU countries, more than a quarter (25.5%) of university students study in the fields of business, administration or law in the U.S. (OECD, 2018).

2.3 Faculty Development

Overall, China has the largest number of full-time faculty in the world, but its student–teacher ratio is also high. By 2020, the number of full-time faculty at regular HEIs reached 1.61 million, with a growth rate of 3.8% from the previous year. However, when taking into consideration the large student body at Chinese universities, the student–teacher ratio is rather high. In 2020, the student–teacher ratio at regular HEIs in China was 18.6:1, among which the ratio is 18.1:1 at regular undergraduate institutions, and 19.1:1 at newly-established institutions. However, the ratio is less than 10 at world leading universities (Fan & Wu, 2019).

In recent years, three main trends have emerged in terms of faculty preparation and demographics: the number of faculty holding higher education degree has gradually increased; a growing number of faculty have international academic and work experience; and young faculty members are a major force in Chinese higher education. In 2020, 41.8% of the full-time faculty hold a doctoral degree, 3.57% increase from 2018. Of universities pursuing world-class status funded by the Double World-Class Project, 74.9% of their full-time faculty with doctoral degrees; this number rises to 81.5% for universities aspiring to be world-class (Fan et al., 2021). In 2020, more than 20% full-time faculty have studied, worked or visited overseas universities for at least one year. The number of professors and academics from prominent overseas universities teaching and researching in China has also increased significantly. Faculty members have increasingly embraced a global view and enhanced their intercultural skills. In terms of age, nearly 70% of the full-time faculty are junior (under 35) and young (between 36 and 45) faculty (*ibid*). This shows junior and young faculty members are now the major force in Chinese higher education, and it also suggests a favorable growth trend and huge potential in terms of faculty development.

2.4 Educational Expenditure

The expenditure on undergraduate education continues to increase, at a higher growth rate than that of many developed countries. Educational expenditure is a fundamental and strategic investment that supports the country's long-term development and lays foundation to a country's education (Fan & Wu, 2019). China's overall expenditure on higher education increased from RMB951.8 billion to RMB1,346.2 billion, with an average annual growth rate of 9.1% (see Fig. 4). When compared with developed countries' expenditures in 2015 and 2019 (2.1% increase rate for OECD countries and 1.9% for EU countries), China's expenditures on higher education increased much faster.

Comparing data in Fig. 4 and Table 1, it is clear that the government spending in higher education in recent years has slowed down in developed countries. Average educational expenditure in OECD countries is slightly higher than that of EU countries.

Funding for undergraduate education in China primarily comes from the national government, and efforts have been made to further diversify its funding structure. In terms of funding sources, national expenditure on higher education (equivalent to

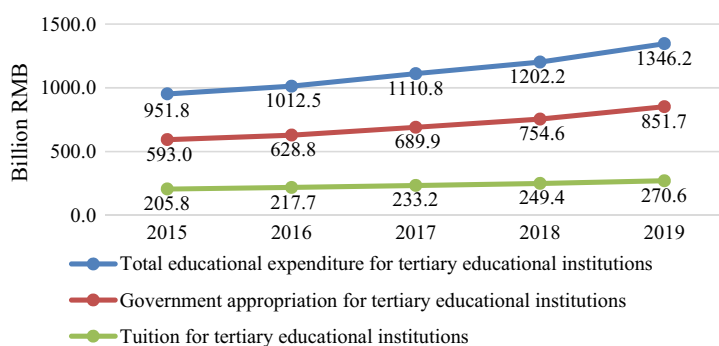


Fig. 4 Educational expenditure in Chinese higher education (2015–2019) (in RMB billion). *Source* MOE (2016, 2017, 2018d, 2019a, 2020a)

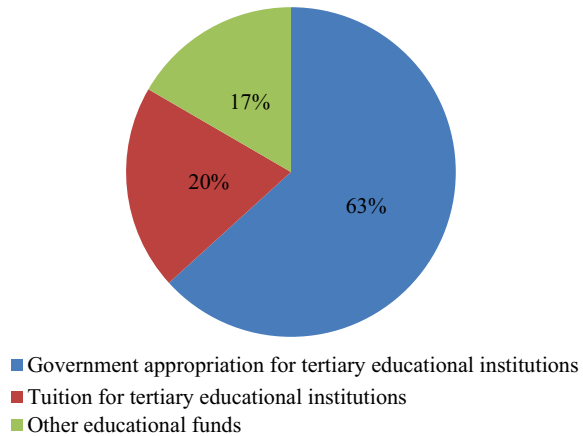
Table 1 Higher education expenditure in developed countries (in US\$ million)

Year	2015	2016	2017	2018	2019
Average UN 20 countries	9,527	9,382	9,608	9,950	10,278
Average OECD 29 countries	12,472	12,493	12,866	13,234	13,546

Notes

1. To ensure year-to-year comparability, all spending measured in monetary terms (e.g., total expenditure) is adjusted by the Consumer Price Index (CPI) and measured in 2015 Constant Prices. All increase rate in this chapter is measured in Constant Prices
2. This table is compiled based on data from OECD and EU. Some countries' data are missing, including Bulgaria, Croatia, Cyprus, Malta, Romania, Ireland, and Denmark

Fig. 5 Chinese higher education expenditure structure in 2019. *Source* MOE (2020a)



public expenditure in the OECD documents) is the main source of overall educational funding in China, accounting for more than 60%; while tuition fees (equivalent to household expenditure in the OECD documents) only account for 20% of the overall educational funding (see Fig. 5). Based upon Fig. 4, it can be argued that tuition fees have been increasing slowly, and the increase of national financial expenditure on education has led to the overall increase in educational investment.

2.5 Infrastructure

Infrastructure is fundamental to support teaching and research activities in undergraduate education. Figure demonstrates space utilization; laboratory facilities account for the largest space utilization with 5m² per student, followed by classroom facilities (4.5m² per student) and office and library facilities (about 2m² per student). The space for special use facilities and general use is relatively small: 1.5m² per student for specialized research rooms, 0.9m² per student for gymnasiums, and 0.3m² per student for assembly halls and meeting rooms (Fan et al., 2021). This suggests that the infrastructure at Chinese HEIs can meet the demand for teaching and research, but improvement is needed to expand general and athletic facilities.

As shown in figure, independent colleges and newly-established universities provide the largest classroom space per student, followed by regular undergraduate universities, universities pursuing world-class status, and universities developing world-class disciplines. Conversely, in terms of laboratory facilities and special research rooms, universities pursuing world-class status enjoy the largest space, followed by universities developing world-class disciplines, regular undergraduate universities, newly-established universities and independent colleges.

2.6 *Online Teaching and Learning*

In recent years, Chinese HEIs have strengthened online teaching platforms and vigorously developed online teaching resources. In 2019 and 2020, China held China MOOC and Global MOOC Conferences, and published the *Beijing Declaration* (Wu, 2020). Online teaching and learning also plays an important role in undergraduate education development and reform. During the COVID-19 pandemic, online teaching has expanded tremendously and reached a historic high in terms of the number of teachers, students, and courses. A national survey on teaching in HEIs (Fan et al., 2021) shows, online teaching and learning was offered in a large scale at undergraduate colleges and universities nationwide, with 1.08 million teachers offering 1.1 million courses, totaling 17.19 million courses, and a total of 3.5 billion course registration by students. The online course offering rate at Chinese HEIs was 91%; 80% of teachers acknowledge the importance of online teaching; and students' satisfaction on online teaching reached 85%. Online teaching and learning has provided opportunities for students' learning and overcome challenges and disruptions caused by the pandemic (*ibid*). In the post-COVID era, a hybrid model integrating both online and in-person teaching continues to develop, and significant changes are taking place in terms of curriculum design, teaching and learning styles, roles of professors and students, and classroom management (*ibid*).

2.7 *Public and Private Funding Resources*

In terms of funding resources, community input has become an increasingly important force in higher education governance and management. A structure of "government funding as the main financial resource with support from various societal forces" has been formed (Fan et al., 2021). Implemented in 2012 and further amended in 2016, *Private Education Promotion Law of the People's Republic of China* has "supported the development of private education" and "reassure the autonomy of private-run schools". These policies have strongly inspired the development of private education. Figure 6 shows that the proportion of private HEIs in China, which mainly focus on training a technically skilled workforce, has increased from 3.9% in 2005 to 33.4% in 2020 with the number of private HEIs also increasing each year. There are 416 private regular undergraduate institutions in 2020, accounting for 30% of the overall regular HEIs nationwide (*ibid*) (Fig. 7).

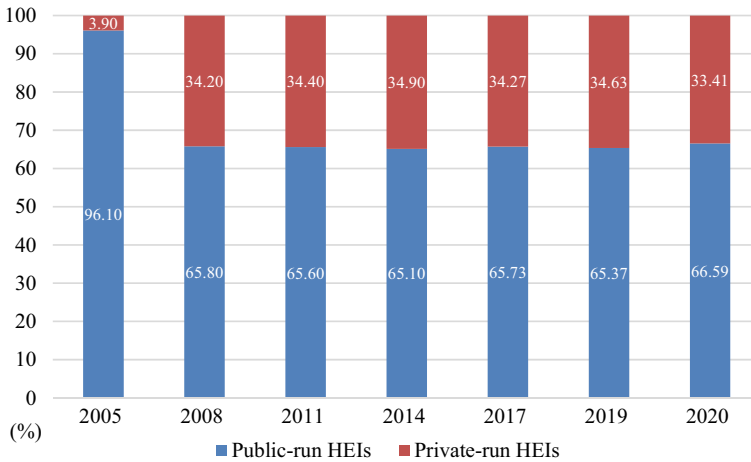


Fig. 6 The percentages of public- and private-run HEIs in China (2005–2020) (%). *Source* Compiled from National Bureau of Statistics (2005–2020)

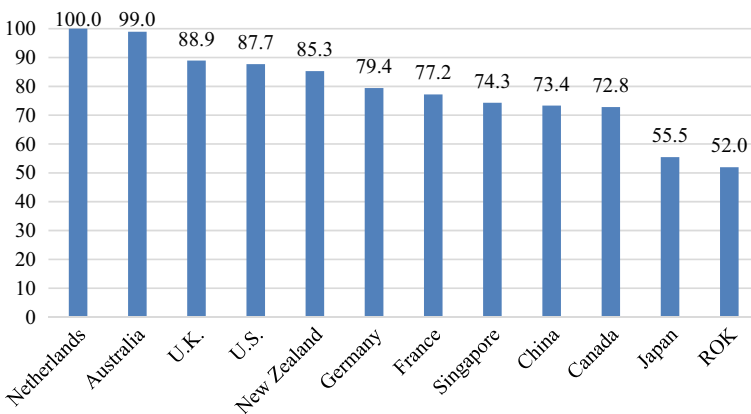


Fig. 7 Overall performance of undergraduate education

3 Excellence Indicators

3.1 Design

The quality of undergraduate education not only determines the quality of postgraduate (master’s and doctoral) programs, but also has a direct impact on a society’s science and technology advancement and its productivity, as well as on its higher education funding and drive for development (Weng, 1999). This section analyzes and evaluates undergraduate education in China through a global comparison.

3.1.1 Indicators to Evaluate Undergraduate Education

Various research has attempted to evaluate undergraduate education quality in the past few decades. Chickering and Gamson (1987) explored “seven principles for good practices in undergraduate education”. Ewell and Jones (1996) based on their empirical studies and designed “indicators of good practice”, covering the four domains of institutional requirements, instructional “good practice”, student behavior, and self-reported cognitive development. Since 2019, China Association of Higher Education (CAHE) has published the first national “Teaching Development Index” to measure teaching quality at regular HEIs in China. This index focuses on six dimensions, including teaching forces, teaching reform projects, teaching material reform, research papers on teaching, teaching achievement awards and teacher training centers, and one special dimension of teaching competition, which is also called a “6 + 1” model (CAHE, 2019). In recent years, Chinese scholars have been actively exploring an evaluation system to measure comprehensive capacity of higher education in China. In 2014, Zhang et al. (2014) constructed an evaluation system to measure regional higher education capacity in China from seven dimensions, including regional higher education scale, faculty development, internationalization, informatization and digitalization, social services, funding from local government, and funding from private resources. This evaluation system is applied to evaluate higher education capacity in each province with data from 2010. Relevant analysis shows that higher education evaluation usually adopts a grand framework of “scale, structure, quality, and efficacy”, a process framework of “input, process, and output”, a function framework of “workforce development, research, social services, and culture heritage”, and a supply–demand framework of “supply, demand, engagement, performances, and productivity” (Huang & Sun, 2018). However, there is little country-specific studies on undergraduate education evaluation and comparison.

Thus, this chapter intends to construct an evaluation system to measure undergraduate education in three dimensions of “scale, resources and performance”. The selection of indicators follows the following principles: to adopt objective statistical data; to select indicators from public statistic databases; to select core indicators; to examine the development of undergraduate education within the past five years. In addition, some specific indicators are employed, including the average growth rates of undergraduate student enrollment and graduates with a bachelor’s or equivalent degree within the past five years (see Table 2).

3.1.2 Sampling

To analyze undergraduate education in China in a global context, this chapter selects 11 countries with relatively developed undergraduate education systems, including the U.S., the U.K., Germany, France, the Netherlands, Japan, the Republic of Korea (ROK), Australia, Canada, Singapore, and New Zealand, mainly involving countries in North America, Europe, Asia, and Oceania.

Table 2 Excellence indicators of undergraduate education

Dimensions	Indicators	Data sources
Scale	1. Undergraduate enrollment 2. Graduates with a bachelor's or equivalent degree	OECD, and national statistic agencies
Resources	3. Percentage of world-class universities among quality undergraduate institutions 4. Percentage of quality undergraduate institutions per one million population	ARWU, QS
Performance	5. Percentage of labor force at 25–64 year-olds with a bachelor's or equivalent degree 6. Average annual growth rate of undergraduate enrollment 7. Average annual growth rate of graduates with a bachelor's or equivalent degree 8. Percentage of international students	OECD, and national statistic agencies

Source Compiled from ARWU, OECD, QS, and several national statistic agencies

3.1.3 Data Collection and Analysis

This study collects data from the OECD websites. If the data of individual countries are missing from OECD, it is then collected from its national statistics agency and sometimes from the official websites of Academic Ranking of World Universities (ARWU) and QS. Most of the data collected here are for 2019, with some data for 2020.

When analyzing, data for the eight indicators are firstly standardized; then the scores of each indicator for each sample country are added for the initial value of its undergraduate education index; and last, the initial values are further standardized for comparison.

3.2 Definitions

3.2.1 Enrollment by Age—Overall Undergraduate Enrollment

The data on overall undergraduate enrollment are mainly collected from the OECD website. It adopts the OECD definition as “number of students enrolled in bachelor's or equivalent level programs”. The data for China are from the MOE, and that of Singapore is from the website of Singapore Department of Statistics.

3.2.2 Graduates at Bachelor's or Equivalent Level

The data on graduates at bachelor's or equivalent level are mostly from the OECD website. It adopts the OECD definition as the number of people who graduated from an education program at bachelor's or equivalent level. The data for China are from the MOE, and that of Singapore is from the website of Singapore Department of Statistics.

3.2.3 Percentage of World-Class Universities Among Quality Undergraduate Institutions

This indicator measures performance of quality undergraduate education programs in the sample countries. Based on the existing literature on world-class universities, this study defines those institutions entering the top 200 in ARWU and QS Rankings as “world-class universities”, and those institutions entering the top 1000 in ARWU and top 1300 in QS Ranking as “quality undergraduate institutions”. These data are collected from ARWU and QS websites, using the latest year's results available.

3.2.4 Percentage of Quality Undergraduate Institutions Per One Million Population

This indicator measures the relationship between population and quality undergraduate education. The data on the sample countries' population are from the OECD website and the data on quality undergraduate education are collected same way as the previous indicator.

3.2.5 Percentage of 25–64 Year-Olds with Bachelor's or Equivalent Degrees

Data for this indicator mainly comes from the OECD statistics. This indicator presents internationally comparable data regarding the labor force status and the educational attainment level by the National Educational Attainment Categories (NEAC) as reported by the Labor Force Survey (LFS) and published in OECD's *Education at a Glance 2021*. For trend data, the *Education at a Glance* database includes data from 1981 to 2020 (or years with available data).

Nevertheless, some data is missing, for example Singapore; and there are also inconsistencies in the year of data, for example, the latest data for Japan is of 2019, while other countries 2020 data.

It should be noted that, as the data of China in this indicator were lastly updated in 2010, it is relatively out of date and less comparable with the data of the other countries. Therefore, we need to project the data based on the information and data collected. According to *China Statistical Yearbook 2020* published by National

Bureau of Statistics of China (2021), a survey of the national population over six years old found that 6.27% of the population hold a bachelor's degree. The number of the population over six years old is more than the number of labor force, thus the number of 6.27% cannot be used directly. OECD's statistics show that, in 2019, China has a 1.35 billion population over five years old and about 0.84 billion labor force aged 25–64 (OECD, 2021), which can estimate the percentage of labor force in China is about 62.5%. It can be inferred that the percentage of labor force with a bachelor's or equivalent degree is around 10% in 2019.

3.2.6 Average Annual Growth Rate of Undergraduate Enrollment

This indicator measures the average annual growth rate of undergraduate enrollment for each country over the period of 2014 ~ 2019. Data for the sample countries are mainly collected from the OECD, while data for China are obtained from MOE and Singapore from its Department of Statistics.

3.2.7 Average Annual Growth Rate of Graduates with a Bachelor's or Equivalent Degree

This indicator measures the average annual growth rate of graduates with a bachelor's or equivalent degree in the period of 2014–2019. Data for the sample countries are mainly collected from the OECD, while data for China are obtained from MOE and Singapore from its Department of Statistics. In addition, the 2014 data for Japan are collected from Japan's Web Archiving Project (<https://warp.ndl.go.jp/>), and that of France is from its National Institute for Statistics and Economic Studies. The average annual growth rate of graduates with a bachelor's or equivalent degree is calculated as.

3.2.8 Share of International Students Among All Students–Bachelor's or Equivalent Level

Data for this indicator mainly come from the OECD statistics. This indicator presents percentage of international students among overall undergraduate enrollment. It reflects to what extent a country's undergraduate education is internationalized.

3.3 Findings

The development of Chinese undergraduate education can be analyzed through the above-mentioned eight indicators and can also be reflected through a comparison with that of the other sample countries.

Table 3 Comparing Chinese undergraduate education's development with the 11 selected countries

Dimension	Indicators of undergraduate education	Ranks of China's undergraduate education over all the 12 countries
Scale	1. Undergraduate enrollment	2
	2. Graduates with a bachelor's or equivalent degree	1
Sources	3. Percentage of world-class universities among quality undergraduate institutions	10
	4. Percentage of quality undergraduate institutions per one million population	12
Performance	5. Percentage of labor force at 25–64 year-olds with a bachelor's or equivalent degree	12
	6. Average annual growth rate of undergraduate enrollment	5
	7. Average annual growth rate of graduates with a bachelor's or equivalent degree	4
	8. Percentage of international students	/

3.3.1 Performance of China's Undergraduate Education in the Eight Indicators

Quantitative analysis on the eight indicators found that China's undergraduate education ranks among the top in the two indicators of “the number of graduates with a bachelor's or equivalent degree” and “overall undergraduate enrollment” and ranks at an intermediate level in terms of “average annual growth rate of undergraduate enrollment” and “average annual growth rate of graduates with a bachelor's or equivalent degree”. However, its performance on “percentage of world-class universities among quality undergraduate institutions”, “percentage of quality undergraduate institutions per one million population” and “percentage of labor force at 25–64 year-olds with a bachelor's or equivalent degree” is not satisfactory. (see Table 3).

3.3.2 Overall Performance of China's Undergraduate Education

The comparative analysis shows that the Netherlands' undergraduate education has the best overall performance, mainly because of its leading performance in terms of “percentage of world-class universities among quality undergraduate institutions” as well as its performance in terms of “percentage of labor force at 25–64 year-olds with a bachelor's or equivalent degree”, “percentage of international students”, “average annual growth rate of undergraduate enrollment”. China's overall performance in undergraduate education is relatively strong among Asian countries, mainly because its performance on “overall undergraduate enrollment”, “average annual growth rate of undergraduate enrollment” and “average annual growth rate of graduates with a

bachelor's or equivalent degree" are not only higher than most of the Asian countries, but also higher than Canada.

3.4 Discussion

Since the socio-economic reform in the 1980s, the development of undergraduate education in China has made remarkable achievements with the government's strong support and promotion especially in the past two decades. In recent years, the undergraduate education sector in China continues to emphasize on its quality transformation with the policy goal of "building world-class undergraduate education". Focuses have been laid on student-centered teaching and learning, actively implements teaching and curriculum reform and aspires to promote world-class undergraduate programs; meanwhile it also attaches great importance to delivery of Chinese traditional culture and traditions and is committed to providing quality education with Chinese characteristics.

The comparative analysis in this chapter suggests that the most obvious problem of China's undergraduate education is its lack of world-class universities. It is true that China has made tremendous progress in the past two decades to develop academic excellence through the government funded excellence initiatives, such as Projects 211 and 985 as well as the Double World-Class Project, however, compared with the other sample countries, China still has lower "percentage of world-class universities among quality undergraduate institutions" and efforts to build world-class universities are still to be strengthened. While the indicators need further elaboration due to limitations related to data availability, these findings are of practical significance for informing the future development of China's undergraduate education.

4 Best Practices

4.1 Advocating Independent, Cooperative and Inquiry-Based Learning Styles to Cultivate Top-Notch Undergraduate Talent

4.1.1 Building an Interdisciplinary Environment and Inspiring Innovative Thinking in Students

In order to enhance students' awareness and vision of interdisciplinarity, the University of Science and Technology of China (USTC) has been exploring new interdisciplinary models for talent development. USTC launched the Interdisciplinary Excellence Training Program for the Gifted Young Class in 2016. This program requires 40 additional credits of courses in a second major in addition to the primary

major, and the dissertation topic should be in a cross-disciplinary direction related to both majors, aiming to cultivate leading talents in various industries with a broader knowledge background and strong capabilities to respond to the rapid development of future society (USTC, 2022). An undergraduate research program focused on interdisciplinary innovation is also an important approach to develop world-class undergraduate education at the University of California, Irvine (UC Irvine). The Multidisciplinary Design Program at UC Irvine was launched in 2011 with a team of five undergraduate students from different disciplines and two faculty members from different colleges to focus on specific social issues and encourage students to develop new topics and perspectives in their research projects (Wang, 2020).

4.1.2 Developing Research Training Based on a Cognitive Apprenticeship Method to Enhance Problem-Solving Skills in a Community of Practice

In order to overcome the weakness of the “assembly-line like” traditional training method, Shanghai Jiao Tong University (SJTU) adopts the cognitive apprenticeship training method to enhance students’ learning motivation and their skills and abilities to solve complex problems in the process of learning, practice, relearning, and re-practice. Undergraduate students participate in research in three steps. First, the advisor creates a real-life problem and demonstrates the basic logics and strategies to solve such problem, while students as “novices” observe, imitate, and learn the methods and approaches the advisor adopts. Second, the advisor builds a “scaffolding” to provide students with research ideas and framework and students then practice and experience the whole research procedures under the advisor’s guidance, including searching for research literature, implementing experiments and analyzing data. Finally, the advisor extends the research questions and contexts, removes the “scaffolding”, and assigns more complex research tasks (Shen et al., 2021).

4.1.3 Developing Academic Communities and Constructing Academic Identities

By bringing together the world’s top scientists (including Nobel Prize and Turing Award winners) and a group of students who aspire to reach the top of the academic ladder, Zhiyuan College at SJTU nurtures “future masters” with “masters”, and students’ academic identities are gradually internalized throughout the process. The entire college, each class, each discussion group, each project group, each classroom and even each dormitory at the college can form a learning community. Through guiding scientific research, classroom discussions, and after-class communications, advisors not only teach students knowledge and methods, but also use their own words and deeds to influence students’ emotions, attitudes, and values. Impacted by top scientists’ research attitudes, students are more willing to follow their example to engage in academic research (*ibid*).

4.2 Improving Multi-level Teaching Evaluation Systems to Ensure the Quality of Undergraduate Education

4.2.1 Strengthening Descriptive Evaluation to Enhance Academics' Teaching Skills

A simple score and grade evaluation has the disadvantages of weakening the integrity and complexity of classroom teaching and restricting teachers' subjectivity and professional development, while descriptive teaching evaluation focuses on the cognitive, emotional, and interpersonal interactions of teachers and students in classroom teaching, understands and interprets their behaviors, and provides non-quantitative evaluation results and recommendations (Yan, 2012). In order to help teachers conduct self-analysis and self-improvement, Nanjing University (NJU) further highlights ethics and morals as well as teaching performance in its peer review evaluation, and adds a "descriptive evaluation" section (NJU, 2021).

4.2.2 Building Diversified Evaluation Mechanisms to Guarantee Comprehensive Classroom Teaching Quality

To improve the objectivity, accuracy and reliability of classroom teaching evaluation, Wuhan University (WHU) integrates student evaluation with third-party evaluation. The result of student evaluation is an important reference for teachers' teaching assessment, excellent undergraduate teaching performance award and various merit awards, and also an important reference for faculty's professional appointment and promotion. In response to the student evaluation results, the university has provided individual feedback to the corresponding schools/departments and requested the schools/departments to carry out relevant inspection and improvement plans (WHU, 2019). A third-party evaluation was also introduced to invite experts from peer universities to assess teaching in the universities' general courses. Experts from Wuhan University Institute of Education Science are also invited to review teaching quality of general courses, such as Advanced Mathematics and English (*ibid*).

4.2.3 Strengthening Qualification Requirements for Undergraduate Teaching to Improve New Faculty's Teaching Skills

To ensure new faculty's teaching skills, WHU has raised its qualification requirements for teaching undergraduate courses and new faculty members need to pass "four hurdles" before they can take the podium. The first hurdle is to attend the intensive teacher training organized by the Human Resource Department. Second, they need to participate in various teaching training programs organized by the Center for Teaching and Learning Development, including lectures on teaching, observation, teaching workshops and seminars. For the third hurdle, new faculty members serve

as a teaching assistant for an undergraduate course, assisting the main instructor by completing course tutoring, answering questions, grading assignments, and guiding experiments. The last requirement is a teaching assessment; the new faculty member teaches part of the course as a second instructor with supervision from the main instructor. The Center for Teaching and Learning Development oversees the assessment processes and basis their decision upon on expert reviews, student evaluations, and faculty recommendations. Those who do not pass the assessment will repeat this final step. After passing all the four hurdles, the new faculty member will be qualified to teach undergraduate courses independently at WHU.

4.3 Integrating Practice into Teaching and Learning to Enhance Undergraduate Students' Innovation and Entrepreneurial Skills

4.3.1 Advocating Experiential Learning to Improve Students' Practical Skills

Experiential learning focuses on allowing students, based on their practical experience, to solve real-life problems through the process of operation, illustration and application, and, therefore, actively construct knowledge and acquire learning methods and skills (Chen & Huang, 2008). The X-Lab at Tsinghua University intends to introduce project-based experiential learning to develop students' practical skills. This is a teaching method that breaks the traditional concept of teacher imparting knowledge and students learning knowledge (Tsinghua University, 2018). Ivy League schools in the U.S. also emphasize students taking on an active role in teaching and learning. For example, the Presidential Scholar Program at Dartmouth College provides undergraduate students with “one-on-one” mentoring by professors, exposing them to the frontiers of the disciplines and gradually developing their problem awareness and problem-solving skills (Ye et al., 2020).

4.3.2 Promoting Interdisciplinary Integration to Enhance Students' Creativity

Relying on Tsinghua University's School of Economics and Management, the X-Lab is jointly built by several faculty on campus, creating a space for interdisciplinary teamwork and exchange of student innovation and entrepreneurship. The platform promotes cross-collaboration among 16 faculties including the School of Economics and Management and the School of Mechanical Engineering (Tsinghua University, 2020). Students are guided to combine art and science, engineering and business, technology and production, and learn management thinking, innovation

and entrepreneurship, so as to establish a complex cognitive system of “technology + management” (*ibid*).

4.3.3 Establishing a Collaborative Learning Mechanism Between Universities and Industry to Develop Students’ Skills to Solve Complex Real-World Problems

In order to make students’ entrepreneurial projects more objective and realistic, Tsinghua University cooperates with enterprises to explore new education models. Tsinghua University’s X-Lab collaborates with enterprises to explore new courses on innovation and entrepreneurship, such as working with Facebook to design and offer a new course titled “Innovation and Entrepreneurship: Silicon Valley Insights” (*ibid*). At the same time, X-Lab also invites outstanding entrepreneurs to guide students’ entrepreneurial projects, being the first university in China to introduce the “Entrepreneur-in-Residence” and “Angel-in-Residence” programs, which participate in practice education, provide advice and suggestions, and introduce relevant resources to students. The program is designed to turn creative ideas and technologies into products and services demanded from the society (Tsinghua University, 2020). The emphasis on undergraduate entrepreneurship programs is also a hallmark of the Nanyang Technological University. Nanyang Technological University’s Entrepreneurship Minor Program for undergraduates, is taught by business leaders, entrepreneurs, intellectual property lawyers and professional academics, and aims to equip students with basic entrepreneurial skills, business acumen, and stamina (Shi, 2021).

5 Inspiring Stories

5.1 Yao Chichi: Holding Primary Responsibilities of Teaching and Learning

Yao Chichih, the first recipient of the Distinguished Master Teachers² award by the MOE, is a world-renowned scientist and a front-line teacher. He teaches foundational undergraduate courses, and his “Yao Class” model, that is an Experimental Class of Computer Science, is regarded as “the best undergraduate education program” in the world. Yao is considered as a leader in innovative talent training (MOE, 2019b).

² The Distinguished Master Teachers award mainly recognizes faculties who have made outstanding achievements in talent cultivation, specially nurturing national strategic and scarce talents, have global outstanding teaching influence and are devoted to teaching in the front line.

5.1.1 Committed to Training the Best Undergraduate Students in the World

Undergraduate education is the key stage for building students' basic theoretical knowledge, and Yao attaches great importance to undergraduate teaching in his work. He taught "Theoretical Computer Science", a basic course for first-year students, which influenced the life path of many students. One of the students benefitted from this course is Wang Jun-Xing. In the class, Yao inspired the students with a computer system problem. When Wang proposed a solution to a problem that had plagued the academic community for 30 years, Yao suggested that he write down the idea (Tsinghua University, 2015a). After several months, Yao assisted Wang submit his article to journals. This was the very first article in English that Wang wrote, which was published in his sophomore year (*ibid*). Yao motivates students to take initiative and inspire their thinking. When inspiration strikes, he further encourages students to enjoy and experience the joy of research.

A student survey on Yao's "Computational Applied Mathematics" class showed that 100% of the students were satisfied with the course; 100% of the students agreed that the class left a deep impression on them (Yang, 2019). Behind these double 100% figures is Yao's tireless dedication. Yao's teaching assistant, Li Chenxing, once said, "There is no textbook assigned for this course, and there are no related exercises books on the market; the content of the course is completely designed by Yao himself, and all the homework and exam questions are also provided by Yao himself, and the questions are changed frequently (*ibid*)."

5.1.2 Yao's Classes for Cultivating Special Talents

Yao established an "Experimental Class of Computer Science", commonly known as "Yao Class" at Tsinghua, with the goal to train elite computer science students who are comparable to, and even more exceptional than the world's leading universities.

Courses delivered in Yao Class are very challenging. Students sometimes may need a whole day to complete a single assignment and sometimes may not even find ideal answers. Haoqiang Fan, an undergraduate student of the 2013 class once pointed out that they were only freshmen or sophomore year students but were assumed to have mastered all the basics, and these courses focused on in-depth analysis and framework (Tsinghua University, 2015a). Many students were quite reluctant at the beginning but gradually realized that they actually managed it and mastered the class. Rediscovering themselves, students were surprised and motivated, greatly stimulating their potential, and many of them even took the initiative to contact their advisors to find a topic and conduct research on it (*ibid*). Yao said, "I hope, instead of pressure, the environment at Tsinghua will allow people to experience and feel the challenges and breakthroughs in the learning and research process, as well as the happiness that comes from it" (*ibid*).

Yao believes that an international atmosphere is required if undergraduate education at Chinese universities is to compare with that of world-class universities. Yao

led his colleagues to redesign the undergraduate computer science curriculum, optimizing and reorganizing the coursework to comprehensively cover the frontier areas of computer science research and highlight its interdisciplinary nature. With Yao's invitation, top scholars such as Turing Award winners have walked into Tsinghua's classrooms to bring students an international experience. Yao Class student Shi Tianlin, who was an exchange student at MIT in 2013, was surprised to find that the teaching and learning methods he experienced in class could be "seamlessly integrated" with the world's top universities (*ibid*).

5.2 *Lin Yifu: Joy of Working with Elite Students*

As a passionate teacher, Lin Yifu has contributed to enhancing elite students' innovation skills in the field of economic theories and has been teaching undergraduate classes for more than 20 years and is committed to teaching and nurturing students (Peking University, 2021).

5.2.1 **Establishing Lin Class to Focus on Nurturing Students**

Lin founded the "Experimental Class of New Structural Economics", commonly known as "Lin Class". Lin led his team in making education plans and designing the curriculum, to ensure its teaching content focuses on foundation knowledge in the field of economics and cultivates students' innovation skills and skills to address challenges of the changing world (Peking University, 2020). The core courses featured specially-designed content and a personalized teaching model with small classes, seminars, and one-on-one Q&A sessions (*ibid*). Students in the experimental class are able to communicate and interact directly with Lin and are greatly inspired and more likely to prevail (Peking University, 2021).

Students in Lin Class enjoy the opportunity to have lunch with Lin once every month. During the luncheons, Lin listens and offers suggestions to students' questions and comments about their academic life, and provides further detailed feedback in writing afterwards (Peking University, 2020). In addition to his classroom instruction and lunches with students, Lin often has long talks with his students, patiently responds to students' questions, advising and revising students' assignments word by word. His students have also gathered all their discussion and exchanges into a book, named *The Gardener's Book (Yuan Ding Ji)* (*ibid*). Lin's teaching methods demonstrate that students learn better in a relaxing and cordial environment.

5.2.2 **Personality Charm**

Students all agree that Lin and his personality are "as high as a mountain". Though it is hard to reach, students are deeply influenced by Lin's personality and charisma and

always look up to him as a role model (Chen, 2017). Lin often tells students that, as intellectuals and knowledge workers in China, students should take responsibility for the progress and advancement of society (Sun, 2017b). One student, Cui Jingyuan, once wrote that Lin's life experience shows that "every era needs a group of ascetics, and doing research is a kind of practice, practicing for the people, the motherland, and the world, and eventually I also chose this path". Lin impacts his students with his charisma and profound learning in every aspect.

Lin has always insisted on unity of knowing as doing. On the night before the Master Teaching Award, Lin was still on campus teaching a class to undergraduate students. Only after the class was over, he ran to the airport and take a late flight. When asked why he did not consider changing the course time, Lin replied, "The Master Teaching Award is an encouragement to me, and if I changed my class time in order to get the award, I would not be qualified to get the award" (Bund Education, 2021). An increasing number of students are influenced by Lin and his personality and follow the belief "knowing as doing".

5.3 *Wen Yumei: Nurturing Students with Heart*

Wen Yumei considers students as her own kids and has devoted herself to teaching for more than 60 years. She has edited many classical teaching materials, dedicated herself to training medical talents, developed an online general education course "Humanities and Medical Sciences, and composed a symphony of medicine and humanities.

5.3.1 *Serving Children for Life*

Wen believes in quality cultivation and teaching with heart. Her teaching philosophy is that teachers are responsible for "lighting the fire in students' hearts" and facilitating students to grow (Feng et al., 2011). She is good at exploring different students' strengths and weaknesses and teaching them accordingly. She creates different learning conditions and guides them in their quest for knowledge. To expand students' horizons, she sponsors them to attend and present at international student conferences. To improve students' English reading and writing skills, she organizes English study clubs and personally leads them to read books in foreign languages (Shanghai Education, 2017).

Wen always makes time for her students and inspires students with her personality and charisma. She encourages students to persevere in their studies and stay curious. In her classes, students not only listen to her exciting lectures and enjoy acquiring profound knowledge from Wen, but also are influenced by the ethics and moral values hidden in the curriculum, because Wen believes and sees classroom as a place to create a positive culture among students. In the Introduction to Medical Microbiology class, she tells a story of germ warfare, the story of Bai Quyen, etc., so

that students can deeply appreciate the patriotism, mission, and national pride (*ibid*). She does all this to encourage students to combine their dreams with the “Chinese Dream” and actively participate in the great cause of national development.

5.3.2 Pioneering Innovative Teaching Methods

Wen has been boldly trying to reform in her teaching practice. She perseveres her teaching to bring the latest cutting-edge knowledge in the field from unique perspectives to students. The course she offers has been one of the most enrolled courses in the university. In order to strengthen foundational medicine courses, she actively engages in teaching reform and was the first to teach the “Introduction to Basic Medicine” course (Zhu et al., 2021). In order to cultivate students’ skills to develop and raise questions, she sets up a prize for the best question and awards the student who asks the best question a signed book, to fully motivate students and improve their understanding and learning.

Wen often says to the teachers in her teaching team, “When teachers stand on the podium to face the eyes of students seeking knowledge, we have to keep in mind our responsibility not to mislead them” (Shanghai Education, 2017). Even if it is a class that she teaches every year, she will recreate the handouts and slides to bring the latest knowledge to everyone. Sometimes for a slide, she would take careful attention to revise it repeatedly. Many students have decided to join medical microbiology research and education after taking Wen’s class.

6 Latest Research

6.1 An Overview of Research on Undergraduate Education in China

With the rapid development of undergraduate education in China, increasing research on relevant topics have emerged in academia. Through literature search, this chapter adopts a quantitative analysis to provide an overview of undergraduate education research in China, reviews research fronts, and explores research originality in the past ten years.

To ensure reliability and validity, this study selects core journals in the field of higher education indexed in the databases of “Chinese Social Sciences Citation Index (CSSCI)” (2021–2022) and “the Chinese Core Journal List” (2021 edition) as sampling criteria. Through an advanced search in the higher education journals indexed in these two databases, this study retrieves 2447 journal papers focusing on undergraduate education and published from January 1, 2012 to December 31, 2021.

This study intends to analyze literature related to “undergraduate education” through a knowledge mapping analysis using CiteSpace, and to explore the research

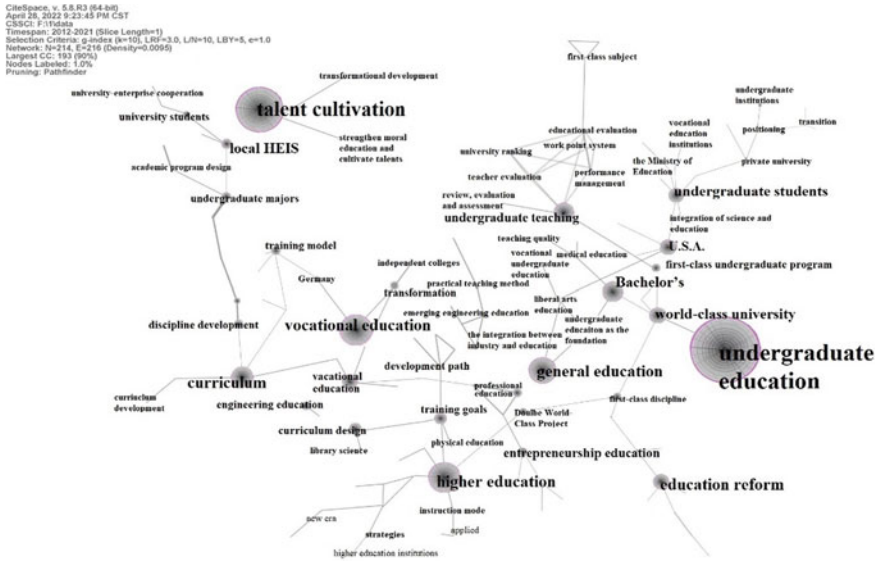


Fig. 8 Clustering view of research on undergraduate education (2012–2021). Source Compiled from search results from CNKI

development and fronts in the field of undergraduate education. After the converted data are imported, the time span from 2012 to 2021 is selected. The analysis process is configured through a few parameters³ to achieve clear visualization results. The visualized knowledge map of keywords is shown in Fig. 8.

In Fig. 8, N = 214 indicates 214 keywords nodes, and E = 216 indicates 216 links between these keyword nodes. The circles in the figure stand for keyword nodes. The larger the circle, the more frequently the keyword occurred. Among them, “undergraduate education” has the largest node, followed by “talent cultivation”, “tertiary vocational education”, “general education”, “higher education”, “bachelor’s”, “teaching reform”, “curriculum”, and “undergraduate teaching”. Keywords are often just a few words and take up relatively little space in the paper, but they are the essence of the paper. Literature can be retrieved through keyword searches, meanwhile keywords can help readers understand the scope and contents of an article. Research themes and focus can be found through analyzing high-frequency keywords (Jiang et al., 2008).

This chapter analyzes the retrieved journal papers from multiple perspectives by using the network summary table function in CiteSpace. The top 15 keywords are identified in terms of frequency, which reflect the research focus on undergraduate education in China (see Table 4). Although the keyword “undergraduate education” has the highest frequency, it does not reflect the detailed research themes and topics in the field of “undergraduate education”. The same is true for the keywords “higher

³ Note The parameter selection panel of the software sets g-index (k = 10).

Table 4 Top 15 frequently used keywords

Keyword	Times used	Keyword	Times used
Talent cultivation	135	entrepreneurship education	27
Tertiary vocational education	103	specialized education training model	24 21
General education	60	training goals	21
Education reform	46	curriculum design	20
Curriculum	44	local HEIs	20
Undergraduate teaching	43	world-class undergraduate program	18
U.S	33		
World-class university	31		

Source Compiled from search results from CNKI

education”, “undergraduate”, and “undergraduate students”. Therefore, these words are not included in the top 15 keywords. The top three ranked keywords are “talent training”, “tertiary vocational education”, and “general education”.

6.2 Research Focus

According to the frequency and the analysis of related literature, the topics of undergraduate education research that are mostly researched on can be identified, including “talent cultivation”, “tertiary vocational education”, “general education”, etc.

6.2.1 Research on Undergraduate Talent Cultivation

Talent cultivation is one of the essential functions of universities, and undergraduate education is the root and foundation of higher education (Chen, 2018b). Through reviewing existing literature, scholars have focused on exploring modes of undergraduate talent cultivation in terms of goals, plans, and approaches.

Maoyuan Pan (2005a), a renowned educator and academic master of higher education research, pointed out that, since higher education is diversified and HEIs are of diversified types, goals for talent cultivation must be diversified. For example, undergraduate education at practical and profession-oriented universities should set up their goals as serving local socio-economic development, meeting skill demands of industries and enterprises, ensuring curriculum content connecting and relevant to real world experience, and enhancing students’ employability (Wu & Huang, 2014), while research universities should focus on training elite undergraduate students with both discipline-specific knowledge and comprehensive abilities (Li, 2012). In terms of student training plans, practical and profession-oriented universities

should ensure their programs are closely connected and relevant to local workforce development needs and specialized industries (Xue & Wang, 2016); while research universities should stress on education and training of top innovative talents, develop specialized disciplines to cultivate students' professional knowledge, expertise, innovative awareness and creativity and to design interdisciplinary courses to train multidisciplinary and comprehensive skill force (Li, 2022).

HEIs with different goals adopt different training approaches towards teaching and learning. University-industry research collaboration and university-enterprise cooperation are essential to train technical talent (Wu & Huang, 2014); while research universities should develop disciplines to support subjects and transform disciplinary advantages to that of talent training (Lu, 2018).

6.2.2 Research on Tertiary Vocational Education

As early as the beginning of the twenty-first century, some scholars intended to categorize tertiary vocational education (Pan, 2005b; Shi & Xu, 2003). With the introduction of a series of policies on vocational education, increasing attention has been placed on tertiary vocational education. Listed in the State Council's, 2019 *National Implementation Plan for Vocational Education Reform* (2019), vocational education was piloted at the undergraduate level as a major reform, which set off a research boom on this topic. In terms of its nature, Wang and Qi (2022) believe that tertiary vocational education is both practice-oriented and technical in nature. The goal of tertiary vocational education is to train technical talents at undergraduate level (Lu, 2019). In terms of training approaches, through analysis on the development, reform models and approaches of vocational education in foreign countries, Liao (2020) explores the reform paths and direction to develop tertiary vocational education from the perspectives of its nature, features, and goals, so as to provide theoretical support to improve the vocational education sector in China.

6.2.3 Research on General Education

Cai Yuanpei, Pan Guangdan, Zhu Guangqian and other famous educators have introduced general education into Chinese universities and put it into practice (Yang, 2000). Research on general education focuses on exploration at the theoretical level and promotion at the practical level. At the theoretical level, Chen (2006) critically reviewed its definition and its differences from professional learning, liberal education, liberal arts education, quality education, specialized education, as well as general elective and commonly required courses; Li and Wang (1999) analyzed the definition and nature of general education; and Liu (2012) proposed that general education carries the basic goal of university education, that is to develop students as a whole person. At the practical level, scholars investigate the opportunities and challenges to develop general education. Su and Li (2018) analyzed the challenges and implications to reform general education at Tsinghua University and discuss

the logical relationship between general education curriculum and its goals in terms of competence; Yu (2016) adopted a case study of China University of Political Science and Law to examine the status quo of general education in the Chinese higher education context and proposes recommendations to further promote such programs.

6.3 Research Originality

Academics play the main role in developing scientific research in China. Research results in the field of education are mainly published in the forms of papers and books (Gong, 2009). A review of the existing research literature on undergraduate education in China in recent years reveals that academics' original research not only enriches related theories but also makes a positive impact on policymaking and practices of undergraduate education in China.

At the theoretical level, Pan Maoyuan has been greatly contributing to rich theoretical discussion of the development of undergraduate education in China, including theories on the essence of higher education, the law of internal and external relations in education, Chinese higher education massification, basic function of HEIs, private higher education, curriculum and instruction in higher education, developmental stages of disciplines in higher education, etc. (Liu & Tang, 2020). Gu Mingyuan also provides rich and forward-looking educational thoughts. The importance of undergraduate education in university education has become a heated topic in recent years; Gu first published the paper titled "Undergraduate education is the foundation of higher education" back in 1990. Lately, he also proposes "the university reform should emphasize on undergraduate teaching, and the best teachers should return to the podium and teach students" (Zhang & Li, 2018). Bie's theoretical research is based on practices and provides theoretical support to undergraduate teaching reform (Zhang, 2011). In the article "Rebuilding undergraduate teaching", he surveys the main problems and challenges and then argues that the reform of undergraduate teaching should start with transforming the concepts of undergraduate education (*ibid*).

Some academics conduct innovative and leading research on educational practices. Liu Xian-Jun of Huazhong University of Science and Technology opens up a new area of institutional research in Chinese higher education, shifting structural research at the theoretical level towards problem-probing and -solving in practices, and conducting in-depth systemic research on higher education governance and management (Zhou, 2017). In relation to research on faculty, recent research focuses on student-centered teaching methodologies and approaches. For example, Zhou and Zhou (2002) employ surveys and classroom observations (recording) to investigate faculty's discourse in terms of discourse quantity, ways to ask questions, interactions, and feedback. From the perspective of student experience, Luo et al.

(2009) use NSSE-China survey tool to compare the performance of Tsinghua University's undergraduate education with its peer institutions in the U.S., for five comparable indicators, educational stages and student attainment. The result shows that Tsinghua's undergraduate teaching quality is largely comparable to its world-class peers in the U.S.

7 Governmental Policies

7.1 General Policies

7.1.1 Educating and Training the Top-Notch Undergraduate Students

Chinese undergraduate education emphasized developing the best students at the beginning of the economic reform in the 1980s. At that time, the University of Science and Technology of China (USTC) established the first Class for the Gifted Young, the first pilot program to train top talented students in basic science disciplines (Ye, 2014). In 2009, in response to the “Qian Xue-Sen's question”—why do Chinese universities lack of elite talents—the government further focuses on educating and training the top talented students.

In 2009, the MOE, in partnership with the Ministry of Organization and the Ministry of Finance, launched the Pilot Program for Training Top Talented Students in Basic Sciences. The pilot program was implemented in the five disciplines of mathematics, physics, chemistry, biology and computer sciences (Tsinghua University, 2015b), which was the very beginning of the “Six Excellence and One Top-Notch” Talent Training Project 1.0.⁴ The pilot program aims to establish a few national bases for training young talent via basic disciplines at top research universities, to build an institutional mechanism to train top students in HEIs, to attract elite students to engage in basic science research, to further transform these selected students into leading scientists in related disciplinary areas, and to eventually become leading scientists in the global stage (Du, 2014). Subsequently, this program was implemented in 17 ministry affiliated universities, including Peking and Tsinghua University (the State Council, 2010).

In 2018, the MOE issued *Guidelines on Accelerating the Development of High-Quality Undergraduate Education and Comprehensively Improving the Capacity of Talent Training* and decided to further implement the “Six Excellence and One

⁴ “Six Excellences” refers to the Outstanding Engineer Education and Training Program, the Outstanding Doctor Education and Training Program, the Outstanding Agriculture and Forestry Talents Education and Training Program, the Outstanding Rule of Law Talents Education and Training Program, the Outstanding News Communication Talents Education and Training Program, and the Outstanding Teacher Training Program. “Top-notch” refers to the Training Program for Top-Notch Students in Basic Disciplines.

Top-Notch” Talent Training Project 2.0.⁵ *Guidelines on the Implementation of the Cultivation Program for Young Talent Students in Basic Disciplines 2.0* issued by the MOE and five other ministries expanded the disciplinary areas by adding astronomy, geography, atmospheric science, marine science, geophysics, geology, psychology, basic medicine, philosophy, economics, Chinese language and literature, history, etc. (MOE et al., 2018b). This program has made significant progress in terms of institutional structure, student selection, and training approaches. It also explores the new talent training approach of “one mentorship system with emphasis on student-centeredness, small class sizes and internationalization”, to achieve “the best undergraduate students and the best undergraduate education programs” (Zhang, 2016).

This program aims to build a talent training system of excellence and develop world-class students with Chinese characteristics. The Talent Training Program 2.0, based on its original 1.0 program, has developed a series of talent training approaches, along with plans and standards that seek to enhance reform quality and effectiveness (MOE, 2018e). This new program has turned the original individual project into a series of plans (MOE, 2019c), from “single armed combat” to “collective forces”. This reflects that Chinese higher education reform and development is shifting its role as a follower towards a leading role in certain fields—a “quality revolution” for Chinese higher education in the new era (MOE, 2019d).

7.1.2 Quality Assurance in the Respect of Undergraduate Teaching

China formally launched undergraduate teaching evaluation in the 1980 and 1990s. *The Provisional Regulations on Educational Evaluation of Regular Higher Education Institutions* announced in the early 1990s marked the formation of the basic framework for quality assurance of undergraduate education in China. In 2002, the MOE issued *(Trail) Plans for Undergraduate Teaching Evaluation at Regular Higher Education Institutions*, which intended to combine pass/fail, merit-based and randomized evaluations into one evaluation system to assess undergraduate teaching quality at Chinese universities. This has led to the standardization and institutionalization of quality assessment of Chinese undergraduate education (Liu & Li, 2018).

In 2011, *Guidelines on Undergraduate Teaching Evaluation at Regular Higher Education Institutions* proposed a “five-in-one” evaluation system. This system is based on HEIs’ self-evaluation; takes institutional evaluation, professional accreditation and appraisal, international evaluation, and performance indicators of teaching quality as its main content; integrates multiple evaluation results from government,

⁵ The “Six Excellences and One Top-Notch” plan 2.0 includes: Outstanding Engineer Education and Training Program 2.0, Outstanding Doctor Education and Training Program 2.0, Outstanding Agriculture and Forestry Talent Education and Training Program 2.0, Outstanding Teacher Training Program 2.0, Outstanding Rule of Law Talent Education and Training Program 2.0, Outstanding Journalism and Communication Talent Education and Training Program 2.0, and Top-Notch Student Training Program for Basic Disciplines 2.0.

HEIs, specialized organization and society; and is corresponding to the modern higher education system with Chinese characteristics (MOE, 2011). In 2012, the system to publish an annual evaluation report on HEIs' performance and quality was established and it requires each regular HEIs to publish its annual "Undergraduate Teaching Quality Report". This report can be seen as a self-evaluation approach, but also serves as important evidence for institutional evaluation on undergraduate teaching (MOE, 2013). Since 2017, the Higher Education Evaluation Center of the MOE developed and released the annual *National Report on the Quality of Undergraduate Education and Teaching at Regular HEIs*, which is the first theme-based report on Chinese undergraduate education quality. The four theme-based quality reports cover undergraduate education, engineering education, newly established undergraduate HEIs, and private undergraduate programs (Sun, 2017a).

7.2 Recent Policy Highlights

7.2.1 Developing World-Class Undergraduate Disciplines

The MOE started its so-called "Double Ten-Thousand" project on promoting world-class undergraduate disciplines in 2019. Its mission includes developing 10,000 world-class undergraduate disciplinary programs at both the national and provincial levels respectively (MOE, 2019e). The top three selected disciplines are business administration (674 undergraduate programs), foreign language and literature (609), and computer sciences (577); while over 400 programs are selected respectively in the design, digital information, and mechanical engineering disciplines. The "Double Ten-Thousand" Project is open to all HEIs and disciplines and is implemented in two stages: MOE will first evaluate those applied programs as "first-class at the national level, and after further evaluation and appraisal by MOE to confirm these programs' first-class status in the nation (*ibid*). To apply for the project, each program needs to meet five requirements: clear developmental goals, standardized management, effective reform, excellent teaching forces, and high-quality training (*ibid*).

7.2.2 Developing World-Class Undergraduate Curriculum

The MOE issued the *Guidelines on the Implementation of World-Class Undergraduate Curriculum*. The objectives to develop world-class undergraduate curriculum include:

- to design world-class and top quality undergraduate curriculum;
- to develop new curriculum development concepts;
- to promote reform and innovation on curriculum design;
- to implement effective and scientific evaluation;
- to provide clear guidelines and regulations on curriculum management;

- to stipulate rules on professors' teaching responsibility, enhancing course quality and raise standard on students' graduation requirement;
- to improve faculty's teaching ability and skills;
- to improve quality-oriented incentives for curriculum development; and
- to diversify teaching content and develop a multi-category curriculum system.

It aims to develop about 10,000 world-class undergraduate courses at the national and provincial levels within three years (MOE, 2019f). World-class curriculum sets students in the center of the course programs, and its content reaches the "golden" standard to ensure the curriculum's breadth, depth and integration of learning.⁶ Selected courses must be developed and improved for at least two semesters or two teaching cycles, with effective teaching and learning outcomes, as well as meet requirements in multiple aspects of teaching concepts, teaching outcomes, feasibility, responsiveness to changes in society, management and organization, evaluation, etc. (*ibid*). In November 2020, the MOE awarded 5,118 courses as the national first-class undergraduate courses, including 1,875 online courses, 728 virtual simulation and experiment courses, 1,463 in person courses, 868 courses of hybrid mode, and 184 internship and practice courses (MOE, 2019b)

7.2.3 Evaluating Undergraduate Teaching

In 2013, the MOE launched the first-round of teaching reviews and evaluation at regular HEIs in China, and the second-round reviews and evaluation began in 2021.

The first-round review and evaluation (2013–2018). The first-round teaching review and evaluation proposed five key questions: are the goals of teaching and learning achieved, does the knowledge and skill development meet the societal needs, what teaching resources and conditions are supported, is quality assurance effective, and are employers satisfied with the graduates (Bie, 2021). As of July 2018, a total of 560 Chinese HEIs have participated in the review and evaluation exercise (*ibid*).

The second-round review and evaluation (2021–2025). The second-round review and evaluation is divided into two major categories in terms of the university type (MOE, 2021b). The first group targets the evaluation exercise at those regular HEIs which aspire to become world-class universities with excellent teaching faculty and platforms for teaching and learning, educate and train top talented students, and serve the skill demand for national strategic development. It focuses on reviewing these selected universities' quality assurance capacity and their initiatives and effectiveness to transform undergraduate education and teaching. The second category of

⁶ It refers to high order, innovation, and challenge. "High-order" refers to the organic integration of knowledge ability and quality, which is to cultivate students' comprehensive ability to solve complex problems and advanced thinking. "Innovation" means that the course content reflects the frontier and the times, the teaching form is advanced and interactive, and the learning results are inquiry and personalized. "Challenge" means that the course has a certain degree of difficulty, need to jump to be able to get it, teacher preparation and students have higher requirements under class.

the review and evaluation exercise targets at three different types of HEIs in terms of goals, mission, and history, that is: regular HEIs focusing on training academic talent, regular HEIs stressing on training technical talent, and local teaching universities. The first two types of HEIs have engaged in the first-round review evaluation, while local teaching universities have a relatively short history and participate in the review and evaluation exercise for the first time. The detailed content covered in the second-round review and evaluation include university goals for teaching and learning, teaching resources, training plans and approaches, students' development and experience, and teaching outcomes. The evaluation procedures cover: application submission, self-evaluation at the institutional level, peer review, feedback, improvement, and supervisory review (*ibid*).

7.2.4 Developing a Quality Culture

Studies on university quality culture are an important element of quality assurance in higher education (Dong & Sun, 2008). In recent years, undergraduate education in China has increasingly placed emphasis on creating a quality culture. *The 40 Guidelines on Higher Education Development in the New Era* issued by MOE (2018a) stipulates that HEIs should improve their self-evaluation system and internal quality assurance system, should build a self-evaluation system on undergraduate teaching and report evaluation result to public, and should promote discipline accreditation. *The Implementation Plans for Undergraduate Teaching Review and Evaluation in regular higher education institutions (2021–2025)*, officially announced in 2021, proposes to develop university quality culture of self-awareness, self-reflection, self-discipline, self-examination and self-correction, and to establish a sound quality assurance system for undergraduate teaching with Chinese characteristics and world standards (MOE, 2021c).

8 Summary

Undergraduate education is at the center of higher education around the world. With global development, undergraduate education in the world continues to move forward. After more than 40 years of reform and opening-up, undergraduate education in China has made great progress with the joint efforts of the government and universities. In recent years, China's undergraduate education is under continuous reform and endeavoring to become world-class, which has been recognized internationally. Dr. Carol Bobby, former chairman of The International Network for Quality Assurance Agencies in Higher Education, points out that the concepts of "school-oriented and student-centered", "classification evaluation and guidance" and the approaches of "data-based monitoring of quality and publishing quality reports" in the Chinese higher education are among the first and advanced internationally, and

Chinese' experience will provide excellent practical examples for quality assurance in large higher education systems (Fan, 2021).

In recent years, China's effort to develop world-class undergraduate education is of significance in terms of its talent cultivation. Developing world-class undergraduate education is a holistic, comprehensive, and complex systematic project. Its quality assurance mechanism helps ensure that China realizes and meets their goals of becoming world-class and achieving and sustain its quality excellence (Lin, 2019). It is believed that, with the effort of the government, HEIs, faculty, and students, undergraduate education in China will progress by leaps and bounds in the near future.

References

- Bie, D. R. (2021). Xinyilun putong gaoxiao benke jiaoyu jiaoxue shenhe pinggu fang'an de tedian tese he liangdian (Characteristics, features, and highlights of the new round audit evaluation of undergraduate education and teaching program in China). *Zhongguo Gaojiao Yanjiu (china Higher Education Research)*, 03, 7–13.
- Bund Education. (2021). Lin Yifu: Jiaoshu shi zui kuaile de shi, buneng gufu le zhege shidai (Lin Yifu: Teaching is the happiest thing, we should live up to the times). Retrieved December 28, 2021 from <https://www.163.com/dy/article/GPCC8T4E0516CMM2.html>.
- Central Committee of the Communist Party of China. (1985). *Guanyu jiaoyu tizhi gaige de jue ding (Decision on the reform of the educational structure)*. Retrieved March 1, 2022 from <http://www.gov.cn/gongbao/shuju/1985/gwyb198515.pdf>.
- Chen, B. S. (2018a). Zai xinshidai quanguo gaodeng xuexiao benke jiaoyu gongzuo huiyishang de jianghua (Speech at the national conference on undergraduate education in colleges and universities in the new era). *Zhongguo Gaodeng Jiaoyu (china Higher Education)*, 23, 4–10.
- Chen, B. S. (2018b). Jianchi yibenweiben tuijin sigehuigui jianshe zhongguo tese shijie shuiping de yiliu benke jiaoyu (Focus on the foundation, promote the “four returns”, and build a first-class undergraduate education with Chinese characteristics and world standards). *Shishi Baogao (current Affairs Report)*, 5, 18–30.
- Chen, X. (2017). Wo yu Lin Yifu–Cui Jingyuan: Shinian yijiao jiaoguo meng (Lin Yifu and me, Jingyuan Cui: A dream—ten years about family and nation). Retrieved December 28, 2021 from <https://www.nse.pku.edu.cn/sylm/xwsd/244858.htm>.
- Chen, X. M. (2006). Dui tongshi jiaoyu youguan gainian de bianxi (An analysis of some concepts about general education). *Gaodeng Jiaoyu Yanjiu (journal of Higher Education)*, 03, 64–68.
- Chen, Y. C., & Huang, F. Q. (2008). Wuli jiaoxue de “tiyanshi xuexi” (“Experiential learning” in physics teaching). *Zhongguo Jiaoyuxue Kan (Journal of the Chinese Society of Education)*, 29(3), 53–55.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 39(7), 3–7.
- China Association of Higher Education. (2019). Woguo shouge putong benke yuanxiao jiaoshi jiaoxue fazhan zhishu yufabu (China's first teacher teaching development index for general undergraduate colleges and universities was pre-released). Retrieved March 6, 2022 from <https://www.cahe.edu.cn/site/content/11952.html>.
- Ding, Y. S., & Zhao, E. N. (2018). Woguo gongcheng jiaoyu mairu quanqiu “diyifangzhen” (Chinese engineering education enters the global top league). Retrieved February 22, 2022 from http://www.moe.gov.cn/jyb_xwfb/s5147/201809/t20180927_350082.html.

- Dong, L. P., & Sun, W. S. (2008). Daxue zhiliang wenhua de benzhi tezheng yu jigou pouxi (An analysis of the essential characteristics and structure of university quality culture). *Dangdai Jiaoyu Kexue (contemporary Educational Sciences)*, 13, 6–9.
- Du, Y. B. (2014). Tansuo bajian chuangxin rencai peiyang xinji zhi (Exploring a new mechanism for the training of top-notch innovative talents). *Zhongguo Gaodeng Jiaoyu (china Higher Education)*, 50(2), 4–6.
- Eurostat. (2020). Tertiary education statistics. Retrieved March 6, 2022 from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Tertiary_education_statistics#Fields_of_education.
- Ewell, P. T., & Jones, D. P. (1996). *Indicators of “good practice” in undergraduate education: A handbook for development and implementation*. Boulder: National Center for Higher Education Management Systems.
- Fan, W. (2021). Gaodeng jiaoyu pinggu fazhanshi (History of higher education assessment). Retrieved March 7, 2022 from https://epaper.gmw.cn/gmrb/html/2021-02/08/nw.D110000gmrB_20210208_2-09.htm.
- Fan, W., Li, Z., & Bie, D. R. (2021). *Quanguo putong gaoxiao benke jiaoyu jiaoxue zhiliang baogao (2020 niandu) (National undergraduate education and teaching quality report [2020])*. Higher Education Press.
- Fan, W., & Wu, D. G. (2019). *Zhongguo gaodeng xuexiao benke jiaoyu zhiliang baogao (2013–2018 nian) (Report on the quality of undergraduate education in Chinese universities [2013–2018])*. Social Sciences Academic Press.
- Feng, X. M., Li, X. H., & Ye, J. (2011). *Xinyang de lilian. (The power of faith)*. Shanghai: Shanghai Education Press.
- Gong, F. (2009). Zhongguo jiaoyu yanjiu lingyu xuezhe, lunzhe yingxiangli baogao: Jiyu 2005–2006 nian CSSCI de tongji fenxi (Report on the influence of scholars and works in China’s educational research field: Based on the 2005–06 statistical analysis of CSSCI). *Fudan Jiaoyu Luntan (fudan Education Forum)*, 02, 35–45.
- Huang, F. T. (2017). Shenme shi shijie yiliu daxue de benke jiaoyu (What is the world-class undergraduate education). *Gaodeng Jiaoyu Yanjiu (journal of Higher Education)*, 08, 1–9.
- Huang, H. J., & Sun, J. H. (2018). Woguo shengyu gaodeng jiaoyu zonghe fazhan shuiping pingjia yanjiu (Evaluation of the comprehensive development level of higher education in China’s provinces). *Dangdai Jiaoyu Kexue (contemporary Educational Sciences)*, 10, 63–68.
- Jiang, C. L., Du, W. B., & Li, J. B. (2008). Jingjixue yanjiu redian lingyu zhishi tupu: Gongci fenxi shijiao (Economy papers map of co-occurrence analysis based on CSSCI). *Qingbao Zazhi (Journal of Intelligence)*, 09, 78–80+157.
- Li, B. Q. (2022). Hangye tese gaoxiao bajian chuangxin rencai peiyang yanjiu: Jiyu Nanjing xinxi gongcheng daxue de tansuo (Research on the training of top innovative talents in universities with industry characteristics: Based on the research of Nanjing University of Information Science and Technology). *Jiangsu Gaojiao (jiangsu Higher Education)*, 04, 52–56.
- Li, H. H. (2012). Woguo yanjiuxing daxue benke jiaoyu peiyang mubiao dingwei yanjiu: Jiyu “985” gaoxiao 2010 niandu “benke jiaoxue zhiliang baogao” de wenben fenxi (Research on the orientation of the cultivation objectives of undergraduate education in research universities: Based on the text analysis of the undergraduate teaching quality report of Project 985 universities in 2010). *Guojia Jiaoyu Xingzheng Xueyuan Xuebao (Journal of National Academy of Education Administration)*, 05, 72–77.
- Li, H. X. (1997). *Minguo jiaoyu shi (History of education in the Republic of China)*. Shanghai Education Press.
- Li, M. L., & Wang, Y. Q. (1999). Guanyu “tongshi jiaoyu” gainian neihan de taolun (Discussion on the connotation of the concept of “general education”). *Qinghua Daxue Jiaoyu Yanjiu (Tsinghua Journal of Education)*, 01, 99–104.
- Li, Y. H. (2018). Jiaoyubu gaojiaosi sizhang Wu Yan: Zhongguo kaishi chengwei quanqiu gongcheng jiaoyu de “lingpaozhe” (Yan Wu, Director of the Department of Higher Education, Ministry of

- Education: China has begun to become a “leader” in global engineering education). Retrieved March 6, 2022 from <http://edu.people.com.cn/n1/2018/11/14/c367001-30400565.html>.
- Liao, L. (2020). Benke cengci zhiye jiaoyu gaige: Xianhuang, lujing yu fangxiang (Reform of tertiary vocational education: Current situation, path, and direction). *Zhongguo Zhiye Jiaoyu (Chinese Vocational and Technical Education)*, 25, 24–29.
- Lin, J. (2019). Yiliu benke jiaoyu: Jianshe yuanze, jianshe zhongdian he baozhang jizhi (World-class undergraduate education: Development principles, keys, and guarantee mechanism). *Qinghua Daxue Jiaoyu Yanjiu (Tsinghua Journal of Education)*, 40(2), 1–10.
- Liu, H., & Tang, X. M. (2020). Xinzhongguo jiaoyuxue bentuhua licheng ju yao: Cong Wu Jie de xuanyan dao Pan Maoyuan de goujian (An outline of the localization process of pedagogy in new China: From Jie Wu to Maoyuan Pan). *Daxue Jiaoyu Kexue (University Education Science)*, 04, 23–30.
- Liu, L., & Li, J. (2018). Woguo gaodeng jiaoyu zhiliang baozhang zhengce bianqian yanjiu: Jiyu 1985–2016 nian de zhengce wenben (A study on the changes of quality assurance policies for higher education in China: Based on the policy texts from 1985 to 2016). *Suzhou Daxue Xuebao (Jiaoyu Kexue Ban) (Journal of Soochow University [Educational Science Edition])*, 02, 24–32.
- Liu, T. F. (2012). Daxue tongshi jiaoyu de yiyun jiqi kenengxing (The implication and practicability of general education in universities). *Gaodeng Jiaoyu Yanjiu (Journal of Higher Education)*, 07, 1–5.
- Lu, G. D. (2018). Zhili “shuikue” dazao “jinke” (Reforming unsatisfactory lessons and creating “golden lessons”). *Zhongguo Daxue Jiaoxue (China University Teaching)*, 09, 23–25.
- Lu, S. J. (2019). Shixing benke cengci zhiye jiaoyu shi wanshan woguo zhiye jiaoyu zhidu tixi de zhongyao jucuo (The trial implementation of tertiary vocational education is an important action in improving the system of vocational education in China). *Jiaoyu Fazhan Yanjiu (Research in Educational Development)*, 07, 35–41.
- Luo, Y., Shi, J. H., & Tu, D. B. (2009). Qinghua daxue benke jiaoyu xueqing diaocha baogao 2009: Yu meiguo dingjian yanjiuxing daxue de bijiao (Annual report of Tsinghua college education survey 2009: Comparing with American top research universities). *Qinghua Daxue Jiaoyu Yanjiu (Tsinghua Journal of Education)*, 05, 1–13.
- Ma, J. X. (1983). “Chang” fei ji: Dui woguo xuezhi de yidian kanfa (“Long” is not the solution: Opinions on China’s educational system). *Waiguo Jiaoyu Ziliao (Global Education)*, 06, 35–41.
- Ma, L. T. (2016). “Shuangyiliu” jianshe buneng qeshi benke jiaoyu (The development of the Double World-Class Project cannot lack undergraduate education). *Zhongguo Daxue Jiaoxue (China University Teaching)*, 05, 9–14+26.
- Ministry of Education. (1998). *Mianxiang 21 shiji jiaoyu zhenxing xingdong jihua (Action plan for education revitalization in the 21st century)*. Retrieved April 15, 2022 from <http://old.moe.gov.cn/publicfiles/business/htmlfiles/moe/s6986/200407/2487.html>.
- Ministry of Education. (2011). *Guanyu putong gaodeng xuexiao benke jiaoxue pinggu gongzuo de yijian (Guidelines on undergraduate teaching evaluation at regular higher education institutions)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/201802/t20180208_327120.html.
- Ministry of Education. (2013). *Guanyu putong gaodeng xuexiao bianzhi fabu 2012 nian “benke jiaoxue zhiliang baogao” de tongzhi (Notice on the preparation and release of the 2012 “undergraduate teaching quality report” of regular higher education institutions)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7981/201310/t20131018_166966.html.
- Ministry of Education. (2016). *Educational statistics yearbook of China 2015*. China Statistics Press.
- Ministry of Education. (2017). *Educational statistics yearbook of China 2016*. China Statistics Press.
- Ministry of Education. (2018a). *Guanyu jiakuai jianshe gaoshuiping benke jiaoyu quanmian tigao rencai peiyang nengli de yijian (Guidelines on accelerating the development of high-quality undergraduate education and comprehensively improving the capacity of talent training)*.

- Retrieved March 1, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/201810/t20181017_351887.html.
- Ministry of Education. (2018b). *Yiliu benke jiaoyu xuanyan (Chengdu xuanyan) (World-class undergraduate education statement [Chengdu statement])*. Retrieved March 1, 2022 from http://www.moe.gov.cn/jyb_xwfb/xw_fbh/moe_2069/xwfbh_2018n/xwfb_20180622/sfcl/201806/t20180622_340649.html.
- Ministry of Education. (2018c). Woguo jinqian zhuan ye jinru quanqiu gongcheng jiaoyu “diyifangzhen” (Nearly 1,000 majors in China have entered the first class of engineering education in the world). Retrieved March 6, 2022 from http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/201806/t20180612_339209.html.
- Ministry of Education. (2018d). *Educational statistics yearbook of China 2017*. China Statistics Press.
- Ministry of Education. (2018e). Jiaoyubu gaodengjiaoyusi fuzeren jiu guanyu jiakuai jianshe gaoshuiping benke jiaoyu quanmian tigao rencai peiyang nengli de yijian deng wenjian da jizhe wen (Director of the Department of Higher Education of Ministry of Education answers reports’ questions on policy documents including guidelines on accelerating the development of high-quality undergraduate education and comprehensively improving the capacity of talent training). Retrieved March 7, 2022 from http://www.moe.gov.cn/jyb_xwfb/s271/201810/t20181017_351821.html.
- Ministry of Education. (2019a). *Educational statistics yearbook of China 2018*. China Statistics Press.
- Ministry of Education. (2019b). Shoujie jiaoxue dashi jiang jianjie (Introduction to the first Distinguished Master Teachers award). Retrieved February 25, 2022 from http://www.moe.gov.cn/jyb_xwfb/xw_fbh/moe_2606/2019/tqh20191031/sfcl/201910/t20191031_406251.html.
- Ministry of Education. (2019c). Jieshao “liuzhuoyue yibajian” jihua 2.0 youguan qingkuang (Introduction of the “Six Excellence and One Top-Notch” Talent Training Project 2.0). Retrieved March 7, 2022 from http://www.moe.gov.cn/fbh/live/2019/50601/twwd/201904/t20190429_380086.html.
- Ministry of Education. (2019d). “Liuzhuoyue yibajian” jihua 2.0 qidong dahui zhakaikai: Xianqigaojiao zhiliang geming zhuli dazao zhiliang zhongguo (“Six Excellences and One Top-Notch” Talent Training Project 2.0 Kick-off Conference was held to start a “quality revolution” for Chinese higher education). Retrieved March 7, 2022 from http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/moe_1485/201904/t20190429_380009.html.
- Ministry of Education. (2019e). *Guanyu shishi yiliu benke zhuan ye jianshe “shuangwan jihua” de tongzhi (Notice on the implementation of the “Double Ten-Thousand” project for the development of world-class undergraduate disciplines)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/201904/t20190409_377216.html.
- Ministry of Education. (2019f). *Guanyu yiliu benke kecheng jianshe de shishi yijian (Guidelines on the implementation of world-class undergraduate curriculum)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/201910/t20191031_406269.html.
- Ministry of Education. (2020a). *Educational statistics yearbook of China 2019*. China Statistics Press.
- Ministry of Education. (2020b). *Guanyu gongbu shoupi guojiaji yiliu benke kecheng rending jieguo de tongzhi (Notice on the announcement of the results of the first batch of national first-class undergraduate courses)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/202011/t20201130_502502.html.
- Ministry of Education. (2021a). 2020 Nian gejigelei xuexiao xiaoshu, jiaozhigong, zhuanren jiaoshi qingkuang (The number of schools, educational personnel, and full-time teachers by type and level in 2020). Retrieved March 6, 2022 from http://www.moe.gov.cn/jyb_sjzl/moe_560/2020/quanguo/202108/t20210831_556365.html.
- Ministry of Education. (2021b). Linian tongguo gongcheng jiaoyu renzheng de putong gaodeng xuexiao benke zhuan ye mingdan (List of undergraduate majors in regular higher education institutions that have passed the engineering education certification over the years). Retrieved

- March 6, 2022 from <http://www.moe.gov.cn/s78/A08/tongzhi/202106/W020210623304800029548.pdf>.
- Ministry of Education. (2021c). *Putong gaodeng xuexiao benke jiaoyu jiaoxue shenhe pinggu shishi fang'an (2021–2025 nian) (The Implementation plans for undergraduate teaching review and evaluation in regular higher education institutions [2021–2025])*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A11/s7057/202102/t20210205_512709.html.
- Ministry of Education. (2022). 2021 Nian quanguo jiaoyu shiye fazhan tongji gongbao (The 2021 statistical bulletin on national education development). Retrieved September 15, 2022 from http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202209/t20220914_660850.html.
- Ministry of Education, Ministry of Finance, & National Development and Reform Commission. (2018a). *Guanyu gaodeng xuexiao jiakuai “shuangyiliu” jianshe de zhidao yijian (Guidelines on accelerating the development of the Double World-Class Project)*. Retrieved March 1, 2022 from http://www.moe.gov.cn/srcsite/A22/moe_843/201808/t20180823_345987.html.
- Ministry of Education, et al. (2018b). *Jiaoyubu deng liubumen guanyu shishi jichu xueke bajian xuesheng peiyang jihua 2.0 de yijian (Guidelines of Ministry of Education and other five governmental organizations on the implementation of the cultivation program for young talent students in basic disciplines 2.0)*. Retrieved March 7, 2022 from http://www.moe.gov.cn/srcsite/A08/s7056/201810/t20181017_351895.html.
- Nanjing University. (2021). *Nanjing daxue 2020–2021 xuenian benke jiaoxue zhiliang baogao (Undergraduate teaching quality report of Nanjing University in 2020–2021 academic year)*. Retrieved March 6, 2022 from <https://xxgk.nju.edu.cn/15434/list.htm>.
- National Bureau of Statistics. (2021). *China statistical yearbook 2020*. China Statistics Press.
- National Education Commission. (1993). *Jiakuai gaige he jiji fazhan gaodeng jiaoyu: 1992 nian quanguo putong gaodeng jiaoyu gongzuo huiyi wenjian huibian (Accelerating the reform and development of higher education: Compilation of the documents of the 1992 National Regular Higher Education Work Conference)*. Ordnance Industry Press.
- National Institute of Education Sciences. (1984). *Zhonghua renmin gongheguo jiaoyu dashiji 1949–1982 (Educational events of the People's Republic of China 1949–1982)*. Education Science Press.
- OECD. (2018). Dataset: Graduates by field. Retrieved March 6, 2022 from <https://stats.oecd.org/>.
- OECD. (2021). Historical population. Retrieved March 6, 2022 from <https://stats.oecd.org/Index.aspx?DataSetCode=HISTPOP>.
- Pan, M. Y. (2005a). Zhongguo gaodeng jiaoyu de dingwei, tese he zhiliang (The orientation, characteristics, and quality of Chinese higher education). *Zhongguo Daxue Jiaoxue (China University Teaching)*, 12, 4–6.
- Pan, M. Y. (2005b). Jianli gaodeng zhiye jiaoyu duli tixi chuyi (Discussion on establishing an independent system of tertiary vocational education). *Jiaoyu Yanjiu (Educational Research)*, 05, 26–29.
- Peking University. (2020). Beijing daxue xinjieguo jingjixue shiyanban zhaosheng shouce (Brochure of “experimental class of New Structural Economics” of Peking University). Retrieved December 28, 2021 from <https://www.nse.pku.edu.cn/docs/20210421145843118525.pdf>.
- Peking University. (2021). Lin Yifu jiaoshou ronghuo 2021 niandu “jiaoxue dashi jiang” (Professor Lin Yifu received the 2021 Distinguished Master Teachers award). Retrieved April 25, 2022 from <https://www.nse.pku.edu.cn/sylm/xwsd/517167.htm>.
- Qu, S. P. (1993). *Zhongguo daxue jiaoyu fazhan shi (History of Chinese higher education)*. Shanxi Education Press.
- Qu, T., & Wang, X.H. (2015). Guanyu woguo benke jiaoyu de ruogan sikao: Lishi, shuxing yu nengli (Reflections on China's undergraduate education: History, attributes, and capacities). *Chongqing Dier Shifan Xueyuan Xuebao (Journal of Chongqing University of Education)*, 2, 118–123+176.

- Shanghai Education. (2017). Fudan daxue Wen Yumei tongzhi xianjin shiji (Advanced deeds of Wen Yumei of Fudan University). Retrieved December 30, 2021 from http://edu.sh.gov.cn/web/hdpt/hero_detail.html?id=95.
- Shen, Y. Q., Liu, J. A., Zhang, J. L., & Xu, X. M. (2021). Benke xueshuxing bajian rencai peiyang guocheng yaosu ji zuoyong jili (Study on the elements and mechanisms of the training of undergraduate top-notch students). *Gaodeng Gongcheng Jiaoyu Yanjiu (Research in Higher Education of Engineering)*, 41(5), 106–112.
- Shi, L. (2018). Balao gaodeng jiaoyu de “chukou” (Manage the strict graduation assessment of higher education). Retrieved March 1, 2022 from <http://opinion.people.com.cn/n1/2018/1029/c1003-30367336.html>.
- Shi, M. Z. (2021). Yiliu benke jiaoyu de jianshe lilu: Nanyang ligong daxue de qishi (The development of world-class undergraduate education: Enlightenment from Nanyang Technological University). *Hebei Shifan Daxue Xuebao (Jiaoyu Kexue Ban) (Journal of Hebei Normal University [Educational Science Edition])*, 23(5), 122–129.
- Shi, W. P., & Xu, G. Q. (2003). Shilun woguo jishu benke de fazhan (Discussion on the development of technical undergraduate education in China). *Zhiye Jishu Jiaoyu (Vocational and Technical Education)*, 31, 5–9.
- Su, P., & Li, M. L. (2018). Jiyu OBE linian, goujian tongshi jiaoyu kecheng jiaoxue yu pinggu tixi: Yi qinghua daxue weili (The development of curriculum and teaching of general education in Tsinghua case: An approach of outcome-based education). *Gaodeng Gongcheng Jiaoyu Yanjiu (Research in Higher Education of Engineering)*, 02, 129–135.
- Sun, J. (2017a). Zuixin ban gaodeng jiaoyu zhiliang “guojia baogao” chulu (The latest edition of the “national report” on the quality of higher education was released). Retrieved March 7, 2022 from <https://news.sciencenet.cn/htmlnews/2017/10/391112.shtml>.
- Sun, X. F. (2017b). Wo yu Lin Yifu: Sun Xifang, shien rushan (Lin Yifu and me, Xifang Sun: My gratitude). Retrieved December 28, 2022 from <http://news.jstv.com/a/20170526/1495793681280.shtml>.
- The State Council. (2010). *Guanyu kaizhan guojia jiaoyu tizhi gaige shidian de tongzhi (Notice on carrying out the pilot reform of the national education system)*. Retrieved March 7, 2022 from http://www.gov.cn/zwqk/2011-01/12/content_1783332.htm.
- The State Council. (2019). *Guowuyuan guanyu yinfa guojia zhiye jiaoyu gaige shishi fang'an de tongzhi (Notice of the State Council on printing and distributing the national implementation plan for vocational education reform)*. Retrieved March 7, 2022 from http://www.gov.cn/zhe ngce/content/2019-02/13/content_5365341.htm.
- Tsinghua University. (2015a). Yao Qizhi yu “yaoban” shinian (Ten years of Yao Chichih and Yao’s class). Retrieved March 25, 2022 from <https://cqi.tsinghua.edu.cn/show-4732-1.html>.
- Tsinghua University. (2015b). *Jichu xueke bajian xuesheng peiyang shiyan jihua shishi banfa (Implementation measures of the pilot program for the training of top students in basic disciplines)*. Retrieved March 7, 2022 from <https://www.xtjh.tsinghua.edu.cn/info/1019/1090.htm>.
- Tsinghua University. (2018). Yizu shuzi quanmian liaojie qinghua X-Lab (Understand Tsinghua X-Lab through figures). Retrieved March 6, 2022 from https://www.sohu.com/a/233189457_641792.
- Tsinghua University. (2020). Qinghua X-Lab (Tsinghua X-Lab). Retrieved March 6, 2022 from <http://www.x-lab.tsinghua.edu.cn/?c=nurture&a=eir>.
- University of Science and Technology of China. (2022). Shaonianban xueyuan jiaocha xueke ying-caiban peiyang fang'an (Interdisciplinary excellence training program for the Gifted Young Class). Retrieved March 6, 2022 from <http://catalog.ustc.edu.cn/program/s2>.
- Wang, J. X., & Qi, H. X. (2022). Jiyu luoji qidian tanxun benke zhiye jiaoyu de jiben neihan yu shijian lujing: Cong kexue, jishu yu shengchan fazhan de guanxi shijiao (To explore the basic connotation and practical path of undergraduate vocational education based on the logic: From the perspective of the relationship between science, technology, and production). *Zhongguo Zhiye Jishu Jiaoyu (China Vocational and Technical Education)*, 03, 12–17+34.

- Wang, Y. W. (2020). Shen'geng yiliu benke jiaoyu zhong de benkesheng keyan: Jiazhou daxue ouwen fenxiao de qishi (Focusing on undergraduate's scientific research in world-class undergraduate education: Inspiration from the University of California, Irvine). *Chongqing Gaojiao Yanjiu (Chongqing Higher Education Research)*, 8(3), 89–100.
- Weng, W. B. (1999). Chongjian yanjiuxing daxue benke jiaoyu de shizhong duice: Laizi boyierbenke jiaoyu weiyuanhui de jianyi (Ten countermeasures for rebuilding undergraduate education in research universities: Suggestions from the Boyle board of undergraduate education). *Waiguo Jiaoyu Ziliao (Foreign Educational Materials)*, 06, 50–55.
- Wu, Y. (2020). Jiaoyubu: Woguo yi jiancheng shijie guimo zuida gaodeng jiaoyu tixi (Ministry of Education: China has built the world's largest higher education system). Retrieved March 6, 2022 from http://www.moe.gov.cn/fbh/live/2020/52717/mtbd/202012/t20201203_503281.html.
- Wu, Z. J., & Huang, C. L. (2014). Yingyongxing rencai neihan ji yingyongxing benke rencai peiyang (The concept and training of applied talents). *Gaodeng Gongcheng Jiaoyu Yanjiu (Research in Higher Education of Engineering)*, 02, 66–70.
- Wuhan University. (2019). *Wuhan daxue 2018–2019 xuenian benke jiaoxue zhiliang baogao (Undergraduate teaching quality report of Wuhan University in 2018–2019 academic year)*. Retrieved March 6, 2022 from <http://info.whu.edu.cn/info/3335/5951.htm>.
- Xue, Y. X., & Wang, Z. R. (2016). Difang gaoxiao yingyongxing rencai peiyang tese yanjiu (Research on the characteristics of applied talent training in local universities). *Gaodeng Gongcheng Jiaoyu Yanjiu (Research in Higher Education of Engineering)*, 01, 149–153.
- Yan, D. D. (2012). Guanyu “miaoshuxing” jiaoxue pingjia de shijian yu sikao (Practice and reflection on “descriptive” teaching evaluation). *Jiaoxue Yu Guanli (Journal of Teaching and Management)*, 29(7), 40–41.
- Yang, D. (2021). Pujihua jieduan de yiliu benke jiaoyu: Jiben tezheng yu shijian lujing (World-class undergraduate education in popularization stage: Basic characteristics and practical paths). *Xiandai Jiaoyu Guanli (Modern Education Management)*, 10, 54–62.
- Yang, D. P. (2000). *Daxue de jingshen (The spirit of university)*. Liaohai Press.
- Yang, Y. (2019). Yao Qizhi xiansheng de ketang: Yongxin peiyang shijieshang zuihao de benkesheng (Mr. Yao Chichih's class: Training the world's best undergraduates with heart and soul). Retrieved March 25, 2022 from <https://iis.tsinghua.edu.cn/show-7993-1.html>.
- Yang, Z. J. (2004). Zhongguo benke jiaoyu peiyang mubiao yanjiu (zhisi): Zhongguo benke jiaoyu peiyang mubiao de lishi yanjin (1962–1998) (Research on the training objectives of undergraduate education in China [part 4]: The historical evolution of the training objectives of undergraduate education in China [1962–1998]). *Liaoning Jiaoyu Yanjiu (Modern Education Management)*, 08, 1–9+97.
- Ye, J. F. (2014). Cong “shaonianban” “jidiban” dao “bajian jihua” de shishi: 35 nian lai woguo jichu xueke bajian rencai peiyang de huisu yu qianzhan (Retrospect and prospect: Thirty-five years' exploration and practice of academic talent training). *Zhongguo Gaojiao Yanjiu (China Higher Education Research)*, 04, 13–19.
- Ye, Q. L., Zhai, Y. C., & Yue, Z. X. (2020). Chongsu yiliu benke jiaoyu rencai peiyang moshi (Reshaping the talent training mode of world-class undergraduate education). *Zhongguo Gaoxiao Keji (China University Science and Technology)*, 34(7), 52–56.
- Yu, Z. G. (2016). Tuidong daxue tongshi jiaoyu kecheng tixi de peiyu yu wanshan (Promoting the development and improvement of general education curriculum system in universities). *Zhongguo Gaodeng Jiaoyu (China Higher Education)*, 11, 37–40.
- Zhang, D. L. (2016). Chuangjian juyou zhongguo tese shijie shuiping de yiliu benke jiaoyu (Building the first-class undergraduate education with Chinese characteristics and world standards). *Zhongguo Gaojiao Yanjiu (China Higher Education Research)*, 06, 1–4.
- Zhang, L. R. (2011). Gaodeng jiaoyu wenti de “zhongguoshi” sikao lujing: Du Bie Dunrong jiaoshou de gaodeng jiaoyu guanli yu pinggu (A “Chinese-style” study of China's higher education: A review of higher education management and evaluation by Professor Bie Dunrong). *Gaoxiao Jiaoyu Guanli (Journal of Higher Education Management)*, 04, 88–92.

- Zhang, N. X., Wang, S., & Sun, J. H. (2014). Woguo gaodeng jiaoyu zonghe fazhan shuiping pingjia ji quyu chayi yanjiu (An evaluation and regional comparison of the holistic development of Chinese higher education). *Jiaoyu Yanjiu (Educational Research)*, 05, 28–36.
- Zhang, Y. Q. (2019). Cong zhengce dao xingdong: Jianshe yiliu benke jiaoyu xuyao miandui de guanjianxing wenti (From policy to action: The key issues in the development of world-class undergraduate education). *Jiangsu Gaojiao (Jiangsu Higher Education)*, 9, 1–7.
- Zhang, Y. Q., & Li, J. (2018). Shilun Gu Mingyuan de gaodeng jiaoyu sixiang (Discussion on Mingyuan Gu's opinions on higher education). *Jiaoyu Xuebao (Journal of Educational Studies)*, 06, 3–11.
- Zhou, G. L. (2019). Yiliu benke jiaoyu de zhongguo luoji: Jiyu C9 gaoxiao “shuangyiliu” jianshe fang'an de wenben fenxi (China's logic of world-class undergraduate education development: Based on a text analysis of “double world-class” development plan in C9 universities). *Hunan Shifan Daxue Jiaoyu Kexue Xuebao (Journal of Educational Science of Hunan Normal University)*, 2, 15–22.
- Zhou, J. (2017). Tidaowudao jiaodao: “daxue zhidao: Liu Xianjun jiaoyu luncong” shuping (The way of university: A review of “Xianjun Liu's educational discussion”). *Gaodeng Jiaoyu Yanjiu (Journal of Higher Education)*, 06, 105–109.
- Zhou, X., & Zhou, Y. (2002). Daxue yingyu ketang jiaoshi huayu de diaocha yu fenxi (Investigation and analysis of teachers' discourse in college English language class). *Waiyu Jiaoxue Yu Yanjiu (Foreign Language Teaching and Research)*, 01, 59–68.
- Zhu, J. S., & Yao, Q. H. (1993). *Gaodeng jiaoyu cidian (Dictionary of higher education)*. Hubei Education Press.
- Zhu, N. H., Gao, X., Wu, S. L., & Qian, Y. B. (2021). *Buxingzhe: Wen Yumei zhuan (Walkers: A biography of Yumei Wen)*. Science and Technology Press.

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