Journal of Education and Culture Studies
ISSN 2573-0401 (Print) ISSN 2573-041X (Online)
Vol. 5, No. 6, 2021
www.scholink.org/ojs/index.php/jecs

Original Paper

Implications of Modern Germany's Educational Streaming for China's General-vocational Streaming in an Ageing Society

Duan Chaoming[1]

[1] Henan University, Kaifeng, Henan 475000, China

Received: December 8, 2021 Accepted: December 19, 2021 Online Published: December 24, 2021

doi:10.22158/jecs.v5n6p81 URL: http://dx.doi.org/10.22158/jecs.v5n6p81

Abstract

China, which is at an important stage of economic transformation, is facing the double pressure of an aging population and a shortage of skilled workers. The vocational education system in China today cannot meet the development needs of the national economy. Germany's successful experience of general-vocational streaming has some significance for the current unbalanced talent structure in China. At the same time, in the process of implementing education streaming, we should also pay attention to the generation of students' self-identity and help them complete their career planning; vocational schools themselves should promote the quality of teaching, improve the vocational education system and school-enterprise cooperation system to fill the talent needs of China's economic development in the new era. The vocational schools themselves need to improve the quality of teaching and consummate the vocational education system and school-enterprise cooperation system, so as to fill the talent needs of China's economic development in the new era.

Keywords

Educational streaming, Vocational education, German education system

1. Introduction

With the continuous reform and opening up of China, China's economy has made great achievements in the first two decades of the 21st century. Nowadays, China's economic development has also entered a new stage, and changes in the demographic structure and talent structure are important internal influencing factors for China's economic development. Currently China is now approaching a deeply aging society since it stepped into the aging society in 2002. This also means that the quantity and cost advantage of China's age-appropriate labor force is gradually weakening, and China will experience a labor shortage in the next 10 to 20 years. At this stage, due to the continuous development of new technologies, the technological threshold in various factors of production is rising and the intelligence

and refinement of the production process is increasing, the structure of the demand for Chinese labor force is also changing. In the first-level talent market, there is already a “labor shortage” of senior technical personnel, which indicates that the Chinese labor market has changed from a large demand for manual laborers to a demand for senior technical application personnel. However, most of the traditional families are still adhering to the concept of “only when you get into a good university will you be successful” in educating their children, which will further reduce the number of skilled front-line workers, aggravate the imbalance of talent structure, and increase the labor cost of China’s basic industries. In this context, on March 23, 2021, the General Office of the Ministry of Education issued a notice on the enrollment of secondary vocational schools in 2021, putting forward the requirement that “the enrollment of high schools in 2021 insists on a roughly equal ratio between vocational high schools and general high schools”, and the reform of general high schools and vocational high schools is being carried out one after another across the country, and now the reform of general high schools and vocational high schools has started. Germany, as an old industrial power, was able to rise rapidly to become the world’s top industrial power in the post-war decades despite the dismantling of its domestic industries after World War II, which is inseparable from the streaming of its higher education and vocational education. The successful experience of German educational streaming is therefore worth learning from the current reform of vocational education in China.

2. The Dilemma Facing Vocational Education in China

At present, the quality of vocational education in China still needs to be improved. In August 2020, a research group of China Academy of Educational Sciences released the “National Secondary Vocational Education Satisfaction Assessment Report”, which concluded that: China’s modern secondary vocational education system has not yet been formed, and the quality and effective supply capacity of secondary vocational education are not yet well adapted to the objective requirements of high-quality economic and social development and the urgent demand for technical skill talents for industrial transformation and upgrading. It is mainly reflected in four aspects, such as school-enterprise cooperation, teachers’ professional development, social expectation and unbalanced regional development (Note 1).

This article was conceived after 10 years of assisting automotive repair training companies in Henan and parts of Northeast China. Taking the automotive aftertreatment industry as an example, the talent market in central and eastern Henan has low expectations for auto repair graduates from secondary vocational schools. Some employers say that although vocational school graduates have certain basic theoretical knowledge, their knowledge system is obsolete and cannot be connected with market demand, so there is little difference between secondary vocational school graduates and non-basic apprentices in terms of salary and remuneration.

Vehicles meeting China’s Stage III motor vehicle pollutant emission standards (“National III”) were introduced to the market in 2008, The Chinese government has mandated that all of these cars be

scrapped by 2021 at the latest. The current mainstream models in China are “National V” and “National VI” national emission standard vehicles. In such a rapidly changing market, nearly 70% of front-line auto mechanics have not yet mastered the maintenance methods of National V and National VI models, and textbooks and teachers in vocational and technical schools are having a hard time keeping up with the pace of the market. In terms of family cars, electric cars have gradually occupied the market, but the teaching aids for family cars in a middle school in central Henan are still the Santana of 10 years ago, which positively reflects the disconnect between school education philosophy and educational knowledge and the market. From the market point of view, the current auto after-treatment practitioners are mainly after 70 and 80, except for some large auto service stations, most of the new practitioners are still mainly apprentices, and there is a greater demand for skilled workers. Therefore, we have to admit that the development of technology and the upgrading of industry are forcing the quality and quantity of vocational education to be more and better developed. The purpose of vocational education is for economic development and the overall development of individuals. Despite the Ministry of Education’s regulations on the ratio of general education graduates to vocational education graduates, the future development of vocational education still needs to learn from the experience of its predecessors and overcome the current problems in order to truly realize the intrinsic and instrumental value of vocational education.

3. Research Implications

In terms of demographics and economic development, China’s economy has experienced decades of rapid development since the reform and opening up, and its form of economic growth and demographics have many similarities to Japan from the 1960s to the 1990s: the central government provided large amounts of credit resources to large enterprises that held national resources, and effectively used the country’s abundant labor force demographic dividend to produce civilian products for export to Europe and the United States, and eventually in the In the process of exporting goods over a long period of time, a relatively well-developed industrial system was gradually built up. According to the latest census data released by the National Bureau of Statistics, China will most likely enter The Depth Aging of the Population Society in the next 1-3 years. By analogy with the demographic structure of China and Japan, it can be inferred that China’s economic pattern is similar to that of Japan 25 years ago. Before the population aging, thanks to the demographic dividend, the economy grew at a high rate of more than 10% GDP growth in nominal dollars, but after the population aging comes, the nominal GDP growth rate will drop to less than 10%, especially after the deep aging, the nominal GDP will drop 5%, according to the Japanese experience, it is difficult to maintain the real economic growth rate above 5%. has been maintained at around 6%-7%. Since China has implemented the one-child policy for a long time, and although the three-child policy has now been opened up, the natural growth rate of China’s population has been on a downward trend as the pressure of life continues to increase, the future labor shortages in China is only likely to be more serious than in Japan without timely policy

guidance. If China enters into The Depth Aging of the Population Society and the domestic industry type has not completed the transformation, China will encounter a more serious problem than Japan. Therefore, the labor-intensive industries are no longer able to support the future development of China's economy, and a new industrial structure oriented to high-tech industries is the new driving force of China's future economic growth. What the new high-tech industry needs is not only a large number of excellent management personnel, but also the fundamental cornerstone of its development is the skilled workers with modern professionalism, which is a great test for China's current vocational education.

4. Findings

4.1 The German Education System

The German education system can be divided into five stages: elementarbereich (corresponding to the Chinese preschool stage), primarbereich (corresponding to the Chinese primary stage), Sekundarbereich I (corresponding to the Chinese middle school stage), Sekundarbereich II (corresponding to the Chinese high school stage) and tertiärer Bereich (corresponding to the higher education, university level, in China) (Ditton & Reinders, 2011). Sekundarbereich I is divided into four types of schools: liberal arts and science high schools, practical high schools, vocational preparatory schools and mixed high schools, with a time frame of fifth to tenth grade. Gymnasiale Oberstufe (arts and science upper secondary school) and Beruflichule Vollzeitschule (full-time vocational school), with a time period of eleventh to thirteenth grade. In contrast to the two streams of the current junior high school and university entrance examinations in China, the two most important streams of German education occur at two different stages: the "primary school" and the "university entrance examinations".

4.2 "Primary to Secondary" Streams in Germany

German secondary schools are divided into Gymnasiums, Gesamtschule, Realchule and Hauptschule. Of these, only the students in the focus lessons of the Gymnasium and the Gesamtschule are eligible for university entrance, and these students account for less than 60 per cent of the total student population in Germany. The rest of the students are referred to practical secondary schools and vocational preparatory schools, which focus on vocational and technical training and correspond to vocational or technical schools in China. In contrast to Chinese primary schools, the main subjects in German primary schools are not only language and mathematics, but science and other subjects are also treated as core subjects. Only students with good enough grades in the main subjects, above a B grade, can be recommended to a liberal arts secondary school. In addition to grades, individual character traits, personal characteristics and even subject performance can influence school recommendations. From some parents' communication in the German Education Forum, I found that some students were eventually recommended to real science secondary schools due to poor classroom performance, even though they achieved a B grade or above in all their main subjects in the fourth grade assessment, so

classroom performance is as important as grades.

In addition, there is the phenomenon of some parents sending their children to real schools in order to give their children more life experiences, even though they have received a recommendation letter from a liberal arts or science secondary school. However, the majority still choose to stay in the liberal arts secondary schools. Until 2012, the majority of German state based their recommendation on a letter from the primary school, but since 2013, this criterion has been gradually relaxed. As a result, some parents who have received a practical secondary school or vocational preparatory course also choose to send their children to a liberal arts secondary school on a trial basis. However, this does not mean that German primary school graduates can choose a secondary school at will, as the secondary school has the final say on whether or not to accept a student. In Baden-Württemberg, for example, 43% of the 91,600 pupils who entered secondary school in 2009 were enrolled in a liberal arts secondary school, and one in nine new pupils did not receive a choice of a liberal arts secondary school.

4.3 Traditional German Families' Perceptions of the Educational Streaming

German parents have a slightly different view on the future of their students than Chinese families. About two-thirds of parents believe that educational streaming is correct, that not all students are suitable for higher education, that each student has his or her own strengths, and that there is no need to force everyone to run on the same track as Chinese students do. Different economic bases and social models have created different concepts of education. China's economic take-off in the past 30 years has been driven by a demographic dividend and labor-intensive industries, but we cannot ignore the fact that the price of the demographic dividend is cheap manual labor output, and the status and income of workers have been decreasing for decades. "Work hard to get into a university and sit in an office in the future." In contrast, Germany, with a total population of about 82 million in 2021 of which industrial workers account for 40% of the total workforce and industrial output accounts for more than 30% of GDP, in addition Germany is also recognized as a high welfare country in the world, basically guaranteeing all aspects of employment, housing, and access to medical care for all, which is one of the reasons why Germans have a higher acceptance of educational streaming.

4.4 Vocational Education in Germany

Unlike Gymnasium, which focus on developing students' independent learning skills and laying the foundations for their future academic work, German vocational education: Realchule, Hauptschule and Gesamtschule at higher levels, are schools in which the knowledge and skills of a certain occupation or productive work are the main teaching content, jointly hosted by the government, enterprises and industrial organizations, and whose main characteristics are " pluralistic cooperation, business-led, and externally supported." The state government establishes vocational schools; the joint meeting of state ministers of education and culture issues a "framework plan" for the teaching of cultural and professional subjects in vocational schools; enterprises draw up training plans, implement curricula and systematically arrange vocational training in accordance with educational objectives through relevant laws and regulations and enterprise training plans. The enterprise conducts the training in person or by

commissioning teachers, and finally organizes the apprentices to take mid-term and final examinations and issues certificates to those who pass them (Liang, 2016). Throughout the training and education process, the market demand for specific personnel is met directly without the need to go through the social recruitment process due to the direct downstream training of the enterprise; the pointless consumption of intermediate steps such as recruitment is reduced. In addition, the specialized training of enterprises can maximize the technical level of technical workers in vocational schools and reduce the period of training of talents in enterprises; since enterprises are directly connected with the market, students in vocational schools can learn the latest and most advanced technologies in the market, which greatly improves the productivity of new employees. The current stage of vocational education in Germany is a mature vocational education system based on the current situation of industrial development in Germany, and there is a relatively mature system of school-enterprise cooperation, but of course not all enterprises are qualified to undertake teaching tasks, and their qualifications are also recognized by the relevant industry associations; the professional development of teachers is in line with the market; the social expectations of students trained by vocational schools are also very high; as professional skills are aligned with enterprises regional imbalance in educational resources is also alleviated to some extent.

5. Results

Generally speaking, the “primary” stage of education in Germany effectively meets the needs of German companies at different levels. High-level personnel can basically meet the needs of academic research for independent study through the screening of “primary school” and “higher education”, while technical personnel trained in vocational schools can master basic subjects such as German, mathematics and natural sciences, improve the overall quality of skilled workers and meet the needs of enterprises. The vocational schools are able to train skilled workers, who are able to master basic subjects such as German, mathematics and natural sciences, improve the overall quality of skilled workers and are directly connected to the enterprises in order to achieve employment and meet the needs of enterprises for highly qualified and skilled workers. It was this model of education, combined with the actual economic and social development of Germany, that helped Germany in the post-World War II period and provided a rich pool of talent for Germany to become the number one industrial country in Europe.

6. Discussion

6.1 Chinese Education Streaming Should Putting Students First

In Germany, the “junior high school” stage of education is based on the intellectual and personality development of the four years of primary school. In contrast to the Chinese junior high school triage, which is more score-oriented, German students do not receive a recommendation for admission to a “liberal arts secondary school” even if they have a high score in “academic behavior” but not in “social

behavior". "This is to some extent a streaming. To a certain extent, this sort of streaming is a way for education to fulfill its screening function and is also a way to tailor the education to the student's needs. The critical period for the development of study habits and social behaviors is the first and second grades of primary school, and according to the famous Chinese educator Mr. Ye Shengtao, "The essence of education is the cultivation of habits." It is the habits that students develop from an early age that really widen the gap between students rather than their IQ. In Germany, for those students who have not developed good study habits and social behaviors, and perhaps are not so focused on cultural knowledge, it is not a bad choice to go to a vocational high school to learn a skill that they like or that they are good at, and devote their focus to a career that they like. Therefore, education streaming in China should not rely solely on the results of the secondary school examinations to determine the future direction of students in a broad-brush manner, but rather schools and the education system should provide students with a variety of options and platforms, taking into account their own actual situation before streaming.

6.2 Chinese Educational Streaming Should Focus on the Generation of Self-identity

Erikson's psychology of the self divides personality development into eight stages, of which the age of 12-18 is an important topic in the study of adolescent development, namely, Role Confusion. This is the stage when adolescents have to answer the question "Who am I?" and "What am I going to be?" As an important influencing factor for students, the task of school education is to help students to understand themselves, to help them to establish sameness, to plan their life goals and to establish career, it is the stage of career planning. However, at present, career-related courses are almost neglected at junior high school level, high school level and even university level in China, and most students are forced to complete career planning when they have to start earning a living. Some students who did not get into high school were forced to flow into society or their parents visited vocational high schools or technical schools under the guidance of admissions teachers and then "discussed" with the students to decide their future professional direction; most of the students who graduated from high school and got into university also chose schools according to their scores and then chose their majors according to the schools after the college entrance examination results were announced. During this period, students themselves lack knowledge and understanding of their future career direction, and they rarely think about whether the career or major can realize their ideals, values, and outlook on life. Most of the students even postpone the "sameness" that should be completed before they turn 18 until they graduate from university and have to make the decision of "where do I want to go" after graduation. "These problems will not be solved by a few "career planning lessons" or "counseling lessons" in school. These problems will not be solved by a few "career planning" or "counseling" lessons at school. The answer to this question in Germany's streaming system may be worthy of our consideration. In addition, German families have to choose a school with the right focus according to the student's personality, interests and learning ability. At the junior high school level, students can also choose a subject or vocational skill that suits them after completing the compulsory subjects. Especially in the

Gesamtschule or Realchule, the schools provide students with a lot of opportunities to practice in line with society, which has a great influence on the students' proper understanding of their career status and their own development. Therefore, the current streaming of education in China should not only focus on the quality of education, but also on the psychological development of students in schools, helping students to perfect their cognitive system according to the laws of their psychological development at each stage of education, while increasing students' social learning, improving their cognitive self, and guiding them out of confusion and finding their own ideals and goals.

6.3 Chinese Vocational Education Should Explore the Path of School-enterprise Cooperation that Meets Its Actual Needs

Vocational education is inevitably inseparable from concrete practical activities of vocational skills. Currently, most of vocational schools have realized the importance of cooperation between schools and enterprises, and are trying their best to provide students with plenty of internship opportunities. Many excellent vocational schools' best majors are indeed favored by all sectors of society, companies also welcome these outstanding students to have an internship there. However, there are still some majors in some schools that do not have suitable internship places, resulting in the final internship activities not matching the majors, and some internship activities are even simplified to experiencing work in electronic factories, and the graduates cannot directly match with the talents needed by the Society, which results in the fact that there is no direct correspondence between these graduates and the talents needed by the society. This phenomenon is partly due to the inadequate mechanisms of school-social enterprise cooperation as well as the limitations of the teaching force and outdated textbooks.

Not all of majors in all schools can be matched with companies , but schools are often forced to organize non-matched internships because of the requirements for internship visits. The key to this problem lies in how to build a bridge between schools and enterprises in order to match the needs of enterprises with schools. The German experience is that enterprises act directly, sending or hiring professional instructors to teach professional courses directly after obtaining the approval of the industry and education departments, which ensures that students master the basic knowledge in line with educational standards as well as their professional competences in line with social need.

The limitations of the teaching force are mainly manifested in the scarcity of teachers' resources, and the educational resources of regions with different levels of economic development are also different, and the limitations of recruiting teachers for professional courses are not quite in line with the actual situation. Take vehicle engineering or auto maintenance as an example, some vocational schools explicitly require candidates to have a bachelor's degree or higher and a secondary teaching certificate when recruiting professional teachers. However, in reality, very few experienced auto mechanics have a bachelor's degree and basically do not have the energy to obtain a secondary teaching license, while most of those who do have a degree and a teaching license are college graduates without rich experience. Not only that, full-time professional teachers in school will also be gradually out of step with the mainstream technology development, because they are away from the front line of work and

can not be the first contact with the most advanced technology in the market. This results in the phenomenon that even if students have excellent grades in vocational schools, they still have to learn from scratch for one to three years before they can complete their work independently once they reach the front-line market. Therefore, how some public vocational schools can hire front-line lecturers with rich experience or cooperate directly with enterprises according to the professional development is a major issue to be considered at this stage.

7. Conclusion

The mature vocational education system is the basis for the diversion of general vocational education in Germany. German vocational education adopts "diversification" according to the actual situation of the country, not only the diversification of vocational school founders, but also the diversification of management and responsibility system, while at present, most of the vocational schools in China are public. How to bring enterprises in, how to cooperate with enterprises, and what kind of responsibility enterprises should take in the cooperation will be the main research direction for the development of Chinese vocational education in the future. In addition, Chinese vocational education places too much emphasis on the mastery of students' skills at the expense of their psychological development. Therefore, schools must strengthen students' physical and mental development, pay attention to the development of their "human" attributes, follow the laws of their psychological development and help them to improve their cognitive system and develop a sense of professionalism. If you want to change society's attitude towards vocational education. The perception of vocational education by society and traditional Chinese families will only change when those trained in vocational education realise their social value and are able to satisfy their spiritual and material needs through their technical skills.

References

Ditton, Hartmut, & Reinders, Heinz. (2011). *Überblick: DasBildungssystem*. https://doi.org/10.1007/978-3-531-93015-2_12

Fu, H.-M., & Xi, Q.-W. (2013). The inspiration of German vocational education to China's vocational education system and teaching methods. *Vocational Times*, *09*, 24-25+28.

Liang, Q. (2016). The German dual system vocational education system and its inspiration. V*ocational and technical education*, *7*(04), 76-79.

Liang, Z. H. (2018). The waning of the third generation "baby boom": A change not seen in 40 years. *Zhongtai Macro Weekly Reflections*, *13*.

Note

Note 1. China Academy of Educational Sciences Project Group. National report on satisfaction assessment of secondary vocational education. (2020).