colleges or centers, but Fudan University has established a General Education Board to design and plan the core curriculum.

Early Developments, with a Long Road Ahead

Although general education is under development at first-class universities, the majority of Chinese universities are only now beginning to establish a relevant framework. They still face a number of problems and challenges, including, first, recognizing the value of general education. A widely held view among many university staff and students, as well as among the general public, is that liberal education is useless, while professional education is considered valuable. Second, the disciplinary foundation of general education is problematic. Many Chinese universities have developed from specialized colleges with a relatively weak basis of expertise in the humanities, social sciences, and natural sciences. Third, the pedagogy has to be improved, as many teachers are accustomed to transferring knowledge on various topics to students, with lectures as their main method of instruction. Fourth, the number of academic hours and credits dedicated to general education is limited; the curricula of general education programs need to be revised, allocating more academic hours and credits to general education.

These problems will not be easily solved. Chinese universities need to increase curriculum resources allocated to general education, to improve the capacity of faculty and to reform the professional education model. The road ahead for general education in China remains long.

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New "Startups" in a Rigid Higher Education System: China's Young Elite Institutions

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In the past decade, several elite institutions have been established in Mainland China with ambitious visions of becoming world-class, small-scale research universities. Typical examples include Southern University of Science and Technology (SUSTech) opened in 2011, ShanghaiTech University (ShanghaiTech), established in 2013, and Westlake Institute for Advanced Study (WIAS), founded in 2016 to prepare for the establishment of Westlake University. With limited intervention and zero financial support from the central government—as opposed to China's other existing universities—these three young elite institutions have unique development strategies, funding models, and admissions policies. They were started primarily with the purpose of establishing world-class Chinese universities based on alternative models. Adequate funding is primarily provided by the local municipal governments or the private sector. Admission policies tend to be more flexible, with some degree of independence from the existing system based on the national college entrance examination (*gaokao*). The establishment of such institutions can be regarded as a bottom-up innovation in China's higher education development. However, considering the respective institutional visions and science-focused strategies, it might also be the result of a new utilitarian direction chosen by stakeholders—including local municipal governments and higher education practitioners—probably driven by global university rankings.

Three Young Elite Institutions

SUSTech is a public, small-scale research university located in Shenzhen, originally founded by the local municipal government in 2011. In 2012, its establishment was endorsed by the Chinese ministry of education and the university was acknowledged as a platform for "experimenting with, and catalyzing, Chinese higher education reform." In 2011, without permission from the central government, SUSTech recruited its first cohort of 45 undergraduate students based on its own standards. In 2016, it recruited its first cohort of graduate students. Presently, SUSTech has 260 faculty members and 3,228 undergraduate students in 14 academic units (i.e., departments and schools), mainly concentrating on science and engineering disciplines such as physics, chemistry, biology, and electronic engineering.

ShanghaiTech is a small-scale, public research university in Shanghai, established jointly by the municipal government and the Chinese Academy of Sciences in 2013. In 2014, ShanghaiTech recruited its first cohort of 207 undergraduate students from nine provinces, based on its own admissions criteria. ShanghaiTech has four academic schools (physical science and technology; information science and technology; life science and technology; and entrepreneurship and management) and two research institutes (Advanced Immunochemical Studies and iHuman Institute). It now has 849 undergraduate students and 1,272 graduate

students, including 202 doctoral students. ShanghaiTech plans to build up a faculty of 1,000 professors, including 500 tenure-track/tenured professors recruited from world-class institutions.

WIAS is a nonprofit, private research institute located in Hangzhou, focusing on science and engineering disciplines. It was founded in December 2016 by the municipal government and Hangzhou Westlake Education Foundation, a private foundation initiated by a group of top Chinese scientists. One of its cofounders, a famous biologist from Tsinghua University, serves as the president of the institute. WIAS currently has four research institutes focusing on the fields of biology, basic medical sciences, natural sciences, and advanced technology. The main purpose of founding this institution was to prepare for the establishment of a new world-class, private, small-scale, elite research university, Westlake University. The municipal government provides financial and policy supports, and has set up a special unit to "promote its development" (*tuijin xiangmu jianshe*).

Similarities and Differences

According to the missions and visions of these new institutions, there are three main similarities among them in terms of development strategies. First, they all plan to develop into world-class, small-scale research universities, mainly concentrating on the disciplines of science and engineering. Second, they all chose leading American research universities as models or examples. For instance, WIAS acknowledges that it draws lessons from both Caltech and the educational philosophy of Stanford University in its continuing evolution to Westlake University. In 2016, the president of SUSTech stated that the university aimed to become a "Chinese Stanford." However, compared to American private research universities, local governments have played more active roles, in line with China's political system. Third, all three institutions attempt to explore alternative models to educate students and run schools. But for SUSTech and ShanghaiTech, this may be constrained by the fact that they are publicly funded: during the past five years, SUSTech has become increasingly similar to other Chinese universities in terms of admission policies.

As mentioned above, SUSTech and ShanghaiTech are mainly funded by the local municipal governments. The governments of Shenzhen and Shanghai, the two richest cities in China, are able to provide sufficient and sustainable funding to their respective institutions. WIAS and the future Westlake University are very different. As a private institution, WIAS is mainly funded by the private Hangzhou Westlake Education Foundation. Its contributors include several famous Chinese entrepreneurs. The municipal government of Hangzhou provided part of the startup funding. It can be expected that as a mainly privately funded university, Westlake University may have a greater autonomy compared to SUSTech and ShanghaiTech.

To some extent, admission criteria reflect this degree of autonomy. SUSTech is no longer unique. Although it still has its own test (which weighs for 30 percent in the decision to admit a candidate) and considers applicants' high school grades (10 percent), *gaokao* scores are the main criterion (60 percent). ShanghaiTech has more diversified admission standards. Applicants' personal statements, reference letters, high school grades, and *gaokao* scores are all considered. "Comprehensive interviews" are used to examine their "overall quality (*zonghe suzhi*)." Although the *gaokao* score weighs the most, the admission criteria of both SUSTech and ShanghaiTech are much less rigid than at other Chinese universities, where in most cases the *gaokao* score is the only criterion. As a private, small-scale university, Westlake University may in the future have even more flexible admission policies.

The establishment of such institutions can be regarded as a bottom-up innovation in China's higher education development.

Bottom-up Innovation or Utilitarian Choice?

As mentioned, such new "startups" can be regarded as significant bottom-up innovations in the Chinese higher education sector. As opposed to existing Chinese universities where the Soviet influence is still felt in spite of three decades of reforms, these young institutions have followed Western models from the outset, although the intervention of local governments is significant, in line with China's political system.

However, the primary motivations of both scholar-practitioners and local governments may be utilitarian, and probably driven by world university rankings. The research focus of these institutions, as well as their strategies of following the models of American top research universities and recruiting famous scientists, meet to a great extent the evaluation criteria of mainstream rankings. For local officials, establishing top-ranked universities is an eye-catching "vanity project" (*zhengji gongcheng*), which adds points for promotion. Therefore, one of the potential problems is that essential tasks, such as improving the quality of education and enhancing the research capacity of young scholars, might be ignored to some extent. Moreover, although cen-

tral government intervention is relatively limited, excessive local government intervention may also hinder institutional innovation. Since the municipal government plays a lesser role in the management of WIAS, it will be interesting to see how Westlake University develops. In other words, these young "startups" require the test of time.

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