International Technical High School Analysis (NC^{3}T Design Specifications)

Germany

Description of the German School System

Compulsory school begins at age 6 in Germany and lasts for nine to ten years, depending on the state (called a *Länder*). Generally, students attend primary school for four years, then are tracked into one of three pathways at about age 10: *gymnasium*, a demanding academic program that ends with a university qualification; *realschule*, a less demanding academic program leading to a lower secondary diploma; or *hauptschule*, designed for students with less academic ability and leading to a "school-leaving certificate". After compulsory school, at age 15 or 16, students enter either general upper secondary education or vocational education. Slightly fewer than half of students pursue general upper secondary education, and slightly more than half of students pursue vocational education. Most students in vocational education enroll in Germany's dual system, and others enroll in full-time vocational schools. The dual system consists 12 hours per week of school combined with an apprenticeship in a training firm and requires only the completion of compulsory school for entry, though the majority of apprentices have a secondary completion credential, including about 20% who have a university qualification. Full-time vocational schooling requires a lower secondary diploma, lasts two to three years, and may include an internship. Vocational education may continue after upper secondary, at trade and technical schools (two to four years), postsecondary schools that provide vocationally orientated programs, or vocational academies. (9-10)

Governance

Responsibility for vocational education is shared among five entities: the federal government, state government, local government, business partners, and Chambers of Commerce and Industry. The Federal Ministry of Education and Research has overall responsibility. It administers the Vocational Education and Training Act, publishes an annual vocational education report, funds and steers the Federal Institute for Vocational Education and Training (a federal research institute), initiates program improvement, and has responsibility for the in-company training portion of the dual system. With agreement from the Federal Ministry of Education and Research, specialized federal ministries endorse individual occupation qualifications. State governments (the *Länder*) are responsible for the part-time vocational education schools of the dual system and the full-time vocational education schools; they provide school curricula, teacher training and pay, vocational school funding, and legal supervision of the Chambers of Commerce and Industry. Local authorities are responsible for

equipment and infrastructure in the schools. Business partners set apprenticeship salaries, bear the costs of workplace training, participate in the design and provision of vocational education, and participate in development and updating of ordinances[1]. The Chambers of Commerce and Industry provide advisory services to participating business partners, supervise company based training, register apprenticeship contracts, assess training firms, monitor training, assess vocational education trainers, and carry out apprentice final examinations. (10-13, 28)

Teacher Preparation

Three types of technical professionals serve German vocational education students. Those who teach theoretical subjects must have a university qualification or equivalent. Those who teach technical skills typically have an advanced background in the specific occupation. Both types of teachers also have in-service training and training in teaching practice. In-company trainers must pass an aptitude test and demonstrate knowledge of the occupation they provide training for. (10)

Career Guidance

No single agency is responsible for insuring German students receive effective career guidance, and the OECD team had much to say about the importance of career guidance, the lack of career guidance for German students, the consequences of poor career guidance such as poor occupation choices and increased drop-out rates at the upper secondary level and, and reforms to the delivery of career guidance. While students in some areas get good guidance and German students may find career guidance in many forms, in most states it is inconsistent, fragmented, and of variable quality with little quality control and few required qualifications. The federal government has implemented several initiatives to expand and improve the quality of career guidance, but the results were not yet apparent at the time of the OECD visit. (5, 6, 17, 27-29, 32-34)

Business and Social Partner Participation

Business and social partners play a strong role in German vocational education. In 2006, the federal government convened the Innovation Circle on Vocational Education and Training, a group composed of representatives from business, trade unions, academia, and the states, and charged with providing suggestions for the future development of vocational education. The Chambers of Commerce and Industry participate in a federal program designed to increase the number of apprenticeship sites. (12) The Chambers also carry out the final examination process for apprentices' technical skills, as noted above, but the examination boards that develop the assessments are composed of teachers, employers, and trade union representatives. Despite the strong involvement of business and other social partners and the overall positive outcomes of the dual system, the OECD team cited several studies indicating that the dual system would

[1] Ordinances "regulate the duration of an apprenticeship, describe the profile of the profession, and set out final examination requirements" (10)

benefit from increased coordination between part-time schools and apprenticeship sites, and that apprentices are not entirely satisfied with the quality of their training, but that satisfaction is higher all around in areas where collaboration with business partners was strong (40-41). Although German businesses play a strong and valuable role in vocational education, national, state, local, and business/company checks and balances aim to ensure that employers' short-term needs do not supersede long-term education goals (5, 12).

Value of Vocational Education

Vocational education in Germany is well supported, with policy, research, review, and funding from many sectors of government and business. The level of engagement of so many political and business sectors indicates a high level of commitment to vocational education. (14) More than half the students of a typical age cohort participate in upper secondary vocational education, with approximately 75% of those enrolling in the dual system (17). In the dual system of vocational education, apprentices spend 12 hours per week in part-time vocational schools and three to four days of week in training firms, following the training plan set out in ordinances, and earning a salary that increases with each year of the apprenticeship and is generally one-third of the starting salary for a skilled worker (10).

The German vocational education system covers at the upper secondary level many technical skills and trades that are covered at the postsecondary level in other countries, which, in addition to strong support, participation, and overall positive outcomes at the upper secondary level, may discourage participation in postsecondary education (13, 43-44). However, the OECD report cites studies that suggest that while upper secondary vocational education graduates start their careers in similar positions to postsecondary graduates, the gap between the two groups widens over time, accelerating near retirement, possibly due to the deterioration of technical skills in a rapidly changing economy (38). This underscores the importance of strong numeracy, literacy, and lifelong learning skills that German vocational education graduates may lack.

Pathways

As described above, German students are tracked into one of three school types at age 10, where transition out of a school type is very difficult, and where the factors that determined the placement – such as poor academic performance – are not addressed or possibly perpetuated. Further, vocational education students choose an occupation at the end of compulsory education (at approximately age 15), solidified for apprentices by a three-year contract that most sign, and resulting in low participation in postsecondary education. (9-10, 32, 48)

Students who graduate from the gymnasia are prepared for immediate entry to postsecondary education, but vocational education graduates must pursue alternative routes to postsecondary education. For example, they must have work experience (such as attaining the level of master craftsman or other advanced title) in order to enter postsecondary education. Requisite work

experience may not provide the skills necessary to succeed at the postsecondary level, and may discourage students from leaving a job in order to enter postsecondary education. Even though Germany is removing some barriers to postsecondary education, unless vocational education graduates have a stronger academic background, they will not succeed and/or will not attempt postsecondary education. (20, 32, 38, 43-45, 49-50)

Differences Between Vocational and Academic Preparation

As described above, Germany tracks students at age 10 into lower secondary environments designed for three separate levels of academic ability. Again at the end of compulsory education at about age 15, students are further tracked into academic preparation (resulting in university qualification) or vocational education. Basic numeracy and literacy skills appear to vary significantly among German students, depending on the nature of their lower secondary track. Graduates of *hauptschule* (the track for students with less academic ability) may not acquire sufficient basic numeracy and literacy skills to begin or succeed in vocational education or in work. Germany employs a strategy of imbedding academic skills into technical teaching, which the OECD team identified as a strongly positive aspect of the German system; however, the team also found that because of the early tracking at age 10, students may not arrive at vocational education with sufficient basic numeracy and literacy skills to benefit from this strategy, and that since Germany does not assess basic numeracy and literacy skills at the end of vocational education, students' gaps may not be identified or addressed. German apprentices receive only 160 hours per year of general education instruction, divided among German, English, economics or social science, and sports. Employers also report concern that students entering apprenticeships lack sufficient reading, writing, and mathematics skills, as well as communication, problem solving, and conflict resolution skills. The majority of these students are unable to find apprenticeship placements and must, therefore, become part of the transition system.

The OECD team worried that "apprenticeship countries" may under value academic skills, and that their young people, lacking these skills and other skills for lifelong learning, may become increasingly unable to compete in a rapidly changing economy, as well as unable to become effective participants and leaders in their communities. "This raises the larger question of how to ensure that the broader purposes of schooling are respected in a system principally focused on preparing young people for work." (34-40)

Disadvantaged Students

Germany has instituted several programs to assist disadvantaged students. Students may take advantage of a formal transition system that provides a basic vocational or pre-vocational year that includes career guidance and basic vocational skills, and is designed to move students into the workplace, an apprenticeship, or a full-time vocational school (9, 18). The German government pays a bonus to training firms that accept apprentices who have had difficulty obtaining a placement. Students who have not found a placement by September 30 of each year, who are socially disadvantaged, or who have a learning disability may take advantage of

an internship program in which a training company accepts the student on a 6-12-month trial basis. State governments also provide various programs to assist disadvantaged students, which vary according to the state. (11, 24-27)

A 2008 pilot program for special needs students and students with poor academic skills allows participants to spend 80 hours in a workshop, trying out three different occupations under a trainer's supervision. Upon completion, participants receive a certificate that describes their preferences, competencies, and any need for special support. (30, 33)

Use of Data to Assess Outcomes

Germany enjoys the benefits of the Federal Institute of Vocational Education and Training, which is a research institute devoted to vocational education, as well as a national network of smaller research centers that study different aspects of the system. Germany has, therefore, formalized and institutionalized mechanisms for assessing and improving its vocational education system. As an indicator of the importance Germany places on vocational education, Germany has instituted a number of pilot programs and reforms as a result of the work of the various research institutes. Nevertheless, as described above, many German students complete vocational education with inadequate numeracy, literacy, and lifelong learning skills, and are subject to widening economic depreciation compared with postsecondary graduates. (5, 14, 21-22)

Looking Forward

The OECD report identified four key areas of concentration:

- Improved cooperation among stakeholders to ease the transition from school to work, reduce the cost of the transition system for disadvantaged students, and improve the assessment system
- Improved career guidance
- Attention to vocational education graduates' basic numeracy, literacy, and lifelong learning skills
- Open access to postsecondary education