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ABSTRACT

This report examines data and data quality on vocational education and training available from the seven highly developed countries that make up the G-7: Canada, France, Germany, Japan, Italy, the United Kingdom, and the United States. Following an introduction, chapter 2 describes the nature of vocational education and training opportunities at the upper secondary level and beyond in each country, emphasizing programs that fall under the jurisdictions of education ministries. One-page descriptions of the vocational education systems in each country are followed by extensive narratives for each vocational education system that focus on these areas: school-based vocational preparation and training, what the vocational system looked like during the most recent year for which data are available, and the most common ways of obtaining vocational skills. Chapter 3 describes the following: international comparisons of data on vocational education; contextual and programmatic differences; key indicators that one would want to compare across vocational systems; data that international organizations have compiled regarding these indicators; degree to which these key comparisons can be made using existing data; and data improvements necessary to prepare all these key indicators. Appendixes include the following: a description of surveys and studies in each G-7 country that contain information pertinent to assessments of vocational education and training programs, and a vocational education data information sources contact list. Contains 118 references. (YLB)

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Vocational Education in G–7 Countries: Profiles and Data

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National Center for Education Statistics

"The purpose of the Center shall be to collect, analyze, and disseminate statistics and other data related to education in the United States and in other nations."—Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e–1).

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Foreword

The National Center for Education Statistics (NCES) collects and publishes information on the condition of education in the United States. The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (Public Law 101-392, Section 421) mandated that NCES

> **carry out an assessment of data availability and adequacy with respect to international competitiveness in vocational skills. To the extent practicable, the assessment shall include comparative policy-relevant data on vocational education in nations which are major trade partners of the United States. The assessment shall at a minimum identify available internationally comparative data on vocational education and options for obtaining and upgrading such data.**

In responding to this mandate, NCES focused on describing and presenting statistical information about vocational education in the G-7 countries—Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States—which are among the most highly developed economies. These comparisons were believed to be especially useful, since they reflect circumstances across countries that share many similarities but that use substantially different early vocational education and training strategies.

Several factors influenced the nature of the inquiry. First, there is no common definition of what constitutes vocational education and training among countries. Because the nature and quality of data vary from system to system, efforts to compare vocational education systems require an understanding of the vocational education and training systems in the countries being compared.

Second, this report is based on data from government ministries and selected international sources. The accuracy of the reporting systems from country to country, upon which the data in this report are based, has not been assessed.

Third, because there is little agreement cross-nationally regarding the kinds of information governments would like to have about each others' vocational education systems, most data are designed to serve national, rather than international, needs. As policymakers and practitioners examine how best to confront issues associated with the school-to-work transition, obtaining information about vocational education structures, processes, and programs in other countries is of interest.

Fourth, the kinds of information included in this report were selected by a group of experts on vocational education in the United States and abroad. The report is not intended to be exhaustive or present information and data on all policy-relevant subjects involving vocational education.

NCES has become particularly involved in efforts to provide reliable cross-national comparisons that can constructively enhance discussions about the future direction of our education system. To that end, NCES participates in a number of activities in the international forum that provide information central to building a world-class education system for the 21st century, including the Third International Math and Science Study (TIMSS) and the Organization for Economic Cooperation and Development (OECD) International Education Indicators Project (INES).

Emerson J. Elliott
Commissioner of Education Statistics

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A number of individuals interested in both vocational education and cross-national data comparisons helped to plan and organize this report.

James Houser and John Ralph of the Data Development Division in the National Center for Education Statistics (NCES), which is under the direction of Jeanne E. Griffith, Associate Commissioner, coordinated this project. In the Division, Mary Frase, Dawn Nelson, Eugene Owen, and Lois Peak offered comments.

Before work began, a meeting of experts was held to review and consider ways of approaching issues associated with the availability and quality of cross-national data on vocational education. David Baker (Catholic University), Ann Heald (University of Maryland), Alan Kerckhoff (Duke University), Sigurd Nilsen (U.S. General Accounting Office), Wayne Riddle (Congressional Research Service), and Hong Tan (World Bank) participated in this meeting.

A number of reviewers made suggestions that strengthened this report: Les Bell (University of Warwick, England), Norberto Boitani (Organization for Economic Cooperation and Development), Jim Foti (Bureau of Apprenticeship and Training, U.S. Department of Labor), Douglas Hodgekinson (British Columbia Ministry of Education), Boyd Pelly (Council of Ministers of Education, Canada), David Raffe (University of Edinburgh, Scotland), David Stern (University of California, Berkeley), and Tom Rohlen (Stanford University).

Executive Summary

Reforms associated with the Carl D. Perkins Vocational and Applied Technology Amendments of 1990 (Public Law 101-392) have intensified U.S. interest in how other highly developed countries—some with considerable commitments to vocational education and training—are addressing issues of education and labor force preparation. Despite differences in education systems from country to country, in today's global economy all highly industrialized nations are working to achieve an appropriate link between education and training.

This report describes and contrasts vocational education systems in the G-7 countries—Canada, France, Germany, Japan, Italy, the United Kingdom, and the United States. In addition, the report describes some key cross-national indicators of the status of vocational education and compares data across countries. The G-7 countries are the most highly industrialized and developed in the world. While the G-7 have many things in common, each country approaches issues of vocational education and training in a different way.

Vocational Education and Training in G-7 Countries

From country to country, the nature of vocational education and training reflects deep cultural roots, national predispositions, and historic traditions. Vocational program strategies are closely linked to the priorities of each national education system. The general characteristics of the vocational effort in each G-7 country are as follows.

Canada. Responsibility for vocational education rests at the provincial level and for the most part is concentrated at the postsecondary level in community colleges. Vocational education is classified as short- or long-term. Short-term programs usually do not exceed 1 year, and focus on entry-level job preparation. Long-term programs, often 2 to 3 years in duration, are more advanced and technical in nature. In 1991, 6 percent of 18-year-olds, 10 percent of 19-year-olds, and 10 percent of 20-year-olds were enrolled full time in long-term vocational programs. In addition to postsecondary vocational programs, there is also a registered apprenticeship program, which has grown substantially in recent years. Those completing apprenticeship programs have a strong record of obtaining jobs in their trade area.

France. Vocational education begins in grades 8 and 9 for those who are not preparing for postsecondary education. At the secondary level, a variety of programs and certificates are available that prepare students for either entry- or middle-level supervisory positions. In 1991–92, about 30 percent of students enrolled at the upper secondary level were attending vocational–technical programs. Upper secondary vocational programs are offered by several types of institutions: vocational high schools, general or academic high schools, and apprentice training centers. In 1989, about 11 percent of all full-time upper secondary students participated in 1- to 3-year apprenticeship programs.

Germany. Vocational education and training begins at the upper secondary level. In 1991, 74 percent of all upper secondary students were enrolled in a vocational education program, attending either full- or part-time vocational schools, or participating in the "dual system"—a partnership between industry and the government that is designed to provide young people with supervised on-the-job training supported by part-time general and vocational instruction. Approximately 90 percent of young people who complete lower secondary school eventually enter dual system training. In 1986 (the last year for which data are available), 57 percent of 16-

to 18-year-olds were participating in the dual system. The apprenticeships within the dual system last from 2 to 3.5 years.

Italy. Vocational education is focused on the upper secondary grades. Programs are provided by both the schools and the labor ministry. In 1989–90, 47 percent of upper secondary students attended technical schools, which provide 2 years of academic education and 3 years of occupational training. In addition, 19 percent of upper secondary students attended vocational schools, which generally provide 2- to 3-year occupational programs whose curricula are based upon industry requirements. Outside the education system, a substantial apprenticeship program is designed for youth who have left school.

Japan. Most vocational education occurs at the upper secondary and postsecondary levels, and to an extent through businesses themselves. High schools and vocational training schools offer specialized programs in particular occupational areas. In 1989, 26 percent of high school students pursued studies in a vocational field. "Miscellaneous schools," which are a type of vocational training school, offer both upper secondary and postsecondary programs to prepare students for national licensing examinations in certain fields. These schools enroll approximately one-third of all upper secondary graduates and are predominantly postsecondary.

United Kingdom. In England and Wales, vocational education and job training are available to students at age 16. In 1992–93, 25 percent of 16-year-olds, 20 percent of 17-year-olds, and 11 percent of 18-year-olds were enrolled in full-time vocational education. In 1990, 15 percent of 16- to 18-year-olds participated in apprenticeship programs leading to vocational qualifications offered by the Department of Employment for school leavers. A variety of professional and trade organizations also offer vocational certificates, but there are no universally accepted credentials.

United States. Vocational education spans secondary and postsecondary levels in both the public and private sectors. At the secondary level, students are able to explore both academic and vocational curricula without being placed in a strict track. Most vocational education takes place in comprehensive high schools, and in 1987 about one-third of all high school graduates completed the equivalent of at least four courses in vocational subjects. At the postsecondary level, almost one-half of all vocational degrees and awards are granted at private-less-than-2-year institutions. Public 2-year institutions are the next most prominent type of postsecondary vocational institution, offering about one-third of all vocational degrees and awards.

Cross-National Comparisons

Assuring relatively comparable cross-national data requires care since the distinctive features of vocational education and training systems make analytic equivalence difficult to achieve. Keeping this concern in mind, three indicators are discussed in this report—*participation rates, vocational student supply and demand, and labor market outcomes for participants and completers.*

Participation Rates. All G-7 countries produce data on vocational sector participation at the upper secondary and postsecondary levels. The data indicate that some countries focus their vocational education and training at the upper secondary level, while others do so at the postsecondary level. The United States and Japan, as compared with the rest of the G-7, seem to defer vocational training to the postsecondary level and have a high proportion of young adults participating in postsecondary vocational education.

Vocational Student Supply and Demand. This indicator describes the vocational education and training priorities across countries, as they are reflected in the kinds of programs available, the extent of enrollment in different curricula, and the demand for workers in each field of study.

Across the G-7, little information can be found on unmet demand for student placement, or oversupply or undersupply of graduate and certificate holders by occupation and field. As a result, it is difficult to determine whether or not countries encourage student enrollment in occupational clusters that are in demand and how that demand differs from country to country.

Labor Force Outcomes. Comparisons of labor force outcomes represent ways of estimating the success of vocational education and training programs and the success of completers once they are in the labor force (especially employment outcomes and earnings). Some countries use national household surveys (like the Current Population Survey in the United States) to analyze relationships of employment and earnings to education. However, considerable detail is necessary to link participation in particular vocational curricula and programs to labor force outcomes, and this is rarely available.

The concluding section of the report describes opportunities to improve the quality of data on each of the indicators. Among the three indicators, data on participation rates in vocational education are most amenable to improvement through cooperative efforts of international organizations like the OECD. Given differences across countries, international organizations represent the appropriate forum in which to compare data on vocational education systems and to contrast trends over time.

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Chapter 1

Introduction

At the threshold of the 21st century, policymakers and educators are struggling to ensure America's future economic, competitive strength. The problem was well-framed by the National Commission on Excellence in Education a decade ago:

> The world is one global village. We live among determined, well-educated, and strongly motivated competitors. We compete with them for international standing and markets, not only with products but also with the ideas of our laboratories and neighborhood workshops. America's position in the world may once have been reasonably secure with only a few exceptionally well-trained men and women. It is no longer. . . . Knowledge, learning, information and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world. . . . If only to keep and improve on the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our education system for the benefit of all (National Commission on Excellence in Education 1983, 6–7).

The implications of this changing global economy dramatize the increasingly important linkages between education and the economy, and raise many questions regarding what students are trained to do, and how they are prepared for the world of work.

- How can students be best prepared for the rigors of a changing and demanding labor market?
- How can students' skills be harnessed in ways that best promote national economic prosperity?
- How can the education system best support efforts to ensure that America can compete successfully in the future international marketplace of goods, services, and ideas?

One authority has captured the spirit of the current debate this way:

> Over the past decade there has been an emerging consensus that the United States needs to increase both the amount and the quality of education and training its young people receive. It is with respect to the economy, in particular, that education is thought to be important: Education and training provide the "raw materials" for economic preservation and growth. Specifically, worries about the education and training system have to do with providing individual opportunity, promoting prosperity in the national economy, and strengthening the country's ability to compete internationally (Stern 1992, 9).

How are these many objectives to be achieved? The questions are daunting, and the answers are unclear.

Recent reforms associated with the Perkins Act have invigorated a dialogue between vocational education policymakers and practitioners. These efforts have also piqued interest in how other highly developed countries—some with considerable commitments to vocational education and training—are addressing issues of education and labor force preparation. Despite real differences in education systems, in today's global economy all highly industrialized nations

are working to ensure a strong relationship between education and training and national economic objectives.

To achieve an appropriate link between schooling and training, developed countries have generally focused on postcompulsory education—the years immediately following basic schooling, during which time students in most countries remain in school, and many at least in theory are preparing for the world of work. But in recent years, many developed countries have experienced significant increases in unemployment rates among recent school leavers, and efforts are being made to sharpen postcompulsory training strategies. So it is not surprising that the United States, like many of its trading partners, is interested in understanding programs and policies supporting the work force preparation of youth in other countries in order to determine how its own programs and policies might be improved.

Secondary- and Postsecondary-Level Vocational Education and Training Across the G-7: An Elusive Mosaic

In G-7 countries, the majority of youth undergo their initial training for the labor market after completing compulsory education. (However, Germany is an exception since compulsory education extends to age 18.) In most of these countries, postcompulsory education has, in fact, become a stage of transition—between school and work for many, school and higher education for some, and for a rather large minority school and unemployment (OECD 1989).

Data from seven nations were reviewed for this report, and although each country is highly developed, the vocational education and training landscape is characterized by very different policies and program arrangements. In some countries, most of the vocational offerings are provided through the educational system (Canada, France, and the United States). In other countries, most young people enter apprenticeships, which involve both on-the-job training and part-time education (Germany). In other countries, the system provides a mix of some school-based programs and some apprenticeship and training programs that are primarily outside the education system (Italy and the United Kingdom). In Japan, private businesses play a strong role in training, although some school-based upper secondary programs are available to students who are not bound for postsecondary education before they enter the labor market. Each system is described in this report. The general point, however, is that different countries have approached postcompulsory education at the upper secondary and postsecondary levels in various ways, reflecting national traditions and culture and different ways of organizing vocational training opportunities. The complex structure of each vocational education and training system further reflects the fact that programs are serving multiple objectives. The Organization for Economic Cooperation and Development (OECD) notes:

> In most countries opportunities for [16- to 19-year-olds] have been traditionally more varied and scattered than at other levels, usually offered in diverse settings, under different administrations and with strong involvement of enterprises and the private sector (OECD 1985b, 43–44).

Vocational education and training are set primarily in schools in some countries, while in others they are primarily based outside of the school and include a strong on-the-job training component. In some countries, vocational education and training take place in formal programs that provide well-recognized credentials, whereas in other countries such education and training are based on an informal arrangement with a school or employer. Selecting an analytical focus—which sectors to describe (school or nonschool), which levels (upper secondary or upper secondary and beyond), and which types of programs (formal or nonformal or both)—effectively defines the complicated matrix of provision and opportunity that constitutes vocational education and training at the postcompulsory level. To capture the breadth of vocational and training

opportunities across the G-7, one cannot be terribly rigid about each aspect of the analytical focus, because in doing so one might miss the essential nature of programs across countries.

Purpose of This Report

This report examines data and data quality on vocational education and training available from the seven highly developed countries that make up the G-7. The Carl D. Perkins Vocational and Applied Technology Amendments of 1990 (Public Law 101-392, Section 421) mandates that the U.S. Department of Education's National Center for Education Statistics (NCES) assess international data on vocational skills.

Because data from international sources are scarce, it is difficult to analyze the competitiveness of vocational skills. This report focuses on describing and comparing data on the status of vocational preparation cross-nationally. Within the limitations of existing data published by government sources, this report describes the vocational terrain and the data pertaining to vocational education and training among America and its G-7 partners—the most highly developed, advanced economies in the world.

Moreover, this report describes data that are available through government ministries and related sources. It does not attempt any new data analyses and provides only minor reanalyses. Since the data reported here are primarily derived from government sources in each country, it is not possible to assure that the quality of other countries' data meets the statistical standards of NCES.

Organization of This Report

This report consists of three chapters and two appendices. Following this introduction, chapter 2 describes and characterizes the vocational education systems in each of the G-7 countries. The purpose of the chapter is to describe how each country's vocational education and training system is organized and how it is linked to the general education system at the secondary and postsecondary levels. This chapter is important because it provides a context for determining what is actually being compared in comparisons of data from two countries providing vocational education and training. Readers who only seek a basic understanding of vocational education and training in the G-7 countries might just refer to pages 7–13 of this chapter, which provide one-page descriptions of the system in each country. Chapter 3 describes international comparisons of data on vocational education between countries; the contextual and programmatic differences between countries; some key indicators that one would want to compare across vocational systems; the data that international organizations have compiled regarding these indicators; the degree to which these key comparisons can be made using existing data; and the data improvements that would be necessary to prepare all of these key indicators. Appendix A describes surveys and studies in each G-7 country that contain information pertinent to assessments of vocational education and training programs and student labor force outcomes. Although these data sets represent rich analytical opportunities, the results of these surveys would not necessarily be comparable from country to country. Finally, Appendix B reports the sources of vocational education data that were identified during the course of this study. Given that many ministries and government agencies are involved in vocational education and training efforts in every G-7 country, this list may prove useful to others working on related comparative issues.

Chapter 2

Systems of Vocational Education and Training

The years immediately following compulsory education are a stage of transition—between basic schooling and higher education for some and between school and work for many. In the most developed countries, youths can take advantage of an array of upper secondary and postsecondary educational and training options that include a bewildering mosaic of schools, training institutions, business training, and apprenticeship programs.

This chapter describes the vocational education and school-related training programs in each of the G-7 countries, with a focus on options that are school based at least to some degree. The many programs offered in the United States and other countries by ministries of labor or social affairs, for instance, are not discussed in any detail. The common thread here is how programs are linked to school. The reasons for restricting these narratives in this way are both practical and strategic—practical in order to bound the inquiry, and strategic in order to present differing institutional structures across countries in a more uniform fashion.

From country to country, the nature of vocational education and training reflects deep cultural roots, national predispositions, and historic traditions. Vocational program strategies are closely linked to the priorities of each national educational system.

> These systems cannot simply be transplanted from one society to another. The strong social valuation of the craft traditions helps to explain why Germans chose to develop apprenticeship. . . . With the highly structured and all-encompassing nature of French formal education, vocational training naturally gravitated to it. The egalitarian values of American society underscore the preference for keeping students in the same school and offering vocational subjects to those who want to pursue them (Alkin 1992, 1515).

In some G-7 countries, vocational education and training rests largely with the schools, which have acquired responsibility for teaching practical subjects and providing formal job preparation. In other G-7 countries, the predominant training and apprenticeship systems are employer based. While some countries have elaborate systems of formal vocational credentialing in place, others do not. In some countries, participating in vocational preparation is highly respected; in other countries, vocational education is viewed as decidedly inferior to academic preparation.

This chapter describes the nature of vocational education and training opportunities at the upper secondary level and beyond, emphasizing programs that fall under the jurisdiction of education ministries. The first part of the chapter offers brief descriptions of the vocational education systems in each G-7 country (pages 7–13) for readers who do not need an in-depth description. The remainder of the chapter contains extensive narratives for each vocational education system for readers who want more detailed information.

Generally, these narratives focus on school-based vocational preparation and training, understanding that such discussions may miss programs for youth who have left school, or for those who pursue other kinds of training alternatives. The narratives generally focus on what the vocational system looked like during the most recent year for which data are available. The narratives also tend to focus on the most common ways of obtaining vocational skills; they are not intended to exhaustively detail all the methods of training in each country. For the most part, the narratives are organized in a parallel fashion. However, differences among educational systems inevitably necessitate different approaches, emphases, and descriptive strategies from country to country.

Vocational Education in Canada
Summary

Canadian provincial and territorial governments are solely responsible for education within each of the ten provinces and two territories. Thus, in Canada there are essentially 12 different and autonomous systems of education. Compulsory education begins at age 5 or 6 and lasts until age 15 or 16, varying across the provinces. The central government does not set national education goals or mandate a standardized curriculum. But despite decentralization and autonomy, provincial education systems share some common characteristics. Education systems consist of three levels: elementary education (serving students aged 5 or 6 to 11 or 13); secondary education (serving students aged 12 or 14 to 18); and postsecondary and higher education. Most public secondary schools are comprehensive. However, in large cities, there are some vocational and occupational secondary schools. At the postsecondary level, universities offer degree programs, and community colleges offer certificate and diploma programs in both vocational and academic subjects.[1]

While the organization of vocational education differs among provinces, vocational education programs are primarily postsecondary options that are mainly available in community colleges. Postsecondary vocational programs can be classified as either short- or long-term programs. The short-term programs, usually not exceeding 1 year,[2] focus on entry-level job preparation and basic skills. These programs usually include little or no academic coursework and lead to certificates of completion. Long-term programs, usually 2 to 3 years in duration, lead mainly to a diploma.

In 1991, 6 percent of 18-year-olds, 10 percent of 19-year-olds, and 10 percent of 20-year-olds were enrolled full time in a long-term postsecondary vocational program. Over the past two decades, the number of young people attending long-term vocational programs has grown along with the overall growth in postsecondary enrollments. However, the proportion of community college students enrolled full time in vocational programs as opposed to university transfer programs has changed little.

After declining from 1984–88, total participation in short-term postsecondary vocational programs (not including apprenticeships) increased by 8 percent from 1989 to 1991. In addition, participation in registered apprenticeship programs increased by 26 percent from 1988 to 1990–91. In 1991–92, 58 percent of those who entered a short-term vocational program successfully completed it. It is estimated that two-thirds of registered apprentices complete their program and receive a qualification, and of these completers, approximately 40 percent receive a "Red Seal" qualification. A "Red Seal" is a qualification recognized throughout Canada that allows its holder to practice that trade in any province. The job placement record of apprenticeship completers is fairly high. Of those who completed an apprenticeship program, 96 percent held a job in their trade area during the first year after the program.

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[1] In Canada, community colleges encompass a wide variety of postsecondary nondegree-granting institutions. These institutions may offer academic (university-transfer) programs, vocational and trade programs, or both.

[2] The exception are apprenticeship programs that may last between 1–5 years.

Vocational Education in France
Summary

The French educational system consists of five levels: 1) preschool; 2) primary school (grades 1–5); 3) lower secondary school (grades 6–9); 4) upper secondary/high school (grades 10–12); and 5) higher education. Compulsory education extends from age 6 to 16. There is a range of widely recognized national certificates and qualifications associated with differing levels of academic and vocational attainment. Students begin preparing for the qualifying exams for these certificates and qualifications after grades 6 and 7.

In grades 8 and 9, students who are not preparing for postsecondary education have the option of entering a technological curriculum. Students may begin study for an entry-level Vocational Aptitude Certificate (CAP) while in lower secondary education; for these students, the CAP takes 3 years. Students who have completed lower secondary education can earn a 2-year CAP. The CAP is a specialized diploma awarded for skill in one of over 200 trades, and requires full-time general and vocational coursework, including on-the-job training. Alternatively, students with a lower secondary diploma can enroll in the less specialized 3-year program in order to prepare for a Vocational Studies Certificate (BEP). Rather than being awarded in a specific trade, the BEP is awarded for skills required in one professional, industrial, commercial, administrative, or social sector. There are 40 to 50 BEP specialties.

At the upper secondary level, vocational programs are offered by several types of institutions: vocational high schools, general or academic high schools, and apprentice training centers. In 1991–92, 71 percent of upper secondary students were enrolled in general or academic programs, and 30 percent in vocational–technical programs. Among those students pursuing vocational studies at the upper secondary level, 69 percent were enrolled in a program leading to a BEP certificate.

Within vocational high schools, students can prepare for either a CAP or a BEP certificate or a vocational high school diploma (BP). Both CAP and BEP certificates are designed to prepare students for skilled blue- and white-collar jobs. The program leading to the BEP requires a lower secondary diploma, and coursework usually takes between 2 and 3 years to complete. The BEP prepares students for middle-level or supervisory positions. Students who receive high marks on the BEP examination can transfer to the second year of a general or academic high school to pursue a technical high school diploma (BT) or a technical high school certificate (BTn). The BP requires a minimum of 4 years of vocational studies (including a 2-year BEP). BP students are required to spend 12–24 weeks working in their field of study with an "in-firm" trainer. The degree is designed to lead students directly into skilled white- or blue-collar jobs.

In 1989, the equivalent of 11 percent of all full-time upper secondary students participated in an apprenticeship program. An apprenticeship contract can last from 1 to 3 years; the length of the contract depends upon the profession and the qualification an apprentice [illegible]s to achieve. Apprenticeships can prepare students for vocational or technological education certificates at both the secondary and upper secondary levels.

Vocational Education in Germany[3]
Summary

Responsibility for elementary and secondary education in (former) West Germany rests mainly with the 11 federal states, although they all share a common educational structure. Compulsory education begins at age 6 and lasts 12 years until age 18. Students are required to attend school full time for 9 years. During the last 3 years (or until an apprenticeship is completed), students are only required to attend school part time. Beginning in grade 5, students are tracked into one of four different types of lower secondary schools: general, intermediate, grammar or academic, or comprehensive. Since 1976, the first 2 years of lower secondary curricula (grades 5 and 6) have been standardized across all schools, enabling students to transfer among the three types of schools.

In 1991, 30 percent of lower secondary students (age 10 to 15) attended general lower secondary schools; 25 percent attended intermediate lower secondary schools; 31 percent attended academic or grammar secondary schools; 7 percent attended comprehensive lower secondary schools; and 6 percent were enrolled in a prevocational (career exploration) program that was independent of a lower secondary school.

Vocational education and training begins at the upper secondary level (age 15 to 18 or 19). In 1991, 74 percent of all upper secondary students were enrolled in a vocational education program. Students can pursue vocational education through full-time or part-time vocational schooling or through the dual system. The dual system is a partnership between industry and the government that is designed to provide young people with supervised on-the-job training supported by part-time general and vocational instruction.

More upper secondary students are involved in the dual system than in any other educational program. In 1986, 57 percent of 16- through 18-year-olds were participating in the dual system, compared with 23 percent of students in this age group who were enrolled in a full-time or part-time vocational program only and 21 percent who were enrolled in grammar school at the upper secondary level. Apprentices and employers enter into a written contract, defining the responsibilities of each party, the duration of the apprenticeship, and the wages to be paid. Employers release apprentices during the week or give them blocks of time so that they can attend vocational school or classes to fulfill the compulsory school requirement. Students who successfully complete dual-system training emerge with journeyman or skilled worker certificates. The duration of apprenticeships varies from 2 to 3.5 years.

The largest proportion of students in the vocational education system attend part-time vocational schools. This is because these schools are the major provider of in-school training for the dual system. It is estimated that approximately two-thirds of lower secondary school completers directly enter the dual system, and 90 percent of young people who complete lower secondary school eventually participate in dual-system training.

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[3]This summary describes the educational system of the former West German Republic.

Vocational Education in Italy
Summary

In Italy, students are required to attend school for 8 years from age 6 to 14, and the compulsory education system includes elementary grades 1 through 5, and lower secondary grades 6 through 8. Despite periodic reforms, the education system has remained quite centralized at all levels. During the compulsory grades, students follow a national standardized academic curriculum.

Upper secondary education includes a broad array of institutional types—academic schools, art institutes, technical schools, and vocational schools. Vocational education and training begins after compulsory education. Within the education system, there are upper secondary vocational and technical schools administered by the State Ministry of Education. In 1987–88, 81 percent of lower secondary graduates entered upper secondary school, and 71 percent of these students enrolled in vocational and technical schools. Outside the education system, there are other vocational options funded by the Ministry of Labor and administered by regional governments. Three of these options—apprenticeships, training–work contracts, and basic vocational training—are targeted at young people beyond compulsory schooling age.

Technical Schools: In 1989–90, nearly 47 percent of upper secondary school students attended one of nine types of technical schools. Technical school programs are 5 years in duration. During the first 2 years, the curricula are fairly similar to upper secondary classical academic education. During the last 3 years, while the curricula still contain some general education, the focus is mostly on the student's area of technical concentration. Upon completion of the 5-year program, students sit for an upper secondary technical school diploma examination. The diploma enables a student to enter intermediate-level employment in the public and private sectors or in higher education.

Vocational Schools: In 1989–90, 19 percent of upper secondary students attended one of five types of vocational schools. These vocational programs are tightly matched to labor market requirements and entry qualifications in each sector, and curricula are based upon industry requirements. Programs usually last 2 to 3 years and are designed to train specialized workers in certain occupational areas. In order to obtain a qualifying certificate, students must take an examination testing both general education skills and knowledge in the occupational area of study. The qualification certificate allows a student to enter the 4th year of the new 5-year vocational program or a 2-year specialized vocational training course, but not a university or institution of higher education.

The students in vocational and technical schools are in addition to youth who participate in vocational training outside the education system. In 1987–88, 12 percent of lower secondary school graduates entered apprenticeships or regional vocational training programs; 35 percent entered technical schools; and 22 percent entered vocational schools.

Of the 1.3 million young people participating in nonschool-based vocational programs, 43 percent were apprentices; 39 percent held training–work contracts; and 18 percent were enrolled in vocational training courses.

Vocational Education in Japan
Summary

Japan has a centralized educational system characterized by a uniform, substantially academic curriculum. Japanese schools operate on the 6-3-3-4 model: 6 years of elementary school, 3 years of middle school, 3 years of high school, and 4 years of postsecondary education. The first 9 years of elementary and middle school are compulsory. During these years, students are not grouped by ability, and they attend schools assigned to them based on their place of residence. At the high school level, schools play a major role in placing students in the work force and postsecondary schools.

Vocational education is predominantly a postcompulsory activity. Formal entry-level and advanced-level training programs are offered within upper secondary and postsecondary schools through Department of Labor employment training programs and within businesses. In addition, private businesses play a strong role in providing training.

Vocational training occurs in two types of schools: high schools (comprehensive and vocational), and miscellaneous schools (vocational training schools), which offer specialized training in one or more occupational areas. Over the past decade, the overall proportion of high school students pursuing studies in an occupational field has decreased slightly from 32 percent in 1980 to 26 percent in 1989.

Miscellaneous schools offer both entry-level (upper secondary) and advanced-level (postsecondary) vocational programs in specific occupational fields, providing a type of training not available in high schools and universities. Training is often fairly specific and aimed at preparing students for national licensing examinations. The majority of these schools offer only advanced-level (postsecondary) programs, and most are private. In 1990, 77 percent of the students enrolled in miscellaneous schools were taking advanced courses, and 88 percent of these schools were private. These schools enroll approximately one-third of all upper secondary graduates.

Special training schools, a type of miscellaneous school, have programs that must be at least 1 year in duration, whereas other miscellaneous schools have programs that generally last from several weeks to a year. Although there are special training schools at the upper secondary level, most of these schools offer postsecondary programs: 75 percent of students in special training schools are enrolled at the postsecondary level. Upper secondary special training schools offer 3-year programs to lower secondary school graduates, while special training colleges (advanced-level special training schools) offer 2-year postsecondary vocational programs to high school graduates.

The Ministry of Labor operates public training centers that offer basic training, skill improvement training, programs offering retraining for new occupations, and instructor training. Most students in these centers are older workers who want to acquire a national trade certificate or train for new jobs. In addition, approximately 150 vocational schools are operated by other ministries.

Vocational Education in the United Kingdom[4]
Summary

Compulsory education in England and Wales spans 11 years for students, from age 5 until age 16. The education system is highly decentralized, with responsibility for management and control resting mainly with the local education authorities (LEAs). Most LEAs adopt two-tiered grade-level configurations, consisting of 6 years of primary school and 5 years of lower secondary school. Approximately 90 percent of secondary students attend nonselective, comprehensive secondary schools. The remaining students attend selective schools: grammar schools (for university preparation), private institutions, grant-maintained schools, or secondary technical schools (for transition to work).

Vocational education and training are available to students at age 16. Programs are offered both within the educational system, through institutions of further education, and outside the system. (In England and Wales, postcompulsory education consists of further and higher education. Further education takes place at the secondary and postsecondary levels and includes both academic and vocational programs. These programs reach standards equivalent to A-level or a BTEG National Diploma or Certificate. Higher education encompasses all coursework, leading to standards above these qualifications.) For the most part, institutions of further education offer programs that prepare students for vocational qualification examinations. However, they also provide some academic programs that prepare students for university-qualifying examinations. In 1989–90, 15 percent of students aged 16–18 were enrolled in further education, with a majority of full-time further education students preparing for vocational qualifications.

There are several vocational training programs outside the education system. For example, the Department of Employment administers Youth Training (YT), an apprenticeship program available to all 16- and 17-year-olds who are not enrolled in school. YT apprenticeships lead to National Vocational Qualifications. In addition, trade guilds operate apprenticeship programs, and some of the larger corporations and businesses provide on-the-job training.

In England and Wales, a number of government agencies and some professional organizations offer vocational certificates designed to parallel the academic certification system. Within this system, however, no single body confers a certificate that is predominant.

In 1992–93, 25 percent of 16-year-olds, 20 percent of 17-year-olds, and 11 percent of 18-year-olds in the United Kingdom were enrolled in full-time vocational education. In 1990, 15 percent of 16- to 18-year-olds were enrolled in Youth Training Schemes (YTS), the predecessor to YT. Data show increasing participation in full-time education. In 1987, 41 percent of 16-year-olds were enrolled full time in school, compared with 58 percent of 16-year-olds in 1991. However, the participation of 16-year-olds in YT (or previously YTS) declined from 1987 to 1991.

[4]The various education authorities within the United Kingdom differ in the way they structure their education and training systems and the way they collect education data. This narrative focuses on England and Wales, except when noted.

Vocational Education in the United States
Summary

Compulsory education requirements vary across the decentralized, state-run systems in the United States, but generally run from around age 6 to 16. There are various grade-level patterns in schools, two of which are particularly common: kindergarten plus 6 years of elementary school, followed by 3 years of junior high school, and 3 years of high school; or kindergarten plus 4 or 5 grades, a 3- or 4-year middle school, and a 4-year high school. The vast majority of students attend publicly supported nonselective schools, while about 10 percent of elementary and secondary students attend private institutions, mostly run by religious denominations.

Vocational education is an integral part of the larger education system in the United States, spanning secondary and postsecondary levels and public and private sectors. Secondary vocational education is offered in grades 7 through 12, chiefly through the public school system. Secondary students are not generally placed in strict tracks, as is the case in other countries. Instead, they are able to explore various curricula in both vocational and academic education. A unique aspect of the vocational education system in the United States is that it provides students with a second chance—that is, the opportunity to change the course of their education from academic to vocational or vice versa. The number and type of vocational course offerings vary by district and even by school. However, general vocational courses (e.g., industrial arts, home economics) are usually taught throughout the secondary years, while occupationally specific courses are generally reserved for grades 10 through 12.

At the secondary level, public vocational education is delivered through several different institutional arrangements. The most common types include comprehensive high schools, area vocational schools, and full-time vocational high schools. Comprehensive high schools offer both academic and vocational courses, and serve students who have a broad range of academic and career goals. The vast majority of instruction in vocational education takes place in comprehensive high schools, although most of these schools focus on preparing students to pursue an academic postsecondary degree after high school. Area vocational schools provide a centrally located vocational facility and are shared by two or more sending high schools. Students attend the area vocational school for part of the day in order to receive their vocational education, while pursuing their academic studies at their home high school. Full-time vocational high schools offer a complete program of academic and vocational studies with a focus on vocational coursework.

Postsecondary vocational programs generally lead to an associate degree or certificate. Private, for-profit schools offer a variety of vocational programs generally ranging from very short certificate programs (6 weeks, for example) to 2-year associate degree programs. Public 2-year institutions typically offer 2-year associate degree programs and certificate programs. Public vocational–technical institutes generally do not award associate degrees and are more likely to provide certificate programs lasting 1 year or less. Public 2-year institutions generally offer programs of study in both academic and vocational areas, while vocational–technical institutes and private, for-profit schools almost exclusively offer vocational education.

In 1987, about 98 percent of all public high school graduates completed at least one course in vocational education during their high school careers. About one-third of all 1987 public high school graduates completed the equivalent of four courses in any vocational area that met for one period per day for 1 year. In the fall of 1990, about 6 percent of the entire U.S. population aged 18–34 were taking vocational courses. Almost one-half of these students were studying at public 2-year colleges.

Vocational Education in Canada

Canadian provincial and territorial governments are solely responsible for education within each of the ten provinces and two territories. Thus, within Canada there are essentially 12 different and autonomous systems of education. In this narrative, a general countrywide description is provided, and when available, countrywide data are presented. However, in order to capture the distinctive qualities and differences between the provincial system of education and training, this narrative describes in detail the vocational education systems in the three most populous provinces.

Compulsory education in Canada begins at age 5 or 6 and lasts until age 15 or 16, varying across the provinces. The central government does not set national education goals or mandate a national standard curriculum. But despite decentralization and autonomy, provincial education systems share some common characteristics.[5] Education systems consist of three levels: elementary education (serving students ages 5 or 6 to 11 or 13); secondary education (serving students ages 12 or 14 to 18); and postsecondary and higher education. In addition to public elementary, secondary, and postsecondary institutions, there are a variety of special schools including private and proprietary schools and schools for Indians and Innuit. Within each province, public education is administered by the Ministry of Education.

Most public secondary schools are comprehensive. However, in large cities there are some vocational and occupational secondary schools. At the postsecondary level, universities offer degree programs and community colleges offer certificate and diploma programs in both vocational and academic subjects.[6]

Organization of Vocational Education

While the organization of vocational education differs among provinces, vocational education programs are primarily postsecondary options that are mainly available in community colleges. Currently, however, there is a movement within secondary education to create linkages between school and work or postsecondary education and to strengthen secondary vocational programs.

Postsecondary vocational programs can be classified as either short- or long-term programs. The short-term programs, usually not exceeding 1 year,[7] focus upon entry-level job preparation and basic skills. These programs usually include little or no academic coursework in the curriculum and lead to certificates of completion.[8] Long-term programs, usually 2 to 3 years in duration, lead mainly to a diploma.[9] Both short- and long-term programs are usually provided in community colleges.

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[5]National organizations, such as the Canadian Education Association, share information on education issues which has led to some uniformity across provinces. As part of the Council of Ministers of Education, Canada, the ministers of education from each province and territory meet regularly to share information and undertake joint projects.

[6]In Canada, community colleges encompass a wide variety of postsecondary nondegree-granting institutions. These institutions may offer academic (university-transfer) programs, vocational and trade programs, or both.

[7]The exception are apprenticeship programs that may last between 1–5 years.

[8]These programs are often referred to as vocational and trade programs.

[9]These programs are often referred to as career--technical programs.

Short-term vocational programs include preemployment and preapprenticeship programs, registered apprenticeship programs, prevocational academic upgrading programs, skill upgrading programs, basic job readiness training programs, vocational orientation programs, and special training programs.

- **Preemployment or preapprenticeship vocational programs** provide, on average, 40 weeks of entry-level skill training in a particular occupational area or prepare students to enter an apprenticeship program.
- **Registered apprenticeship programs** combine work experience with short periods of classroom instruction on a technical subject. Approximately 80 percent of apprenticeship training occurs on site. Apprenticeships last between 1–5 years depending upon the trade.
- **Prevocational academic upgrading or basic training for skill development programs** are designed to enhance the math, science, and communication skills of students to prepare them for entry into a training program or for employment. The duration of participation depends upon the students' skills upon entry.
- **Skill upgrading programs** are designed to keep workers up-to-date on new advances in their fields. Programs range from 2 to 20 weeks in duration.
- **Basic job readiness training programs** have multiple components and are designed for people wanting to enter or reenter the labor force. The program combines basic academic refresher courses with job readiness skills and career exploration. These programs vary from 8 to 40 weeks in duration.
- **Vocational orientation programs** are career exploration programs designed to assist students in selecting an occupational area. Programs vary from 8 to 12 weeks in duration.
- **Special training programs** are industry-specific training programs customized to train workers for specific industry needs. The duration of training is usually short.

Vocational Education in Selected Provinces

Because education is a provincial responsibility, education and vocational training systems differ among provinces. The following section describes vocational training systems in the three largest provinces, British Columbia, Québec, and Ontario, where 74 percent of Canada's population live (Statistics Canada and the Council of Ministers of Education 1990). These brief narratives serve as examples of training systems in Canada and show the variation among provinces.

British Columbia

In British Columbia, there are no provincial vocational or technical training programs at the elementary and secondary school level. However, local school districts have developed their own career preparation programs. To receive funding from the province, the programs must be approved by the Board of Education and must include either a work-experience component or a preapprenticeship class. In 1992–93, 90 percent of school districts had programs operating in their

district; 59 percent of all schools offered programs; and approximately 20 percent of 11th and 12th graders participated in these programs.[10]

At the postsecondary level, students can pursue vocational training in a work setting through apprenticeships or within the education system in colleges. Apprenticeships lead to trade qualifications, and occupational programs in colleges lead to college diplomas.[11] Students with college diplomas can pursue a 1-year advanced training program in an occupational subject. In 1989–90, 21 percent of students in colleges in British Columbia were enrolled in occupational programs (Ministry of Advanced Education, Training, and Technology 1990).

In British Columbia, 78 percent of college graduates in occupational fields were employed 9 months after graduation. Of those graduates who were seeking jobs (either unemployed or employed), 91 percent had held a training-related job in the first 9 months following graduation (Ministry of Advanced Education, Training, and Technology, *College Student Outcome Report* 1991).

Québec

In Québec, vocational programs are offered at both the secondary and postsecondary level. Following compulsory education (after age 16), students have two vocational program options within comprehensive high schools. The longer program, averaging 1,350 hours of vocational training, leads to a secondary school vocational diploma. In this program, students are prepared for highly skilled trades that require theoretical knowledge and manual skills. Currently, there are 38 programs leading to a secondary school vocational diploma, ranging from accounting to programs in allied health fields and automotive mechanics. The shorter program, usually providing less than 900 hours of vocational training, leads to a secondary school vocational certificate. The emphasis in this program is on providing students with the manual skills required for a specific trade occupation. There are 12 vocational programs, ranging from home health aides to roofing and restaurant services, that lead to a secondary school vocational certificate (Ministère de l'Éducation, *1992–1993 Program Catalogue* 1992). Students with vocational diplomas and certificates can register for additional training in a related field and receive an "Attestation of Vocational Specialization." Only a small proportion of students take vocational training at the secondary level. In 1991–92, of the students who completed the last year of secondary school or the 11th grade, only 5 percent entered a vocational program.

At the postsecondary level, 3-year vocational programs are offered along with 2-year academic (pre-university) programs at community colleges.[12] Students must possess a secondary school certificate or a secondary school vocational diploma to enter these programs, but those without a diploma may be conditionally admitted, provided they pass certain courses. Technical or vocational programs usually last 3 years and lead to a diploma of college studies. The curricula of these programs involve both coursework in the occupational area as well as general study core courses. In addition, there are some shorter term programs leading to certificates in vocational areas offered within the colleges that have less strict entrance requirements and little or no general education core requirements.

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[10]Telephone interview with Velma Haslin, British Columbia Department of Education, May 25, 1993.

[11]Canadian colleges are similar to community colleges in the United States. They offer 2-year programs in occupational and academic subjects serving both an occupational training and a university-transfer function.

[12]Québec community colleges, referred to as comprehensive colleges of general and vocational education (CEGEP), are unique in that they are a required step in the higher education process. Students wishing to enroll in a university must complete a 2-year academic program at a CEGEP.

Ontario

In Ontario, 10th-grade students choose a "stream." There are three types of streams: 1) advanced or college prep (80–90 percent of students choose this stream while fewer than 20 percent go on to a university); 2) general—this stream emphasizes the application and acquisition of skills and prepares students for community colleges; and 3) basic—this stream is for students interested in working directly after high school and emphasizes life skills and personal skills.

At the secondary level, students may take vocational courses as electives in high school. Even in districts where there is a vocational high school, students must take the general core curriculum, enrolling in vocational courses as electives. Two programs are offered at the secondary level that expand vocational education opportunities. The first is a program linked to the community colleges. Students participating in this program fulfill their general requirements at the high school but take electives at a nearby community college. The second program is the secondary school workplace apprenticeship program, which allows secondary students to enter into an apprenticeship as long as they complete their core curriculum requirements. However, as in the other provinces, vocational programs are primarily postcompulsory and are offered within Ontario's community college structure.

Participation in Vocational Education and Student Outcomes

In 1991, 6 percent of 18-year-olds, 10 percent of 19-year-olds, and 10 percent of 20-year-olds were enrolled full time in a long-term postsecondary vocational program (data from Statistics Canada, September 1993). Over the past two decades, the number of young people attending long-term vocational programs has grown along with the overall growth in postsecondary enrollments. However, the proportion of community college students enrolled full time in vocational programs as opposed to university-transfer programs has changed little. In 1970–71, 71 percent of community college students participated in a long-term vocational program; in 1991, 68 percent of community college students did so (Council of Ministers of Education, Canada, February 1993).

After declining from 1984 to 1988, total participation in short-term postsecondary vocational programs (not including apprenticeships) increased by 8 percent from 1989 to 1991. Participation in registered apprenticeship programs followed a similar pattern: the numbers of participants rose in recent years after declining from 1984 through 1988 (Council of Ministers of Education, Canada 1993).[13] In 1987–88, nearly 48,000 people participated in registered apprenticeships, while in 1990–91 there were more than 60,000 apprentices, an increase of 26 percent. The short-term postsecondary vocational programs that attracted the most participants were preemployment programs (30 percent of short-term postsecondary vocational program participants); programs for registered apprentices (23 percent); and prevocational academic upgrading courses (19 percent) (data from Statistics Canada, October 1993). About 60 percent of short-term vocational program participants were enrolled in programs that lasted less than 30 weeks; the rest were enrolled in programs that were 30 weeks or more in duration.

In 1991–92, 58 percent of those who entered a short-term vocational program successfully completed it. In 1988, the median annual earnings of 1986 career–technical graduates were $22,000; however, trade–vocational graduates tended to earn less. In 1988, the median earnings of 1986 trade–vocational graduates were $19,000 (table 2.1).

[13]Declines in apprenticeships have not been even across fields of study. Between 1984–85 and 1989–90, a large decline in participation was seen in the welding trade (22 percent), whereas the number of registered apprentices in cooking increased 34 percent (Council of Ministers of Education, Canada, February 1993).

Table 2.1—Estimated median annual earnings of 1986 trade–vocational graduates (short programs) and career–technical graduates (long programs) working full time, by field of study: 1988

	Short-term programs: Trade–vocational graduates Median earnings ($ Canadian)	Long-term programs: Career–technical graduates Median earnings ($ Canadian)
Field of study:		
Total	**$19,000**	**$22,000**
Arts	13,000	18,000
Business and Commerce	16,000	19,000
Engineering and Applied Sciences	21,000	23,000
Mathematics and Computer Science	21,000	23,000
Health Sciences and related	20,000	27,000
Humanities related	—	17,000
Natural Sciences and Primary Industries	20,000	21,000
Social Sciences and Services	18,000	20,000

—Not applicable.

SOURCE: Warren, Clark, *The Class of 86: A Compendium of Findings* (Ottawa: Employment and Immigration Canada, 1991).

Approximately two-thirds of registered apprentices complete their program and receive a qualification, and of these completers about 40 percent receive a "Red Seal" qualification. This qualification is recognized throughout Canada and allows its holder to practice that trade in any province (Employment and Immigration Canada and Statistics Canada 1990). The job placement record of apprenticeship completers is fairly high. Of those who completed an apprenticeship program:

- 96 percent held a job in their trade area during the first year after the program;
- 90 percent held jobs in their trade area 2 and 3 years after the program; and
- 85 percent of those with jobs in their trade area were employed at the journey level (Employment and Immigration Canada and Statistics Canada 1990).

Vocational Education in France

The French educational system consists of five levels: 1) preschool (ages 2 to 5);[14] 2) primary school grades 1–5 (ages 6 to 10);[15] 3) lower secondary school grades 6–9 (ages 11 to 14);[16] 4) upper secondary/high school grades 10–12 (ages 15 to 18);[17] and 5) higher education.[18] Compulsory education extends from age 6 to 16 (through lower secondary school for most students). Upon completion of high school, students receive a national high school diploma.[19,20] In 1986, 33 percent of young people aged 16–25 were enrolled in school, and 36 percent were employed. The remaining young people were either unemployed, enlisted in the military, or engaged in training programs such as apprenticeships and government-sponsored training programs (table 2.2). The proportion of enrollments by school level and curriculum is described in figure 2.1.

Table 2.2—Percentage distribution of young people aged 16–25 in France, by current education or employment status: March 1986

	Percent
16- through 25-year-olds by education and employment status	
Students	33.1
Apprentices	2.5
Employed	36.1
Military service	2.9
Participating in government-sponsored training and employment program	5.6
Other*	18.9

*Other includes young people who are unemployed or not in the labor force.

NOTE: May not sum to 100 percent due to rounding.

SOURCE: Data drawn from "INSEE Economie et Statistique," Nr. 193/194 (Nov/Dec 1986), in CEDEFOP, *Vocational Education in France: Structural Problems and Present Efforts Towards Reform* (Berlin: 1989), 16.

[14]Students can attend preschool (*École Maternelle*) until the age of 6 when they begin compulsory education. One hundred percent of 5-year-olds attend preschool.

[15]*École Primaire.*

[16]Middle school (*Collège*) lasts 4 years (grades 6 through 9), and consists of two 2-year stages: 1) the observation stage (*cycle d'observation*); and 2) the orientation stage (*cycle d'orientation*). During the orientation stage, special prevocational classes are available. About 30 percent of students take this option (Postlethwaite 1988).

[17]There are two types of high schools: 1) the general high school (*Lycée*) (grades 10 through 12) that offers both technical and academic programs leading to a technical or general baccalaureate; and 2) the vocational high school (*Lycée Professionnel)* that provides several vocational programs leading to an entry-level vocational certificate, an upper secondary vocational diploma, or a vocational baccalaureate.

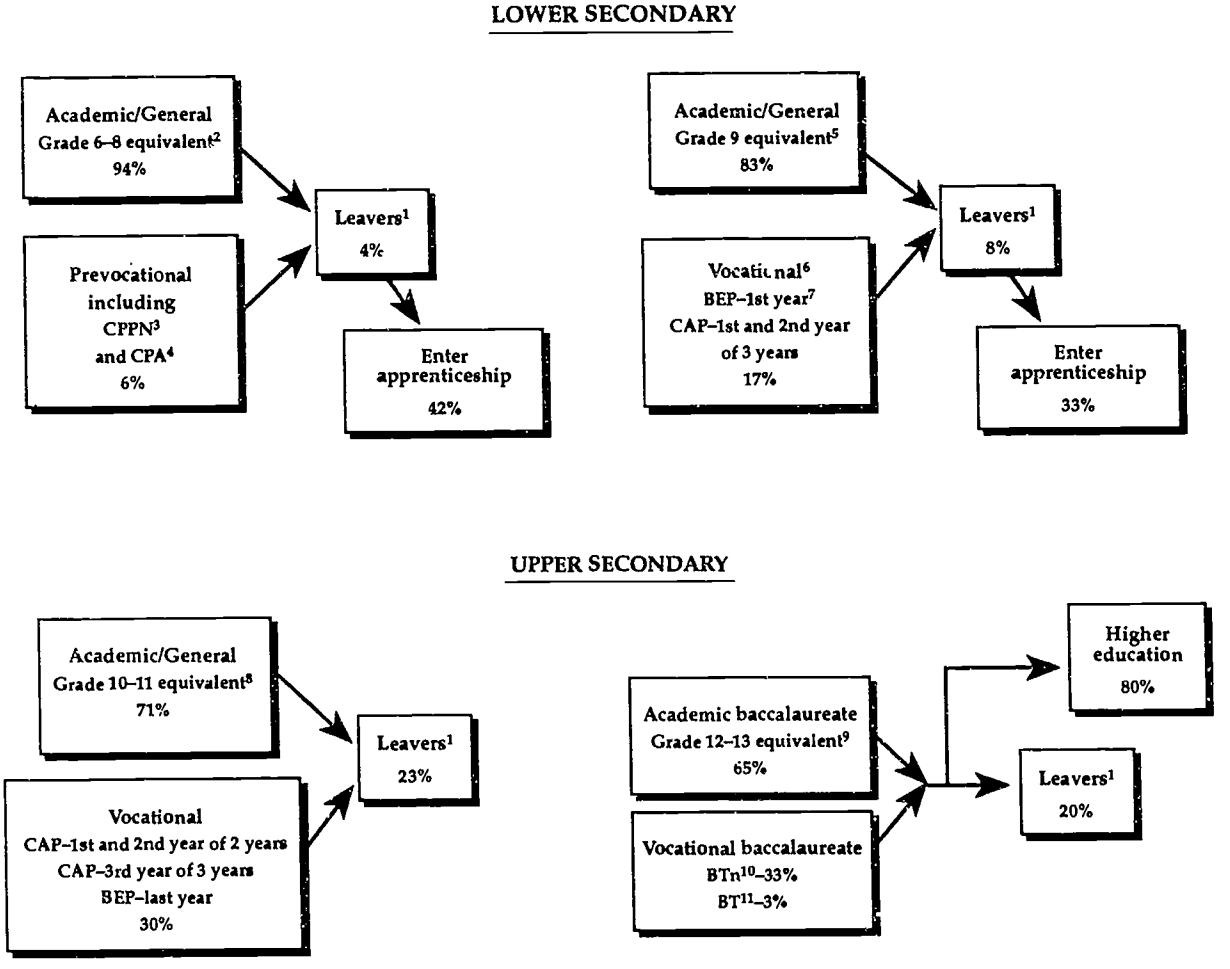
[18]Students can either take a short course of advanced technological education that lasts 2 years or enroll in a long course of study at a university that can take from 3 to 7 years.

[19]*Brevet.*

[20]If students do not repeat any grades, they are required to attend at least 1 year of high school (i.e., until they reach postcompulsory age). In 1984, approximately 25 percent of students repeated one grade, and 9 percent repeated more than one grade (Postlethwaite 1988).

Figure 2.1

FRANCE: Proportion of enrollments by school level and curriculum, and flows out of the education system at each school level: 1985



[1]Estimation of number enrolled at beginning of school year 1984–85, compared with number reenrolling at beginning of school year 1985–86.
[2]Sixième, Cinquième, Quatrième *(Collèges)*.
[3]Lower secondary prevocational program *(Classe Pre-Professionnelle de Niveau)*.
[4]Lower secondary preapprenticeship program *(Classe Preparatoire à l'Apprentissage)*.
[5]Troisième *(Collèges)*.
[6]The first year of the entry-level vocational certificate (CAP) and entry-level occupational certificate (BEP) programs are considered lower secondary; from the second year, coursework is considered upper secondary.
[7]Although classified as lower secondary, most BEP students have attained upper secondary status when they begin study toward this diploma.
[8]Deuxième, Première Generale *(Lycée)*.
[9]Terminale.
[10]Technical high school certificate *(Brevet de Technicien)*.
[11]Technical high school diploma *(Baccalauréat Technicien)*.

SOURCE: L'Institut Nationale de la Statistique et des Études Économiques (INSEE), *Bilan Formation-Emploi*, No. 251 (June 1988).

There is a range of widely recognized national certificates and qualifications that certify different levels of academic and vocational attainment. Students begin preparing for the qualifying exams for these certificates and qualifications after the "observation stage" of lower secondary school (sixth and seventh grades). Placement in an academic track at this point requires selection by school counsels (administrators, teachers, parents, students, and guidance counselors). Students who are not selected to pursue academics are effectively tracked into vocational programs. In the eighth grade, students can enroll in prevocational studies leading to an entry-level vocational certificate.

Clear divisions exist between school-based and nonschool-based vocational education and training. In-school vocational programs are the responsibility of the Ministry of Education; nonschool training programs fall under the jurisdiction of the Ministry of Labor, with support from the National Vocational Training Delegation and Regional Vocational Training Delegations.

Vocational Education Options Within the Educational System

Lower Secondary School Options[21]

In the last 2 years of lower secondary school (eighth and ninth grades), students have several vocational options. Within lower secondary schools, students can participate in a prevocational program (CPPN),[22] or they can enroll in a preapprenticeship program (CPA).[23] These programs involve part-time general and vocational studies along with part-time on-the-job training. However, they are considered marginal options for students and will soon be phased out.[24] Instead, students have the option of taking an alternative technological curriculum within a lower secondary school or a vocational high school.[25] These students may begin study while in lower secondary for an entry-level Vocational Aptitude Certificate (CAP).[26] For these students the CAP takes 3 years. Students with a lower secondary diploma can earn a 2-year CAP at the upper secondary level.[27] The CAP is a specialized diploma awarded for skill in one of over 200 trades. A lower secondary diploma qualifies a student to enter a program in a vocational high school leading to an upper secondary Vocational Studies Certificate (BEP).[28] The 3-year BEP program is less specialized than the CAP. It is awarded for vocational skills not in a specific trade, but in a professional, industrial, commercial, administrative, or social sector. There are 40 to 50 BEP specialties.

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[21] *Collège.*

[22] *Classe Pre-Professionnelle de Niveau* (CPPN).

[23] *Classe Préparatoire è l'Apprentissage* (CPA).

[24] In general, the lowest 20 percent of academic performers (not including those in special education courses) were tracked into these prevocational programs.

[25] *Lycée Professionnel.*

[26] *Certificat d'Aptitude Professionnelle* (CAP).

[27] *Brevet des Collèges.* Parents often prefer the alternative technological curriculum within middle schools. Although it is the same curriculum, most parents want to avoid having their children labeled as "vocational."

[28] *Brevet d'Enseignement Professionnelles* (BEP). Both the CAP and BEP are terminal secondary degrees. Some students, however, receive a CAP prior to earning a BEP.

Upper Secondary School Options

At the upper secondary level, vocational programs are offered by several types of institutions: vocational high schools,[29] general or academic high schools,[30] and apprentice training centers.[31] In 1991–92, 71 percent of upper secondary students were enrolled in general or academic programs, with 30 percent in vocational–technical programs (table 2.3). Among those students pursuing vocational studies at the upper secondary level, 69 percent were enrolled in a program leading to a BEP.

Table 2.3—Percentage of upper secondary students in France, by courses of study: 1991–92

	Percent Enrolled
Upper secondary	
General or academic	70.5
Vocational–technical	29.5
Total upper secondary	**100.0**
Upper secondary vocational enrollments by certification program type	**100.0**
Vocational certificate (CAP)[1]	12.6
Occupational certificate (BEP)	69.4
Vocational–occupation certificate[2]	0.7
Vocational high school diploma (BP)	17.4

[1]Includes third-year CAP students who began during lower secondary (for these students, the first two years are considered lower secondary) and first- and second-year CAP students who began after receiving a lower secondary diploma.
[2]CAP and BEP combined.

NOTE: May not sum to 100 percent due to rounding.

SOURCE: Ministère de L'Éducation Nationale, "Effectifs du Second Degré: Public + Privé 1991–92," *Note d'Information*, 92.08, Tableau I, 4.

Within vocational high schools, students can prepare for a CAP or a BEP. Both certificates are designed to prepare students for skilled blue- and white-collar jobs or a vocational occupation certificate[32] in one of 21 career areas. Vocational high school students can also work toward a vocational high school diploma (BP).[33]

[29]*Lycée Professionnel.*
[30]*Lycée.*
[31]*Centre de Formation d'Apprentis* (CFA). The status of vocational education causes many to worry that these options may lose their importance as a training ground for skilled labor and may become a remedial option for those not performing well in the academic stream (CEDEFOP 1989).
[32]*Mention Complémentaire au CAP et BEP.*
[33]*Baccalauréat Professionnel.*

As noted, for students who did not attain lower secondary diplomas, the vocational program leading to the CAP requires 3 years of full-time general and vocational coursework, including on-the-job training. It only takes 2 years for students who have lower secondary diplomas. Graduates of CAP or BEP programs who do well in both vocational and general studies can reenter the general education system at the 10th-grade level and attend an academic high school.[34] Further, a student who receives high marks on the BEP qualification exam has the option of transferring to the second year of high school[35] in order to pursue a technical high school diploma (BT)[36] or a technical high school certificate (BTn).[37]

The BP program is a more advanced vocational qualification. It requires a minimum of 4 years of vocational studies (including a 2-year BEP). Vocational diploma students are required to spend 12–24 weeks working in their field of study with an "in-firm" trainer. The degree is designed to lead students directly into skilled white- or blue-collar jobs.

Within general or academic high schools, students can pursue programs leading to technical high school diplomas (BT) and technical high school certificates (BTn). In addition to general academic courses, students in these programs acquire specialized training that directly prepares them for an occupation (most programs train students in modern technologies). The technical certificate requires 1 year of high school coursework and specialization in particular occupational fields. However, very few students pursue technical certificates (Ambassade de France 1992). The technical high school diploma requires 3 years of high school in order to prepare for the technical high school diploma examination. These qualifications prepare students for supervisory staff positions.

Also, at age 16, postcompulsory upper secondary students can enter an apprentice training center where they can complete work toward a CAP while apprenticing. In 1985, of those students who took the vocational certificate examination, 45 percent of apprentices and 56 percent of vocational high school students successfully passed (CEDEFOP 1989).

A principal education goal of the French government is to have 80 percent of its students graduate with high school diplomas by the year 2000. In 1990, 39 percent of students aged 18–19 received a high school diploma (Ambassade de France 1991). There are three types of diplomas: 1) the general or academic diploma;[38] 2) the technical diploma; and 3) the professional diploma.[39] In 1990, 50 percent of students in the last year of upper secondary (typically 18- through 19-year-olds) sat for either the general, technical, or professional diploma exams. Seventy-five percent of those taking the general diploma exam passed, while 69 percent of those taking the technical diploma exam were successful (Ambassade De France 1991).

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[34] *Lycée.*

[35] *Lycée Technique.*

[36] *Baccalauréat Technicien* (BT).

[37] *Brevet de Technicien* (BTn).

[38] There are eight areas of study leading to a general baccalaureate (e.g., mathematics, physics and chemistry, agriculture, philosophy, and so on), and 20 technical baccalaureate areas of study (e.g., civil engineering, energy and industry, music, and so on).

[39] The professional baccalaureate was introduced in the 1985–86 school year. These new degree programs have been created in "professional" fields such as sales, maintenance and automated systems, and computer-aided manufacturing.

Postsecondary Vocational Options

Those with high school diplomas can enter technical training programs leading to an advanced technical diploma[40] or a technical university degree.[41] These programs require 2 years of postsecondary study and provide advanced technological education. The advanced technical diploma programs are offered primarily in universities and in social, paramedical, or commercial schools. These technical diplomas train students for fairly specific jobs. Because these programs are more narrow and specialized than the technical university degree programs, students who have these diplomas are considered less retrainable than technical degree students. Technical university degree programs that are designed to prepare students for rapid promotion to managerial positions in their field are offered in universities. In 1988–89, nearly 32 percent of students who passed the high school diploma exams entered technical diploma or technical degree programs—10 percent entered degree programs and 22 percent diploma programs.

Vocational Training Programs Outside the Education System

France has a long-standing apprenticeship tradition for persons aged 16–25; however, relatively few participate. Although the numbers of young people participating full time in upper secondary education have grown from 800,000 students in 1960 to more than 2 million in 1989, the numbers participating in apprenticeships have not significantly changed over the past two decades. In 1989, the equivalent of 11 percent of all full-time upper secondary students participated in an apprenticeship program (Wolf and Rapiau 1993).

An apprenticeship contract can last from 1 to 3 years; the length of the contract depends upon the profession and the qualification an apprentice wants to achieve. Approximately 75 percent of apprentices hold contracts with firms employing fewer than 10 people, and most apprenticeships are in the traditional crafts and trade sectors: construction, auto mechanics, agriculture and food preparation, and retail (CEDEFOP 1989). Apprenticeships can prepare students for vocational or technological education certificates at both the secondary and upper secondary levels.[42]

Apprentices receive a training wage (15 to 60 percent of the statutory minimum wage), according to the apprentice's age and semester in training (CEDEFOP 1989). In addition, apprentices are required to attend classes at a training center for a minimum of 400 hours per year. About one-third of the classes offered at these training centers are in general education, and about one-third each are practical vocational education classes and theoretical vocational education classes (CEDEFOP 1989).

There are also local programs—school-to-work transition projects—directed at 16- through 25-year-olds (Nothdurft 1989).[43] Further, other ministries administer training programs and schools. For example, the Ministry of Agriculture runs agricultural high schools and postsecondary programs in agronomy (Nothdurft 1989).

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[40] *Brevet de Technicien Superieur* (BTS).

[41] *Diplôme Universitaires de Technologie.*

[42] Before 1987, apprenticeships only prepared students for the CAP. After reforms were passed in 1987, apprentices could train students for further vocational certificates (e.g., professional baccalaureate within the apprenticeship system).

[43] *Missions Locales.*

Vocational Education Curricula

Elementary and lower secondary school curricula are predominantly academic. In 1984, the French government introduced classes in technology at the lower secondary school level as part of the required curriculum. However, most vocational curricula are found within the prevocational and preapprenticeship training programs (which will soon be phased out) and the alternative technological curriculum. The technological curriculum provides a similar, but more limited (and less rigorous), academic curriculum with more prevocational coursework.

The extent of contact with vocational curricula from upper secondary school and beyond depends upon the course of study undertaken. Within general and academic high schools, where students prepare for general and technical high school diplomas, vocational courses such as office automation and automation technology are offered as electives. Within vocational high schools, students attend both general education and vocational education classes between 31 and 36 hours per week.

Participation in Vocational Education

In 1986, among persons aged 16–25, 36 percent were employed, 33 percent were students, 19 percent were unemployed or not the labor force, 3 percent were in military service, 3 percent were apprentices, and 6 percent were participating in a government employment training program (table 2.2) (CEDEFOP 1989).[44] In 1987, in response to the problem of school leavers who have no formal vocational or academic qualification, several school reforms were suggested by a government High Commission for Education and the Economy. Among the reforms being implemented are the following:

- Establishing an "occupation-related" option within lower secondary schools—that is, vocational secondary schools for students in the eighth and ninth grades; and
- Establishing a prevocational program for low-achieving students within vocational secondary schools and apprentice training centers.[45] This program would lead to a 2-year program to enable students to prepare for the CAP or BEP exam.

These two new vocational paths are meant to replace the secondary prevocational (CPPN) and preapprenticeship (CPA) courses of study.[46]

Table 2.4 shows levels of participation in vocational curricula and training and types of certification among school leavers aged 16–22.

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[44]The balance was idle or status unknown.

[45]*Classes de formations pré-professionnelles.*

[46]The High Commission argued that secondary student enrollment should be distributed as follows: 75 percent in general education, 15 in the occupation-related option, and 10 percent in prevocational studies.

Table 2.4—Number and percentage of school leavers in France, by participation in apprenticeship and level of certification, by age: 1985

Age	Number of school leavers	Apprentices	No diploma	Lower secondary diploma	Vocational or occupational certificate*	Upper secondary diploma	Higher education
16	78,753	55.9	41.7	0.7	1.7	0.0	0.0
17	39,520	21.6	36.1	11.8	30.5	0.0	0.0
18	74,686	4.3	28.4	13.8	46.5	6.3	0.8
19	45,062	1.8	15.5	12.9	47.9	19.4	2.5
20	32,233	1.2	7.8	14.4	22.9	40.1	13.6
21	27,061	0.0	2.1	8.5	8.1	40.5	40.8
22	106,024	0.5	2.4	4.0	3.6	20.3	69.2

*CAP or BEP.

SOURCE: Data drawn from Centre d'Études et de Recherches sur les Qualifications, Direction de l'Evaluation et de la Prospective, Institut National de la Statistique et des Études Économiques (INSEE), *Bilan Formation-Emploi, 1985,* no. 251 (June 1988).

Vocational Education in Germany[47]

Responsibility for elementary and secondary education in (former) West Germany rests mainly with the 11 federal states. Although they all share a common educational structure, each state's school system varies in its organization, administration, financing, and curricula planning. While the federal government is only modestly involved in general education programs, it plays a leading role in the "dual system"—the upper secondary-level program that combines part-time in-class education with on-the-job training.

The private sector plays a major role in vocational training. The dual system is a joint venture of business and the education system: businesses provide on-the-job training, and schools supplement training with classes in general and vocational subjects. In addition, unions and trade associations play a role in vocational training by providing recognized performance standards for certification.

Compulsory education begins at the age of 6 and lasts 12 years until age 18. Students are required to attend school full time for 9 years.[48] During the last 3 years (or until an apprenticeship is completed), students are only required to attend school part time. Primary education begins at the age of 6 and continues for 4 years (grades 1 to 4).[49] Subsequently, teachers and school administrators place students in the different types of secondary schools (grades 5 to 9):[50] general,[51] intermediate,[52] and grammar or academic.[53] Some states have introduced a fourth type of school, a comprehensive lower secondary school.[54] Since 1976, the first 2 years of lower secondary curricula (grades 5 and 6) have been standardized across all types of schools, enabling students to transfer among the three types of schools. Assignment to a course of study is determined after the sixth grade.

In 1991, 30 percent of lower secondary students attended general lower secondary schools; 25 percent attended intermediate lower secondary schools; 31 percent attended academic or grammar secondary schools; 7 percent attended comprehensive lower secondary schools; and 6 percent were enrolled in an orientation program that was independent of a lower secondary school (Federal Ministry of Education and Science 1992c). Over the past two decades, enrollments in general lower secondary schools have declined as more students are pursuing an academic track through intermediate and grammar schools.

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[47]This overview describes the educational system of the former West German Republic. Education in the 11 former West German states has not changed as a result of reunification. The five newly created states of former East Germany have begun phasing in aspects of the West German educational system. Full implementation of a uniform educational system throughout the unified country will depend on such developments in the East German states as strengthening the economic base and movement from centralized to state-controlled school administration.

[48]Ten years in Berlin, Bremen, and North Rhine-Westphalia.

[49]In Berlin, elementary school (*Grundschule*) lasts 6 years.

[50]Parents can appeal a student's assignment to lower secondary school; however, the ultimate decision rests with the school. The education system does include bridges to and from academic and vocational tracks via achievement tests, although the majority of students stay within their educational track.

[51]General lower secondary schools (*Hauptschulen*) primarily prepare students for vocational training.

[52]Intermediate lower secondary schools (*Realschulen*) provide a more rigorous academic education to their students than do general lower secondary schools. Intermediate lower secondary students have immediate access to more vocational training and academic opportunities than do their general school counterparts.

[53]Grammar or academic lower secondary schools (*Gymnasium*) prepare students for entrance into institutions of higher education.

[54]Comprehensive lower secondary schools (*Gesamtschule*) offer curricula that bridge all three types of lower secondary schools, facilitating the transfer of students from one type of curriculum track to another.

In their last 2 years of lower secondary school, all students are required to participate in an occupational education program,[55] which exposes them to the "world of work" and the dual system. This program is designed to help students choose a vocational area of interest, prepare them for the dual system, and find an employer willing to accept them as an apprentice.

General lower secondary school culminates in the ninth grade, usually with a general lower secondary certificate.[56] Intermediate lower secondary school often lasts a year longer than general lower secondary school and awards students an intermediate lower secondary certificate. This certificate qualifies students to sit for the entrance examination for the upper secondary portion of academic (grammar) school or to enter upper secondary technical schools. Academic secondary or grammar school bridges both lower and upper secondary education, providing curricula up through the 12th grade. Upon completion of their coursework, grammar school students qualify for the university entrance examination that enables them to enter higher education.

In a 1984 survey of 477,300 lower secondary graduates, 55 percent planned to enter an apprenticeship program; 34 percent wanted to attend a full-time vocational school; 8 percent planned to pursue full-time academic education; 2 percent planned to enter the labor market as unskilled labor; and 1 percent were undecided. In addition, 55 percent of general lower secondary school graduates and 58 percent of intermediate lower secondary school graduates reported that they wanted to enter an apprenticeship program. An estimated 15 to 20 percent of academic lower secondary school graduates planned to enter an apprenticeship program (Braun 1987).

However, there is some indication that the transition from lower secondary school has changed somewhat since the early 1980s. During this time, a large generational cohort entered the upper secondary education and training system. Given the substantial numbers of students, demand for apprenticeship training opportunities exceeded the available pool of positions.[57] As a consequence, the numbers and percentages of students enrolled in full-time vocational education increased during this decade.

At the upper secondary level, more students are involved in the dual system than in any other educational program. In 1986, 57 percent of 16- through 18-year-olds were participating in the dual system; 20 percent were enrolled in a full-time vocational program; 21 percent were enrolled in grammar school; and about 3 percent were enrolled in a part-time vocational program only (Association of German Chambers of Industry and Commerce 1988).[58]

Participation in the education system remains relatively high for young people until the age of 19. In 1991, 82 percent of 18-year-olds and 60 percent of 19-year-olds were enrolled in school. Also, 41 percent of 20-year-olds were still enrolled in school (table 2.5).

Figure 2.2 describes the proportion of enrollments by school level and curriculum in German lower and upper secondary programs.

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[55] *Arbeitslehre.*

[56] In some states, general school students who remain in school until the 10th grade are awarded the more advanced intermediate certificate.

[57] For example, in 1984, although there were 705,600 new training contracts (i.e., 705,600 young people entered a new apprenticeship), 58,400 applicants were left unplaced and 21,100 apprenticeship positions were left unfilled. (Fifty-nine percent of students aged 16–18 participated in an apprenticeship.) In 1991, while a higher proportion (75 percent) of students aged 16–18 were apprentices, there were fewer new training contracts (540,300) and only 11,200 unplaced applicants (Federal Ministry of Education and Science 1992a).

[58] In 1990, 73 percent of students aged 16–18 were apprentices. Regardless of participation in an apprenticeship, 47 percent of these students were enrolled in full- or part-time vocational schools, and 24 percent were enrolled in grammar schools (Federal Ministry of Education and Science 1992a).

Table 2.5—Percentage of young people participating in the educational system in Germany, by age and school type: 1991[1]

	Age									
	16	17	18	19	20	21	22	23	24	25
Percent of age group enrolled in school	**96.5**	**96.8**	**81.9**	**60.0**	**41.2**	**30.7**	**26.8**	**24.3**	**20.2**	**16.9**
Percent of age group enrolled by type of school[2]										
Academic secondary schools[3]	25.8	24.4	22.6	12.3	2.8	0.7	0.3	0.3	0.3	0.3
Other types of secondary schools[4]	36.3	13.5	1.8	0.6	0.3	0.1	0.1	0.1	0.1	0.1
Part-time vocational schools[5]	24.8	43.4	44.7	33.9	21.6	12.1	7.5	5.4	2.6	0.9
Full-time vocational schools[6]	8.3	11.2	7.2	4.3	2.9	1.7	1.9	1.1	0.1	0.1
Trade and technical schools[7]	1.6	4.2	5.3	5.3	4.7	3.6	2.7	2.2	2.1	1.6
Higher education institutions[8]	—	—	0.2	3.7	8.9	12.5	14.4	15.3	15.0	14.1

—Cell size too small.

[1]Geographic area defined as the former Federal Republic of Germany including West Berlin before October 3, 1990.

[2]May not add to total due to rounding.

[3]*Gymnasien.*

[4]Includes elementary and lower secondary general schools (*Grudschulen* and *Hauptschulen*), comprehensive schools (*Gesamtschulen*), intermediate lower secondary schools (*Realschulen/Abendreschulen*), and special schools (*Sonderschulen*).

[5]Includes students enrolled in their basic training year in part-time vocational schools (*Berufsschulen*) and in vocational extension schools.

[6]*Berufsfachschulen.*

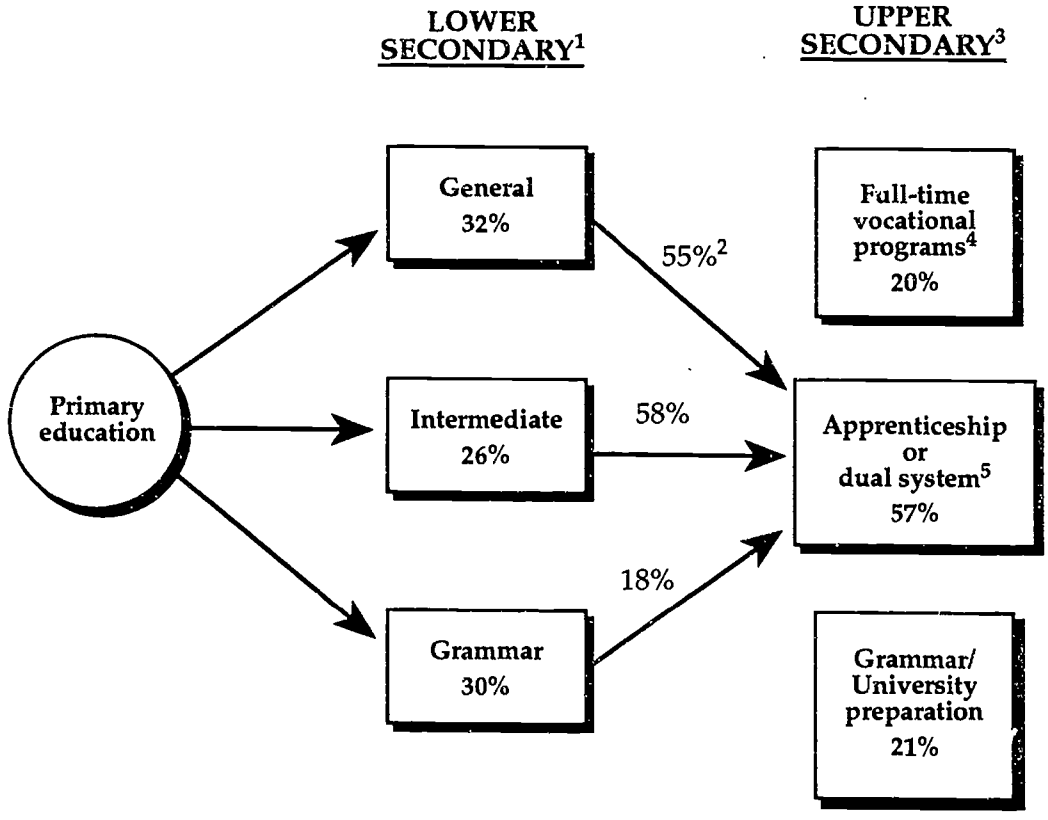
[7]Includes technical programs in grammar schools (*Fachoberschulen/Fachgymnasien*) and other trade and technical schools (*Fachschulen/Schulen des Gusundheitswesen*).

[8]*Hochschulen.*

SOURCE: Federal Ministry of Education and Science, *Basic and Structural Data: 1992/93* (Bonn: November 1992).

Figure 2.2

GERMANY: Proportion of enrollments by school level and curriculum



[1]Six percent of students attended comprehensive lower secondary schools, and 6 percent attended an orientation program independent of a lower secondary school. These percentages are based on students in the lower secondary school system at any age (1988).

[2]These percentages are based on completers of each of three types of schools. For example, this percentage reads 55 percent of all general lower secondary school graduates entered an apprenticeship program (1984). Percentage of students moving from lower secondary to upper secondary apprenticeships or the dual system is lower than the percentage of upper secondary students in apprenticeships or enrolled in the dual system for several reasons: (1) Lower secondary data are for 1984, upper secondary data are for 1988; and (2) Percentage participating in apprenticeships or the dual system include some students who did not complete lower secondary and some who did not graduate the prior year.

[3]The remaining young people attended vocational programs part time. These percentages are based on the general population ages 16–18 (1988).

[4]Full-time vocational programs include programs within full-time vocational schools as well as full-time programs at vocational extension schools.

[5]Dual system participants attend part-time vocational schools.

SOURCE: Federal Ministry of Education and Science, *Basic and Structural Data: 1992/93* (Bonn: 1992); Frank Braun, "Vocational Training as a Link between the Schools and the Labour Market: The Dual System in the Federal Republic of Germany," *Comparative Education* 23 (2) (1987); Association of German Chambers of Industry and Commerce, *The Dual System: Vocational Training in the Federal Republic of Germany* (Bonn: Deutsche Industrie and Handelstag, 1988).

Organization of Vocational Education and Training

Vocational education and training begin at the upper secondary level. In 1991, 74 percent of all upper secondary students were enrolled in a vocational education program (table 2.6) (Federal Ministry of Education and Science 1992a). Students can pursue vocational education through full-time or part-time vocational schooling or through the dual system.[59] While vocational education and apprenticeship training are not necessarily restricted to graduates of lower secondary school, it is assumed that students have obtained at least a general lower secondary school certificate; in fact, many apprenticeship programs will not accept students without one.

Just before entering the dual system, students may participate in a Vocational Foundation Training Year.[60] The purpose of this program is to provide a broad base of knowledge in a particular vocational area, preparing students for vocational training in a specific occupation or to enter the labor market as unskilled workers. This program takes one of two forms: the cooperative form and the school form. In the cooperative form, instruction alternates between in-class coursework and on-the-job training; in the school form, all instruction takes place at school. Some basic training year programs have articulated agreements with related businesses, which allows students to apply the program toward the first 6 to 12 months of an apprenticeship program.[61]

Students train for different types and levels of vocational certification. German industry and guilds define four levels of expertise: apprentice, journeyman or skilled blue- or white-collar worker, technician, and master. These are accompanied by four levels of certification: state-certified assistant, journeyman or skilled blue- or white-collar worker, technician, and master. To receive a higher level certification (for example, technician or master), a worker must pass a national examination and frequently have related work experience in the chosen trade or occupation. Thus, within the vocational education system, there are many different levels and types of vocational institutions catering to students seeking various levels of expertise and certification.

Vocational Education Within the Dual System

The dual system is a partnership between industry and the government that is designed to provide young people with supervised on-the-job training supported by part-time general and vocational instruction. The objective of the dual system is to produce skilled workers who have both the theoretical and practical skills associated with their chosen occupations. The in-class portion of occupational training is intended to ensure that all apprentices have a uniform base of knowledge in their occupational field.

Students in the dual system can choose their training program from more than 400 recognized skilled occupations (Federal Ministry of Education and Science 1992a). Under a comprehensive vocational training law passed in 1960, the federal government sets the minimum requirements for each occupation by standardizing: 1) the essential content of the training area; 2) the amount of training required; 3) the job description (type and scope of the qualification acquired upon completing the apprenticeship); 4) the basic training plan (timing and sequence for the teaching of competencies); and 5) the requirements for intermediate and final examinations.

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[59] For all people under the age of 18, vocational training by law must involve at least a part-time in-school program. This is the basis for the dual system: apprenticeship training with paid release time for apprentices to complete compulsory part-time education.

[60] *Berufsgrundbildungsjahr.*

[61] Full-time vocational students may sometimes substitute 1 year at a full-time vocational school for the first year of an apprenticeship program.

Table 2.6—Number and percentage of upper secondary students in general and vocational education and in vocational schools in Germany, by type of school: 1991[1]

Type of program	Number	Percentage
Students in general education (nonvocational)	802,300	26.5
Students in vocational education (all types)	2,223,400	73.5
Total vocational students:	2,223,400	100.0
Part-time vocational schools[2]	1,421,500	63.9
Full-time vocational schools[3]	232,500	10.5
Basic vocational training year[4]	109,600	4.9
Vocational extension schools[5]	7,800	0.4
Upper secondary technical schools[6]	143,700	6.5
Trade and technical (full-time)[7]	120,000	5.4
School for nurses, midwives, etc.	112,000	5.0
Other vocational schools	76,300	3.4

[1]Geographic area defined as the former Federal Republic of Germany including West Berlin before October 3, 1990.

[2]*Berufsschulen.*

[3]*Berufsfachschulen.*

[4]Includes full-time prevocational training year programs (*Berufsvorbereitungsjahr*) and both full-time and part-time vocational training year programs (*Berufsgrundbidungsjahr*).

[5]Includes both full-time and part-time programs (*Berufsaufauschulen*).

[6]Includes specialized grammar schools (*Fachgymnasien*) and other programs leading to advanced studies in technical subjects (*Berufstechnische Oberschulen, Fachoberschulen*).

[7]*Fachschulen.*

SOURCE: Federal Ministry of Education and Science, *Basic and Structural Data: 1992–93* (Bonn: November 1992).

Apprentices and employers enter into a written contract defining the responsibilities of each party, the duration of the apprenticeship, and the wages to be paid.[62] In 1991, the average monthly wages of an apprentice were approximately $567 in U.S. currency.[63] However, apprenticeship wages can differ quite significantly across occupational areas (Federal Ministry of Education and Science 1992b). Employers release apprentices during the week or give them blocks of time so that they can attend vocational school or classes to fulfill the compulsory school requirement.

Approximately 500,000 firms participate in the dual-system training program. Fifty percent of German companies in the Chamber of Trade and Craft and 25 percent of companies in the Chamber of Industry and Commerce offer apprenticeships (Nothdurft 1989).[64] Although firms and businesses are not obliged to train apprentices in the dual system, there is a long history of private and public industry participation.

Employers shoulder much of the financial burden of apprentice training. In fact, they receive no special tax benefits or other considerations from the government.[65] Businesses pay the salaries of apprentices, as well as bear the mentoring costs and the expense of additional teaching materials and workshops.[66] Federal and state funding pays for only the in-class portion of apprenticeship training (part-time vocational school). While 60 percent of all apprentices receive hands-on instruction in a firm with less than 50 employees, 24 percent are trained in firms with 50 to 500 employees. Moreover, 5 percent of all apprentices are trained in firms with 500 to 1,000 employees, and 1 percent of apprentices train in major industrial companies with more than 1,000 employees. Ten percent of apprenticeship placements were not accounted for (Federal Ministry of Education and Science 1992b).

In contrast to the on-the-job training component of the dual-system program, which is largely administered by the federal government, state governments have more control over the courses taught during the in-class portion of the program. On average, apprentices spend 1 to 2 days per week at a state-operated part-time vocational school; however, they do not always attend class every week. The purpose of these classes is to provide a theoretical base to support in-firm training, and to ensure that all apprentices possess a uniform foundation of knowledge in their trade.

The duration of apprenticeships varies from 2 to 3.5 years. Students with superior scholastic qualifications and those who quickly master skills can apply to have their training period shortened. Students who complete an apprenticeship become qualified as a skilled blue- or white-collar worker or journeyman.

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[62]Wages are based upon minimum national standards determined by occupation and set by trade unions and employer associations.

[63]838 German marks.

[64]German law requires that all businesses are members of either the Chamber of Trade and Craft or the Chamber of Industry and Commerce. These organizations provide advice on state vocational education standards, supervise apprenticeship training, and operate vocational centers in areas where the government does not have any such centers. Trade guilds are another important kind of business and industry organization. The guilds run workshops and training sessions in new technology, keeping members up-to-date in their vocation.

[65]Since the mid-1970s, federal and state programs have emerged to assist and subsidize certain training programs. Those programs receiving assistance are typically in structurally weak regions, or they focus on special populations (e.g., students needing remediation).

[66]Some firms do not believe that the state vocational school classes meet their needs. In response, they often establish their own in-house, in-class training programs, send their apprentices to workshops held by trade guilds, or both.

Education in Vocational Schools

Whether participating in the dual system or otherwise engaged in vocational training, all German students must attend school until the age of 18. Three forms of vocational schooling are available at the upper secondary level: part-time vocational schools, full-time vocational schools, and other vocational schools. Part-time vocational schools largely serve dual-system participants, as noted above. Full-time vocational schools and other types of technical schooling mostly serve students who are seeking occupational certification outside the dual system.

Part-Time Vocational School[67]

Students in part-time vocational schools are beginning their vocational training (either within or outside the dual system). Although they have left or graduated from other secondary schools (where they have completed their *full-time* compulsory school requirement), they are obligated to attend school part time because they are still of compulsory school age. A part-time vocational school certificate qualifies a student for admission to advanced vocational schools.

Full-Time Vocational School[68]

These schools provide instruction for 1 to 3 years and offer three main types of programs. First, they provide training courses and certificates in occupations not covered by the dual system, such as nursing. Second, these schools offer training (usually 1 year) that can serve as a substitute for the initial vocational training year in the dual system or that can be used to upgrade secondary school certification. Last, they offer programs in occupations within the dual system that lead to vocational qualifications. For example, a student who completes a 2-year full-time vocational school program can receive a vocational qualification as a state-certified assistant (below the level of a journeyman or skilled worker).

Other Vocational Schools

Approximately one-quarter of upper secondary vocational students are enrolled in programs at institutions other than full- or part-time vocational schools as described above. These options include vocational extension schools,[69] upper secondary technical schools,[70] upper secondary grammar schools with a technical bias,[71] and advanced vocational training schools.[72] These schools provide continuing instruction in dual-system areas, extend general education, and/or provide specialized training.

Vocational extension schools provide both academic and vocational classes. Educational programs in these schools tend to be 1 year (full time) in duration, and culminate in a certificate of completion equivalent to the intermediate lower secondary certificate. These schools provide opportunities for students to further their vocational studies, to help them move on to more advanced academic or vocational programs, or both.

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[67] *Berufsschule.*
[68] *Berufsfachschule.*
[69] *Berufsaufbauschule.*
[70] *Fachoberschule.*
[71] *Berufliches Gymnasium.*
[72] *Fachschule.*

Upper secondary technical schools require an intermediate lower secondary certificate for entrance. Courses of study last for 2 years, combining hands-on training with in-class work, and they include both academic and vocational coursework. Students who successfully complete the program can enter university-level technical programs.

Upper secondary grammar schools with a technical bias provide the same level of academic education as the upper secondary levels of academic grammar schools except that career-related subjects, such as economics and engineering, are available. However, these courses are only offered as advanced course options. Students who successfully complete the program can enter higher education.

Advanced vocational training schools provide extensive skill training and require an intermediate lower secondary certificate and vocational education training for entrance. These schools offer 1- to 3-year programs designed to enhance initial vocational qualifications or practical experience. Students who successfully complete the program can enter higher education.

Vocational Education Curricula

All vocational schools provide both general and career-related curricula.

Part-Time Vocational School

The part-time vocational school curriculum combines general and career-related education that meets the requirements for federal vocational training in the dual system. About 40 percent of coursework involves general education in economics, German, mathematics, religion, social studies, and foreign language (EURYDICE and CEDEFOP 1991). Trade-related classes make up the rest of the in-class instruction.[73] During the first year of vocational training, students choose courses in 1 out of 13 career areas.[74]

Full-Time Vocational School

Students receive between 30 and 35 hours of classroom instruction each week (EURYDICE and CEDEFOP 1991). They are offered a wide range of courses that cater to a large number of training objectives, from studying for an intermediate lower secondary certificate to qualification as a state-certified assistant. Thus, a student's mix of classes will depend upon individual training objectives.

Other Vocational Schools

Vocational extension schools provide both academic and vocational classes. For example, 50 percent of total classroom hours are devoted to general education subjects, and at least 160 hours are devoted to instruction in a student's vocational area of specialization (EURYDICE and CEDEFOP 1991).

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[73] *Fachklassen.*

[74] The vocational areas include economics and administration, metalwork, electrical engineering, construction engineering, woodworking techniques, textiles and clothing, chemistry/physics/biology, printing, painting and interior design, hygiene, health, agronomy, and nutrition/home economics.

The upper secondary technical school curriculum combines in-class study with on-the-job training. Students spend 80 percent of their time during the first year in hands-on training and 20 percent in class. The second year is primarily devoted to in-class activities, with 60 percent of the coursework dedicated to general education subjects.

Upper secondary grammar schools with a technical bias have course offerings that are similar to those in the upper secondary levels of academic grammar schools, and they also provide career-related courses as options.

The curriculum in advanced vocational schools varies depending upon the subject area. Most programs prepare students for state examinations in their subject area, which mark the successful completion of their program.

Participation in Vocational Education

The largest proportion of students in the vocational education system attend part-time vocational schools. This can be explained by the fact that these schools are the major provider of in-school training for the dual system.

Participation in the Dual System

In 1992, 1.66 million people were enrolled in the dual system (Federal Ministry of Education and Science 1992b). Approximately two-thirds of lower secondary school completers directly enter the dual system, and 90 percent of young people who complete lower secondary school eventually participate in dual-system training. However, not all of them achieve certification (Federal Ministry of Education and Science 1991).

In 1991, the top four occupational choices among male apprentices were automobile mechanic (8 percent), electrician (5 percent), machine and systems technologist (4 percent), and business specialist in wholesale and foreign trade (4 percent). Forty-nine percent of all male apprentices were training in one of 15 trades (Federal Ministry of Education and Science 1992c).

For female apprentices, the top four occupations were medical assistant (8 percent), retail clerk (7 percent), hairdresser (7 percent), and office clerk (6 percent). Approximately 67 percent of all female apprentices were training in one of 15 trades (Federal Ministry of Education and Science 1992c).

Student Outcomes

Depending upon the trade area, 85 to 95 percent of apprentices in the dual system pass their final examinations and become journeymen,[75] skilled blue-collar workers,[76] or skilled white-collar workers (Federal Ministry of Education and Science 1992b).[77] Approximately 8.4 percent of apprentices drop out of their training program each year, and about 50 percent of these dropouts pursue a different occupational area.

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[75] *Geselle.*
[76] *Facharbeiter.*
[77] *Fachangestellter.*

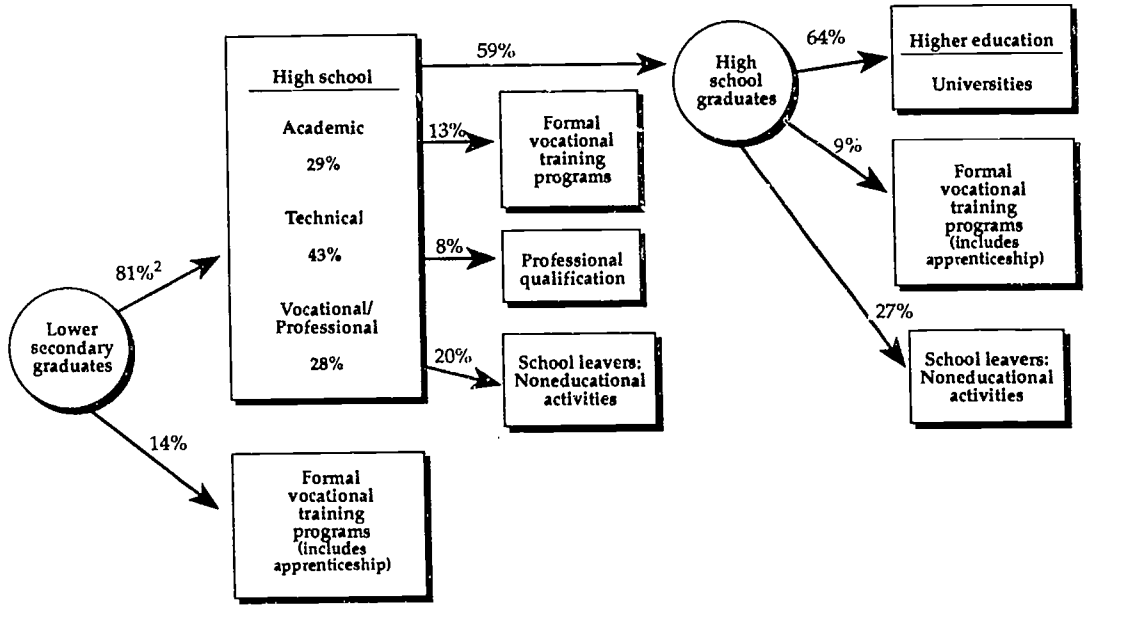
The Federal Ministry of Education and Science reports that 6 months after completing apprenticeship training, 52 percent of these young people were employed in their trained occupation; 15 percent were employed in another field; 10 percent had entered the military or alternative national services; 13 percent had continued on to further education or other training; and 10 percent were unemployed (Federal Ministry of Education and Science 1992d).

Vocational Education in Italy

Compulsory education in Italy spans 8 years—from age 6 to 14—and includes elementary grades 1 through 5 and lower secondary grades 6 through 8. Despite periodic reforms, the education system has remained quite centralized at all levels, with the state setting the curricula for general education programs. During the compulsory grades, students follow a standardized academic curriculum and teachers evaluate students two to three times each academic year. Each student is given a written assessment of scholastic achievement, behavior, and attitudes,[78] and must receive a favorable evaluation to be promoted to the next grade. In order to attain a lower secondary school diploma,[79] students must pass a lower secondary examination. For those who successfully complete lower secondary schooling, teachers suggest further courses of study that they feel are appropriate to the students' interests and skills.

Figure 2.3

ITALY: Education Flows[1]



[1]The student flows were calculated by Centro Studi Investimenti Sociali (CENSIS), using 1987–88 graduation and placement rates.

[2]Five percent of lower secondary graduates do not enter high school.

SOURCE: CENSIS, *Italy Today: Social Picture and Trends, 1990* (Rome: 1991), 106.

[78]*Scheda Personale.*
[79]*Diploma di Licenza Media.*

Upper secondary education includes a broad array of institutional types—classical education schools, art institutes, technical schools, and vocational schools. Each is part of a complex matrix of schools and curricula. For example, 200 kinds of vocational schools offer 150 different curricula. High school programs are 5 years in duration.[80] Students with favorable school evaluations (i.e., *Scheda Personale*) qualify to take an examination for the upper secondary diploma,[81] and diploma recipients qualify for university-level studies. A majority of lower secondary graduates pursue postcompulsory (high school) education. In 1989–90, 65 percent of those aged 14–18 were enrolled in school (CENSIS 1991).

Figure 2.3 on the previous page describes student enrollments in Italian secondary schools and postsecondary institutions.

Organization of Vocational Education

Vocational education and training begins after compulsory education. Within the education system, there are upper secondary vocational and technical schools administered by the State Ministry of Education. In 1987–88, 81 percent of lower secondary graduates entered upper secondary school, and 71 percent of these students enrolled in vocational and technical schools (table 2.7). Outside the education system, there are other vocational options funded by the Ministry of Labor and administered by regional governments.

Table 2.7—Percentage distribution of lower secondary graduates in Italy, by education, training status, and program type: 1987–88*

	Percent enrolled
Upper secondary education	**80.9**
Non-school-based vocational options	**19.2**
Upper secondary enrollment by type of program	100.0
Academic (including art)	29.0
Technical	43.4
Vocational–professional	27.6
Non-school-based vocational options by type of program	100.0
Regional vocational training	33.3
Apprenticeships	27.8
Other	38.9

*Percentages were calculated by Centro Studi Ivestimenti Sociali (CENSIS), using 1987–88 graduation and placement rates.

NOTE: May not sum to 100 percent due to rounding.

SOURCE: CENSIS, *Italy Today: Social Picture and Trends, 1990* (Rome: 1991), 106.

[80]Vocational high schools also have 2- to 3-year programs aimed at preparing students for industry-qualifying examinations.

[81]*Maturitá.*

Technical Schools

In 1989–90, nearly 47 percent of upper secondary school students attended one of the nine types of technical schools (*Istituti Tecnici*): agriculture, commerce, business with a foreign language, tourism, surveying, industry, foreign trade, naval, and office and clerical support (EURYDICE and CEDEFOP 1991). Out of the nine programs, a majority of students chose to enroll in commercial and industrial programs in 1990–91 (table 2.8). Technical school programs are 5 years in duration, with the curricula in the first 2 years being fairly similar to classical upper secondary academic education. During the last 3 years, although the curricula still contain some general education, the focus is mostly on the student's area of technical concentration.

Table 2.8—Number and percentage of students enrolled in upper secondary vocational and technical education in Italy, by type of program: 1990–91

	Vocational–professional schools *(Istituti professionali)*	Technical schools *(Istituti tecnici)*
Number of students enrolled	1,300,528	541,576
Percent enrolled by program type		
Industrial	39.1	25.3
Commercial	37.9	51.3
Agriculture *(Agrario)*	5.7	—
Surveying *(Per Geometri)*	—	13.0
Other *(Altri)*	17.3	10.3

—Not applicable.

SOURCE: Data drawn from *Istituto per lo Sviluppo Della Formazione Professionale dei Lavoratori.*

Technical school students, like students in all upper secondary schools, are assessed two or three times during the academic year by a Class Teachers' Council. This assessment evaluates their performance on written examinations and also reviews information on attendance and participation in class, subject-specific preparation and progress, and so forth. Upon completion of the technical school program, students sit for an upper secondary technical school diploma examination. Those who pass the examination and who have received positive evaluations over the previous 2 years obtain a technical school diploma. This diploma enables a student to enter intermediate-level employment in the public and private sectors or higher education.

Vocational–Professional Schools

In 1989–90, 19 percent of upper secondary students attended vocational schools (EURYDICE and CEDEFOP 1991). These vocational schools (*Istituti Professionali*) consist of five main types: agriculture, trade and industry, commerce, hotel industry, and office and clerical support. Vocational school programs are tightly matched to labor market requirements and entry qualifications in each sector. Programs usually last 2 to 3 years (although an expansion of the vocational program to five years is being tested), and they are designed to train specialized workers in certain occupational areas. Curricula for the 2- and 3-year programs are based upon industry requirements. In order to obtain a qualifying certificate, students must take an examination testing both general education skills and knowledge in the occupational area of study. The qualification certificate allows a student to enter the fourth year of the new 5-year vocational program or a 2-year specialized vocational training course,[82] but not a university or institution of higher education.

The experimental 5-year program is fashioned after the technical school program. In the first 2 years, the curricula are largely academic, with occupational specialization taking place during the last 3 years. After completing the 5-year program and passing the vocational school diploma examination, students can attend a university or a higher education institution.

Vocational Options Outside of School

There are several vocational options outside the education system. Three of these non-school based options—apprenticeships, training–work contracts, and basic vocational training—are targeted at young people beyond compulsory schooling age. Of the 1.3 million young people participating in these vocational programs outside of school, 43 percent were apprentices; 39 percent held training–work contracts; and 18 percent were enrolled in vocational training courses (EURYDICE and CEDEFOP 1991).

- **Apprenticeship contracts** last 3–5 years. Apprentices are required to work 32 hours per week at the contracting firm and to spend 8 hours per week in classroom instruction, which usually consists of remedial or basic skill training. Apprenticeships are mainly available in the craft and commercial sectors.

- **Training–work contracts** are similar to apprenticeships in that they combine on-the-job training with classroom instruction. Contracts are 1–2 years in duration and include 40–100 hours of technical training (classroom or laboratory instruction). Completing a training–work contract leads to a qualification recognized by the occupational sector.

- **Basic vocational training** programs in the agriculture, industry, and service sectors are operated in various regions of the country. There are two levels of basic training programs offered. The first set of programs is targeted toward those who have only completed compulsory schooling. The training in these programs lasts for an average of 800–1,000 hours over a 2-year period and includes several on-the-job work-experience programs in firms. The second set of programs is targeted toward students who have completed upper secondary education and provides advanced-level vocational training. These programs last from 100–300 hours for specialized training, and 500–1,000 hours for a recognized vocational qualification.

[82]Students who enter the 2-year integration course and complete the program qualify to take the vocational school leaving examination (which is given after the 5-year program) for the vocational school leaving certificate. This certificate enables students to enter higher education institutions.

Vocational Education Curricula

Programs within the education system require substantial general education coursework. For vocational training outside the education system, curricula mainly concentrate on building capabilities in an occupational specialty, although some coursework in basic skills supports the vocational program.

Participation in Vocational Education

Of the 2.8 million upper secondary students in 1989–90, 47 percent were enrolled in a technical school and 19 percent were enrolled in a vocational school. These students are in addition to youth who participate in vocational training outside the education system (EURYDICE and CEDEFOP 1991). In 1987–88, 12 percent of lower secondary school graduates entered apprenticeships or regional vocational training programs; 35 percent entered technical schools; and 22 percent entered vocational schools (CENSIS 1991).

Student Outcomes

In 1987–88, of those students who entered upper secondary schools, 59 percent graduated and received a diploma; 13 percent pursued non-school-based vocational training options (regional vocational programs, apprenticeships, and so on); and 8 percent received a professional qualification (figure 2.3) (CENSIS 1991). Most students who sit for diploma examinations successfully pass. For example, in 1988–89, only 1.5 percent of those who took the lower secondary school diploma examination failed, as did 7.6 percent of those who took the high school diploma examination (CENSIS 1991).

Vocational Education in Japan

Japan has a centralized educational system characterized by a uniform, substantially academic curriculum. The government prescribes curriculum guidelines and credit requirements for all public schools, and teachers are paid according to a national scale. At the upper secondary or high school level, schools play a major role in placing students in colleges, universities, or the work force, as well as coordinating employer recruitment efforts.

Compulsory education begins at age 6 and lasts for 9 years. Japanese schools operate on the 6-3-3-4 model: 6 years of elementary school (ages 6 to 12); 3 years of middle school (ages 12 to 15);[83] 3 years of high school (ages 15 to 18);[84] and 4 years of college.[85] The first 9 years of elementary and middle school are compulsory, and virtually all of the eligible population attends. During these years, students are not grouped by ability[86] and they attend schools assigned to them based on their place of residence.[87] The national curriculum for elementary and middle school is predominantly academic with little exposure to vocational subjects.

Ninety-five percent of middle school graduates continue on to upper secondary education in high schools or through correspondence courses (with more than one-quarter of upper secondary students enrolled in vocational programs);[88] 2 percent pursue vocational training; and 3 percent enter the labor force (Ministry of Education, Science and Culture 1990b).[89]

At the upper secondary or high school level, students compete for placement among public schools in their district and among private institutions. The options for students at this level are education or employment, full-time or part-time education, or academic or vocational training. In reality, the range of choice depends upon a student's scholastic abilities and school performance. Placement in a "good" school depends primarily upon a student's performance in school and on a school entrance examination.[90] School counselors and teachers meet with parents and students to discuss high school options. Students can only apply to one public school at a time (there are usually two rounds of application). This procedure is intended to encourage students and parents to be realistic about their prospects during the high school application process. High schools, both public and private, are ranked within each district by their success in placing students in prestigious postsecondary institutions and by their ability to attract "good" companies to recruit at their school.

Vocational high schools tend to be the repository for students who have not performed well in middle school and whose parents do not have the resources to enroll their child in a private academic high school. In one study conducted in the late 1970s, it was noted that more than one-

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[83] *Chuugakko.*

[84] *Koto gakko.*

[85] *Daigaku.*

[86] Students with mental and physical disabilities, however, attend special schools with different curricula.

[87] Students within the public system (which accounts for 99 percent of elementary school students and 97 percent of middle school students) attend the elementary and middle school assigned to them by the district according to their home address. At the high school level, students compete for placement among public high schools in their district.

[88] Vocational programs in high schools are different from vocational training programs in miscellaneous and special training schools. Vocational programs that are not based in high schools include little or no academic coursework, and the training tends to be more focused and skill based than the vocational coursework at vocational high schools. Students in vocational programs in high schools have the same standard academic curriculum in the first year as do students in academic high school programs (except that the texts are less difficult), and only one-third of vocational students' curriculum in the second and third years includes vocational coursework.

[89] Two percent were employed, and 1 percent were unemployed.

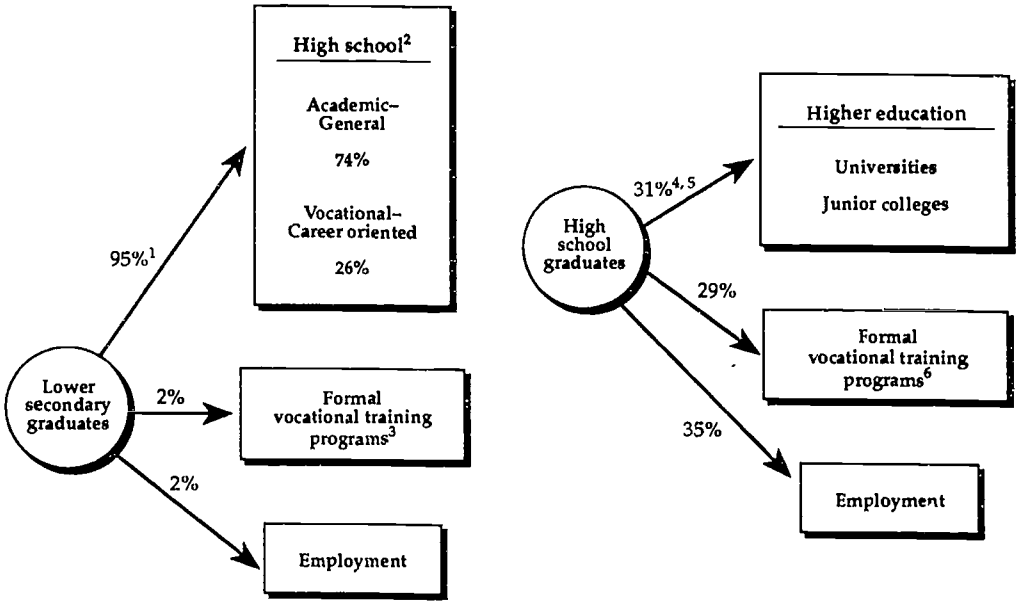
[90] Most high schools have entrance examinations. (Outstanding students may be admitted to a high school on the strength of their student records and teacher recommendations.)

third of the students entering a vocational high school still hoped to pursue an academic postsecondary program (Rohlen 1983).

In high school, students have little mobility or flexibility between academic and vocational preparation tracks, since coursework credit is mostly not transferable between departments and schools.[91] Thus, students have few options for changing their course of study except when they start over, assuming that they can gain entrance into the school or program of choice. Figure 2.4 shows the pattern of school enrollment and school leaving among students immediately after graduating from lower and upper secondary school.

Figure 2.4

JAPAN: Status of lower secondary and high school graduates 2 months after graduation by school level: 1989



[1]The percentages reflect the status of 1989 lower secondary school graduates 2 months after graduation. The balance of graduates were either unemployed, deceased, or status unknown.

[2]The percentages are based on all students enrolled in high schools in 1989.

[3]Includes students participating in entry-level programs within miscellaneous and special training schools as well as training programs sponsored by ministries other than the Ministry of Education, Science and Culture. The proportion of students in formal vocational training may be overstated because some students in special training schools are enrolled in general education programs.

[4]The percentages reflect the status of 1989 high school graduates 2 months after graduation. The balance of graduates were either unemployed, deceased, or status unknown.

[5]The percentages understate the proportion of students who ultimately continue on to higher education. Many students spend an extra year in miscellaneous or special training schools preparing for university entrance exams. In 1984, about 30 percent of applicants to 4-year universities and 35 percent of entering students had graduated at least 1 year before applying to the universities (Leestma and Walberg, August 1992).

[6]Includes students participating in entry-level and postsecondary programs at miscellaneous and special training schools as well as training programs sponsored by ministries other than the Ministry of Education, Science and Culture. The proportion of students in formal vocational training may be overstated because some students in special training schools are enrolled in general education programs.

SOURCE: Ministry of Education, Science and Culture, *Statistical Abstract of Education, Science and Culture*, 1990 edition (Tokyo: Research, Statistics and Planning Division, 1990).

[91]Recent reforms in secondary education have tried to address this transfer issue by letting upper secondary schools have a "credit system" to facilitate credit transfer at least between departments in a school (Ministry of Education, Science and Culture 1990b).

Organization of Vocational Education

Vocational education is predominantly a postcompulsory education activity, although there are a number of options which bridge upper secondary and postsecondary curricula. Formal entry-level and advanced-level training programs are offered within upper secondary and postsecondary schools through Department of Labor employment training programs and within businesses.

Vocational Education Options Within the Education System

Formal vocational preparation courses of study are not offered until high school. However, within middle schools (grades 7–9), approximately 8 percent of the curriculum consists of prevocational coursework in industrial arts or homemaking. This amounts to 70 hours of industrial arts or homemaking in both the seventh and eighth grades, and 105 hours in the ninth grade.

Upper Secondary Options

In 1989, 74 percent of students in high schools pursued academic (mostly college preparatory) studies,[92] and 26 percent specialized in vocational education (table 2.9) (Ministry of Education, Science and Culture 1990b).[93] Vocational training occurs in two types of schools: high schools (comprehensive and vocational)[94] and vocational training schools,[95] which offer specialized training in one or more occupational area.[96]

Table 2.9—Percentage of upper secondary school students in Japan, by type of program: 1989

	Percent enrolled
Academic	**74.0**
Vocational	**26.0**
By type of vocational program	100.0
Agriculture	10.8
Industry	33.5
Business	40.0
Fishery	1.2
Home economics	9.2
Nursing	1.5
Other	3.9

SOURCE: Ministry of Education, Science and Culture, *Statistical Abstract of Education, Science and Culture,* 1990 edition (Tokyo: Research, Statistics and Planning Division, 1990), 46–47.

[92]Although only 30 percent of new upper secondary graduates enter colleges and universities, academic high schools are designed to prepare students for entrance into higher education. In fact, a school's reputation is based on its ability to place students in the top universities.

[93]Less than 1 percent of students were classified as pursuing "other" studies.

[94]Fifty-three percent of high schools offer only an academic curriculum; 31 percent offer both an academic and vocational curriculum; and 16 percent are purely vocational (McCormick 1988, 38).

[95]These include technical schools, special training schools, and miscellaneous schools, as discussed below. Miscellaneous and special training schools provide more specialized training in vocational areas that qualify students for national skill certificates and licenses.

[96]A fairly new and growing vocational option, technical college (*koto senmon gakko*), is available to students interested in becoming skilled technicians. Less than 1 percent of new lower secondary graduates enter this type of institution (Ministry of Education, Science and Culture 1990b). These predominantly public technical colleges recruit students for programs beginning in the 10th grade. Programs last approximately 5 years—3 years of high school and 2 years of postsecondary study. These technical colleges almost exclusively offer courses in engineering and merchant marine studies and serve mostly male students.

Postsecondary Options

Approximately one-third of all upper secondary graduates enroll in miscellaneous schools.[97] These schools offer both entry-level (upper secondary) and advanced-level (postsecondary) vocational programs in specific occupational fields,[98] providing a type of training not available in high schools and universities. Training is often fairly specific and aimed at preparing students for national licensing examinations (in subjects such as bookkeeping, automotive repair, or dressmaking). The majority of these schools offer only advanced-level (postsecondary) programs, and most are private—although some courses are available to upper secondary students. In 1990, 77 percent of the students enrolled in these types of schools were pursuing advanced courses, and 88 percent of these schools were private (Ministry of Education, Science and Culture 1990a).

One type of miscellaneous school are special training schools.[99] These schools are required to enroll 40 or more students, and courses must be at least 1 year in duration, with a minimum of 800 teaching hours. Special training schools offer 3-year courses to lower secondary graduates and 2-year courses to high school graduates in fields such as engineering, nursing, allied health fields, and home economics. Most special training schools are private. The few public institutions are administered by the Ministry of Education, Science and Culture, although the special training schools have far more autonomy in setting their curriculum than do public high schools and colleges. However, credits gained in these schools are not transferable toward a degree at a university or junior college.

Although there are special training schools at the upper secondary level, most of these schools offer postsecondary programs: 75 percent of students in special training schools are enrolled at the postsecondary level. Upper secondary special training schools[100] offer 3-year programs to lower secondary school graduates, while special training colleges (advanced-level special training schools)[101] offer 2-year postsecondary vocational programs to high school graduates.

Another vocational option within the educational system are programs offered at junior colleges. These colleges are administered by three different entities: the federal government, local governments, and private enterprises. Eighty-four percent of junior colleges are private institutions; 7 percent are national institutions;[102] and 5 percent are local institutions. These colleges predominantly serve women: in 1989, more than 90 percent of the enrollment was female (Ministry of Education, Science and Culture 1990b). Although the emphasis at most junior colleges is on liberal arts, the number of professional education programs has been increasing. Unlike junior colleges in the United States, junior colleges in Japan do not serve a transfer function into 4-year universities.

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[97] *Kakushu gakko.*

[98] Some special training schools also offer general education programs.

[99] *Senshu gakko.*

[100] *Koto senshu gakko.*

[101] *Senmon gakko.*

[102] The programs offered at national junior colleges are often related to those at national universities; 50 percent of the colleges coordinate their health science and medical technician programs with those at the national university; 25 percent coordinate their law and commerce programs; and 25 percent coordinate their engineering programs.

The most popular vocational programs in junior colleges include home economics (enrolling approximately 27 percent of all junior college students), and education (enrolling approximately 22 percent of all junior college students).[103] Another 10 percent of junior college students are enrolled in agriculture, health, and engineering programs (U.S. Department of Education 1987).

Vocational Training Programs Outside the Educational System

The Ministry of Labor operates public training centers that enroll approximately 300,000 students each year. The programs at these centers include basic training, skill improvement training, retraining for new occupations, and instructor training. Most students in these centers are older workers who want to acquire a national trade certificate or retraining for new jobs.[104] The Ministry of Labor provides training allowances for unemployed persons and financially assists small- and medium-size firms with their training programs.

In addition, approximately 150 vocational schools are operated by other ministries. The Ministry of Health oversees nursing schools; the Ministry of Transportation supervises seamen's schools; and the Ministry of Construction manages some training programs for the construction industry (McCormick 1988).

Most companies in Japan have new employee training programs geared toward high school and college graduates. Large companies, with more than 300 employees, often provide extensive, in-house continuing education and training programs for their workers.[105] However, these companies employ only 27 percent of the work force (U.S. Department of Education 1987).

School-to-Work Transition

Approximately 35 percent of high school students enter the work force directly after they graduate (table 2.10). High school guidance counselors primarily coordinate the job recruitment and placement of students. At the high school level, the government regulates the job recruitment process by limiting the provision of job placement assistance to only public and nonprofit institutions. Companies have limited access to potential workers. In fact, direct communication between businesses and high school students is prohibited, and companies must work through the schools and the Ministry of Labor Public Employment Security Office (PESO) to recruit students.[106] Moreover, companies can only recruit high school seniors, and they cannot begin to screen job applicants until October, midway through the school year.[107]

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[103]These programs offer mainly preschool education.

[104]These centers were first created in part to help lower secondary graduates who were nonskilled workers in their transition from compulsory schooling to work. However, since most lower secondary graduates continue on to some form of postcompulsory education, these centers have shifted their focus to retraining and updating skills.

[105]Training also takes place in smaller companies; larger companies are more explicit about training programs and often set aside and spend more resources on training.

[106]Companies must submit recruitment cards that describe job openings and each position's salary and benefits for PESO approval. These cards are then used by PESO and school counselors for job placement purposes.

[107]The school year in Japan starts in April.

Table 2.10—Percentage distribution of upper secondary students aged 18–19 in Japan, by activity immediately following graduation: 1989

	Percent enrolled
Higher education[1]	30.6
Vocational training	28.9
Employment	34.7
Other[2]	5.7

[1]Includes entrants to universities (undergraduate and short-term courses), junior colleges (regular and short-term courses), and advanced courses at upper secondary schools.
[2]Includes graduates who could not be found, or who were deceased or unemployed.

NOTE: May not sum to 100 percent due to rounding.

SOURCE: Ministry of Education, Science and Culture, *Statistical Abstract of Education, Science and Culture,* 1990 edition (Tokyo: Research, Statistics and Planning Division, 1990), 50–51.

From April to August, school counselors meet with students as well as company representatives to find placement matches. Counselors rank students for job examination slots, basing their decisions on student grades and other factors (school attendance record, club participation, and so on). In September, students submit job applications to companies, and in October, they are tested. (A company examination may include a written examination, an IQ test, a physical examination, and an interview.) School personnel work hard to place students and are available to assist with job placement or job mediation as needed by graduates and companies. Job placement at the postsecondary level is much more varied because companies can recruit students directly.

The majority of students planning to enter the work force after high school are placed in a job by mid-November (U.S. Department of Education 1987). In 1989, 86 percent of these students (that is, students seeking employment) were employed 2 months after graduation (Ministry of Education, Science and Culture 1990b).[108]

Vocational Education Curricula

Secondary

Within high schools, whether general, comprehensive, or vocational, the Ministry of Education, Science and Culture requires that students follow the "Course of Study for Upper Secondary Schools," which mandates that upper secondary education for all students include standard academic subjects such as math, Japanese, social studies, and science.[109] As a result, all

[108]Of the total graduate population, the unemployed represent about 6 percent.
[109]Compared with general track students, vocational students spend less class time on academic subjects. However, they still spend 16–18 hours a week in general education classes and are required to spend 9 hours per week in physical education, home economics (women only), health, music or art, and club activities. Their academic coursework tends to be less rigorous and is taught at a slower pace than the coursework of their peers in a general track.

high school curriculum in the first year is academic, and nearly two-thirds of a vocational student's schooling in the second and third years is devoted to standard academic subjects (U.S. Department of Education 1987). Students specializing in a vocational occupation must take no less than 30 out of 80 graduation credits in their subject specialization area.

Within comprehensive and vocational high schools, the vocational program is oriented toward broad career clusters, rather than being job specific. The broad occupational career areas include agriculture, industry, business, fishery, home economics, and nursing. Vocational high schools tend to be more specialized, focusing on industrial, commercial, or agricultural studies (McCormick 1988).

Postsecondary

The Ministry of Education, Science and Culture does not regulate the curriculum within special training and miscellaneous schools to the extent that it does in other upper secondary and postsecondary institutions. Curricula, especially in the special training schools, are more influenced by standards set by occupational qualification and certification processes.

The occupational programs offered by miscellaneous schools include bookkeeping, typing, automotive repair, computer techniques, dressmaking, and cooking. The duration of the program varies and can last anywhere from several months to several years. At the special training schools, programs are offered in engineering, agriculture, medical care, nursing, health, commerce, home economics, and culture/liberal arts.

Participation in Vocational Education

In 1989, 94 percent of middle school graduates advanced to technical schools and high schools,[110] while 2 percent of graduates enrolled in a vocational training program (Ministry of Education, Science and Culture 1990b). Of the 5.6 million upper secondary students in 1989, 26 percent pursued a vocational program area, and 74 percent pursued academic studies (Ministry of Education, Science and Culture 1990b).

Over the past decade, the overall proportion of high school students pursuing studies in an occupational field has decreased slightly—from 32 percent in 1980 to 26 percent in 1989. Among the vocational programs available to high school students in 1989, business and industry studies had the highest proportions of students enrolled. Business programs predominately enrolled women, with only 29 percent of men specializing in this area, and industry programs predominately enrolled men, with only 5 percent of women specializing in this area (Ministry of Education, Science and Culture 1990b).

Of high school students who graduated in 1989, 30 percent continued on to higher education (18 percent to a university and 12 percent to a junior college). Nearly the same proportion of graduates (29 percent) entered advanced-level vocational training programs. Thirty-five percent were employed within 2 months of graduation, and 6 percent were unemployed (Ministry of Education, Science and Culture 1990b).[111]

The total number of enrollees in miscellaneous and special training schools remained fairly steady throughout the 1980s. However, a greater proportion of these participants were enrolled in

[110]These schools include academic, comprehensive, and vocational high schools. As noted, while the comprehensive and vocational high schools offer vocational programs, these offerings only account for approximately one-third of students' curricula.

[111]Less than 1 percent were enrolled in other educational programs.

special training schools. In fact, the number of students who were enrolled in these schools increased by 71 percent from 1980 to 1989, while the number of students enrolled in other miscellaneous schools decreased by 39 percent. Thus, in recent years, the total number of students enrolled in special training schools has been greater than that in other miscellaneous schools (Ministry of Education, Science and Culture 1990b).

Similar patterns of participation by gender occur in miscellaneous and special training schools. While a slightly larger proportion of women (55 percent) participate in these programs, they tend to be clustered in certain fields. For example, in 1987, the two most popular disciplines in special training schools were engineering, with a female participation rate of 21 percent, and health occupations, with a male participation rate of 17 percent (McCormick 1989).

Vocational Education in the United Kingdom

The various education authorities within the United Kingdom—Department of Education and Science (England and Wales), the Welsh Office Education Department, the Scottish Office Education Department, and the Department of Education (Northern Ireland)—differ in the way they structure their education and training systems. This narrative focuses primarily on England and Wales except when noted.

Compulsory education in England and Wales spans 11 years for students, from age 5 until age 16. The education system is highly decentralized, with responsibility for management and control resting mainly with the local education authorities (LEAs), of which there are 117 in England and Wales. Most LEAs adopt two-tiered grade-level configurations—6 years of primary school and 5 years of lower secondary school.[112]

Recent educational reforms (The Education Reform Act, July 1988) broadened national responsibilities for educational programs, and established a national core curriculum and an assessment process for students during their years of compulsory education. The Act also conveys more budgetary authority to individual schools and, under certain circumstances, allows them the option of withdrawing from LEA control and becoming a grant-maintained school.

Approximately 90 percent of secondary students attend nonselective, comprehensive secondary schools (EURYDICE and CEDEFOP 1991). The remaining students attend selective schools,[113] mainly in the form of grant-maintained schools, grammar schools, secondary modern schools, and private institutions.[114]

While students can leave the education system at age 16, many remain in school until age 18 (figure 2.5). Secondary students, especially those intending to pursue upper secondary and higher education, take the General Certificate of Secondary Education (GCSE) examination after completing lower secondary school (usually around age 16).[115] Students who achieve a grade of A, B, or C on the GCSE examination and who are in an "academic track" spend 2 more years

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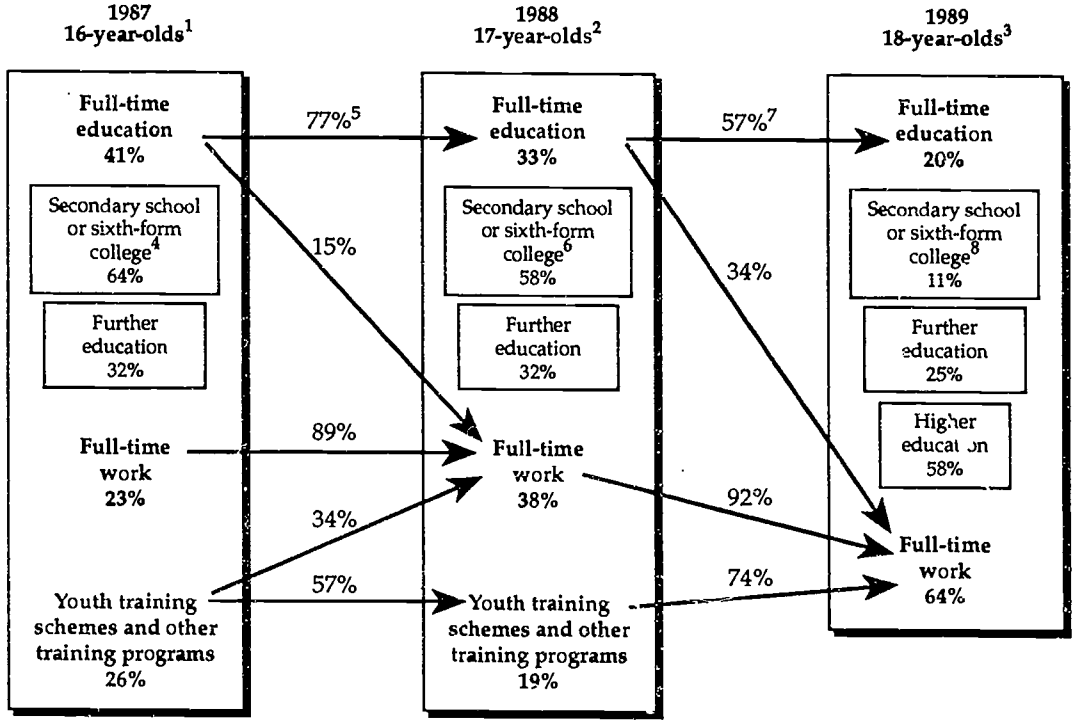
[112]In England, about 15 percent of students used to attend a three-tier school system consisting of primary school (3 to 5 years); middle school (4 years); and high school (2 to 4 years). However, this structure no longer exists.

[113]Until 1965, students were tracked into particular schooling opportunities based on tests administered at age 11. Those scoring in the highest quartile were admitted to grammar schools (college-prep curriculum), while others attended secondary technical or modern schools. Secondary technical schools offered curricula oriented toward occupational clusters, although still enabling students to undertake some form of postsecondary higher education. Today, these schools are rarely mentioned as an alternative for students because few, if any, exist in their original form. A recent British government initiative resurrected these institutions in the form of City Technical Colleges (CTCs), which are being piloted in 20 sites. These schools provide a broad-based secondary education for students aged 11–18 that incorporates a strong technical training element into the curriculum and primarily serves the needs of nonuniversity-bound youth (Edwards, Gewirtz, and Geoff 1992). Secondary modern schools, which exist today but are fewer in number, provide general secondary education for nonuniversity-bound youth, usually providing schooling until age 16.

[114]In 1987–88, 10 percent of elementary and secondary schools were private institutions (EURYDICE and CEDEFOP 1991).

[115]In 1988, the GCSE replaced the General Certificate of Education, Ordinary-level (GCE, O-level) qualification and the Certificate of Secondary Education (CSE) qualification. The GCSE exam is graded on a 7-point A–F scale, where a score of A–C represents the same competency level as a pass on the GCE, O-level exam. This certificate is the entry-level qualification for upper secondary (postcompulsory) education and training (Central Office of Information 1989).

Figure 2.5
ENGLAND AND WALES: Participation of 1987 16-year-olds in education and the labor force, 1987–89



[1]Percentages represent the proportion of the 16-year-old population participating in full-time education (41 percent), training (26 percent) and employment (23 percent) in 1987. Approximately 8 percent of the cohort was unemployed in each of the 3 years; the remaining young people include those working part time, working within the home, traveling, and so on.

[2]Percentages represent the proportion of the 1987 16-year-old cohort participating in full-time education, training, and employment in 1988 as 17-year-olds. As above, 8 percent of the cohort was unemployed, the remaining 2 percent include those young people working part time, working within the home, traveling, and so on.

[3]Percentages represent the proportion of the 1987 16-year-old cohort participating in full-time education, training, and employment in 1989 as 18-year-olds. As above, 8 percent of the cohort was unemployed; the remaining 8 percent include those young people working part time, working within the home, traveling, and so on.

[4]Students in secondary schools and sixth-form colleges were enrolled in postcompulsory programs mainly aimed at preparing them for A-level examinations. The remaining 4 percent of full-time students were enrolled in other schools.

[5]Percentages represent the activity status of 1987 16-year-olds in 1988 relative to their status in 1987. In this instance, 77 percent of 1987 16-year-olds who were enrolled in school full time in 1987 were enrolled full time in 1988; 15 percent had full-time jobs; and the remaining entered other activities such as youth training, working part time, working within the home, traveling, and so on.

[6]The remaining 6 percent of full-time students were enrolled in other schools.

[7]Percentages were based upon the activity status of 1987 16-year-olds in 1989 relative to their status in 1988. In this instance, 57 percent of 17-year-olds (1987 16-year-olds in 1988) who were enrolled in full-time education were enrolled in school full time in 1989; 34 percent worked full time; and the remaining 18-year-olds engaged in other activities such as youth training, working part time, working within the home, traveling, and so on.

[8]The remaining 5 percent of full-time students were enrolled in other schools.

SOURCE: Gill Courtenay and Ian McAleese, *England & Wales Youth Cohort Study: Report on Cohort III Sweep 3, 18–19 Year Olds in 1989* Sheffield: Research Management Branch, Employment Department, December 1991.

(ages 17 and 18) in secondary school or a "sixth-form" college, where they prepare for the General Certificate of Education at Advanced-level examinations (A-level exams), the traditional entry qualification for higher education.[116]

In 1992–93, nearly 80 percent of 16-year-olds, about 67 percent of 17-year-olds, and 46 percent of 18-year-olds were enrolled in school. In 1992–93, 71 percent of 16-year-olds, 55 percent of 17-year-olds, and 34 percent of 18-year-olds were enrolled in *full-time* schooling (Department for Education 1993).

Focusing strictly on those enrolled in schools *full time* masks the degree to which young people really participate in compulsory education and training. In fact, an increasing proportion of those who have entered the labor force participate in further education as part of their employment training or attend further education classes at night while working full time (Kerchoff 1990). In 1992–93, 8 percent of 16-year-olds, 11 percent of 17-year-olds, and 12 percent of 18-year-olds attended school on a part-time basis (Department for Education 1993).

Organization of Vocational Education

Vocational education and training are student options at the age of 16. Programs are offered both within and outside the educational system.

Vocational Education Options Within the Educational System

There are two types of postcompulsory education: further education and higher education. Further education includes all upper secondary-level programs, which mainly prepare 16- to 18-year-olds for entry-level vocational qualifications or A-level or university entrance examinations. Further education is provided by a broad variety of schools and institutions: secondary schools, sixth-form colleges, tertiary colleges, technical colleges, and colleges of further education. Higher education includes academic degree programs in universities and advanced-level occupation and technical degrees and certificates.

Within the educational system, vocational education takes place primarily in tertiary colleges, technical colleges, and colleges of further education. Two levels of vocational education are offered—nonadvanced courses or upper secondary programs and advanced courses or postsecondary programs. For the most part, vocational programs prepare students for vocational qualification examinations. In 1989, 33 percent of 16- through 18-year-olds were enrolled in further education. A majority of these students were preparing for vocational qualifications (table 2.11) (Department of Education and Science 1992).[117] Table 2.12 shows the percentage of 16- through 18-year-olds in England participating in different academic and vocational curricula.

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[116]A-level examinations used to be the prerequisite to a postsecondary degree program. Universities required a minimum of two A-level passes for entrance into postsecondary studies; more commonly students entered with at least three A-level passes of high scores. However, recent reforms have opened access to higher education through advanced-level vocational qualifications and bridging programs.

[117]Further education includes students preparing for university-qualifying A-level examinations and other upper secondary academic programs. Thus, not all further education students are vocational students.

Table 2.11—Percentage distribution of students aged 16–18 in the United Kingdom participating in further education, by type of program certification: August 1989

	Students aged 16–18
Of those enrolled in further education[1]	
Percent enrolled full time	**42.1**
Full time by type of program certification	
BTEC/SCOTVEC[2]	38.9
Royal Society of Arts	2.7
City and Guilds	16.0
Academic secondary diploma	30.0
Other specified courses[3]	12.4
Percent enrolled part time (day)	**39.2**
Part time (day) by type of program certification	
BTEC/SCOTVEC[2]	32.7
Royal Society of Arts	3.8
City and Guilds	51.8
Academic secondary diploma	6.7
Other specified courses[3]	5.0
Percent enrolled part time (evenings)	**18.7**
Part time (night) by type of program certification	
BTEC/SCOTVEC[2]	6.8
Royal Society of Arts	13.2
City and Guilds	10.9
Academic secondary diploma	57.6
Other specified courses[3]	11.5

[1]Thirty-three percent of 16- through 18-year-olds in the United Kingdom were enrolled in further education.

[2]SCOTVEC is the Scottish equivalent of the Business & Technician Education Council's (BTEC) certificate.

[3]London Chamber of Commerce and Industry's qualifications are included in this category.

NOTE: May not sum to total due to rounding.

SOURCE: Department of Education and Science, Government Statistical Service, *Education Statistics for the United Kingdom,* 1991 Edition (London: HMSO, 1992).

Table 2.12—Percentage of 16- through 18-year-olds in England, by participation in education: 1992–93 (estimated)

	Age		
	16	17	18
Percent in school	**79.6**	**66.5**	**46.0**
Full-time schooling	**71.2**	**55.2**	**34.0**
Academic coursework			
Higher education	—	0.3	16.3
A-level	35.2	32.9	6.3
GCSE	10.1	2.1	0.5
Vocational Coursework			
BTEC (National)	6.7	9.7	5.6
Other*	18.6	9.8	5.0
Part-time schooling	**8.4**	**11.3**	**12.0**

—Not applicable.
*Other courses include BTEC First, C&G, and RSA.

SOURCE: Department for Education, Government Statistical Service, "Participation in Education by 16–18 Year-Olds in England: 1979/80 to 1992/93," *Statistical Bulletin,* Issue No. 16/93 (London: June 1993).

Vocational Education Options Outside the Educational System

Several vocational training programs are provided outside the education system. For example, the Department of Employment administers two school-to-work transition programs: the Youth Training program (a major training option for 16- and 17-year-olds), and Compacts.[118] In addition, trade guilds operate apprenticeship programs, and some of the larger corporations and businesses provide on-the-job training.

Youth Training (YT) Program

The Youth Training (YT) program was developed in response to rising youth unemployment and was targeted at young people who did not wish to pursue postcompulsory education. It recently evolved from the Youth Training Scheme (YTS), which operated on an apprenticeship model, placing participants in work situations and requiring that employers provide 20 weeks of "off-the-job" training for participants. Youths aged 16 attended a 2-year program, and 17-year-olds a 1-year program.[119] Under YT, the program has become more flexible for companies and organizations that provide youth training placements. For example, the government does not require "off-the-job" training and is more flexible about the type of placement and the duration of training; instead, it focuses upon "outputs." All apprenticeships offered under YT should lead to a National Vocational Qualification (NVQ). In fact, funding for these apprenticeships is partially dependent upon the rate of NVQ attainment. During training, participants receive a tax-free training

[118]The government is using these programs to address the high unemployment rate among young people in Britain. In 1980, one-third of unemployed males were unskilled laborers, and more than 40 percent of the unemployed were under the age of 25 (Postlethwaite 1988).

[119]The value of training received under YTS had been questioned because the program was highly criticized for its lack of quality control. In fact, research looking at the external market return to YTS did not show great results (Raffe and Rumberger 1992).

allowance. In 1990, 23 percent of 16-year-olds and 21 percent of 17-year-olds participated in a YTS program (table 2.13) (Department of Education and Science 1992).

Table 2.13—Percentage of 16- through 18-year-olds in Great Britain, by participation in education and training schemes: January 1990

	Age		
	16	17	18
Full-time schooling	**52**	**38**	**21**
Schools	35	23	3
Further education	17	14	8
Higher education	—	1	11
Youth Training Scheme	**23**	**21**	**2**
Other*	**25**	**41**	**77**

—Not applicable.
*Includes students enrolled part time, those employed outside of the Youth Training Scheme (YTS), and those who are unemployed.

NOTE. Great Britain is composed of England, Wales, and Scotland.

SOURCE: Department of Education and Science, Government Statistical Service, *Education Statistics for the United Kingdom,* 1991 Edition (London: HMSO, 1992).

Youth Credits, which are essentially training vouchers that 16- and 17-year-olds can use to purchase training from an employer or organization, are currently being piloted with plans for nationwide implementation by 1996. This voucher program will replace YT.

Compacts

In 1988, the Compacts program was introduced as part of an "inner-city" initiative. Compacts are formal partnerships between schools and local businesses and corporations that agree to work together with students in order to provide them with school-to-work transition options. Schools provide opportunities for students to gain relevant work skills, and businesses provide training or jobs after they have successfully completed the program. Students commit to meeting the performance standards set by the program. To date, 62 Compacts have been established involving more than 700 schools (Morris, Saunders, and Schagen 1992).

Vocational Qualifications

No single set of vocational qualifications exists in England and Wales. At present, both the government and some professional organizations offer vocational certificates. These certifications (or diplomas) are designed to parallel the academic certification system (that is, general, advanced, and higher degrees). However, programs are not standardized across the country. For example, in

the area of retail, there are four separate professional bodies awarding certificates at the "craft" level (Steedman 1992). Currently, there are almost 1,400 different occupational qualifications (Parkes 1991).[120]

National Vocational Qualifications

There are two national vocational qualifications: the National Vocational Qualification (NVQ) and the Certificate of Prevocational Education.[121]

The NVQ is a new kind of qualification established in 1986 and is just being implemented. Ultimately, it will consist of five levels of expertise within each vocational area, each corresponding to increasing skills and competencies in a given vocation. Students will gain credit toward qualification by participating in particular education and training programs.[122] These qualifications are meant to be a vocational counterpart to the GCSE and A-level exams.[123] In essence, postcompulsory training courses must meet NVQ criteria before these awards become nationally recognized vocational qualifications. A National Council for Vocational Qualifications (NCVQ) was established by the government to create and monitor the 5-level competency framework.

Recently, the government introduced a new qualification, the General National Vocational Qualification (GNVQ), which serves as an alternative to the A-level exam. The GNVQ differs from the NVQ in that it does not imply that a recipient can competently perform the tasks of an occupation immediately after receiving the qualification. Instead, the qualification is broader and indicates that the recipient has achieved a foundation of basic skills, knowledge, and understandings that underpin a certain range of occupations.

The Certificate of Prevocational Education, introduced in 1985, is a vocational counterpart to the GCSE. Those preparing for this qualification sample different vocational areas within an "activity-based" learning program. Students can extend their program of studies for 2 years and qualify for an A-level exam in a specific vocational area.

Four professional organizations provide credentialing: the Business and Technician Education Council (BTEC), the City and Guilds of London Institute (C&G), the Royal Society of Arts (RSA), and the London Chamber of Commerce and Industry (LCCI).[124]

- *BTEC*—offers certificates and diplomas in business and technical subjects at three levels: 1) the First Certificate and Diploma (GCSE level); 2) the National Certificate and Diploma (A-level); and 3) Higher National Certificates and Diplomas. Programs leading to certificates are 2 years in duration and involve in-school coursework and on-the-job training. Programs leading to diplomas require 2 years of full-time schooling. (There is also a 3-year option for those who want to work part time.)

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[120]Institutions that provide further education decide the mix of vocational programs and credentials they will offer among the many different occupations.

[121]These options were introduced as part of a vocational training reform that sought to unify the myriad of vocational qualifications, and to provide uniformity, coherence, and a bridge between academic and vocational areas.

[122]The impact of NVQ is not clear. Some employers who are not familiar with NVQ competencies continue to use individual professional qualifications as indicators of capabilities.

[123]For example, a level-2 NVQ will be equivalent to four GCSEs, and a level-3 NVQ will be equivalent to two A-level exams. Presently, there are 285 NVQ qualifications, covering approximately 60 percent of the working population that fall into the first four levels of competencies.

[124]There are other smaller organizations that offer certificates and qualifications, but the four mentioned above are the main sources of nationally recognized qualifications.

- *C&G*—offers qualifications in technical, industrial, and commercial fields. Programs leading to C&G qualifications are provided in colleges of further education, training centers, and large companies. C&G offers a variety of skill-level certificates; however, the organization is mainly concerned with certifying basic and craft vocational education.
- *RSA*—offers three levels of qualifications (elementary, intermediate, and advanced) in business and secretarial skills.
- *LCCI*—similar to RSA, offers three levels of qualifications in commercial subjects (for example, foreign languages and office technology).

Vocational Education Curricula

All secondary students aged 11–14 are required to study core and foundation subjects: English, math, science, technology, history, geography, music, art, physical education, and a foreign language. From the ages of 14–16, students take the three core courses (English, mathematics, and science), as well as continuing foundation courses in technology, modern languages, physical education, and either history or geography. The Department of Education has set performance standards for each major national curriculum subject area, and plans are currently being made to assess students against these standards at "key" stages.

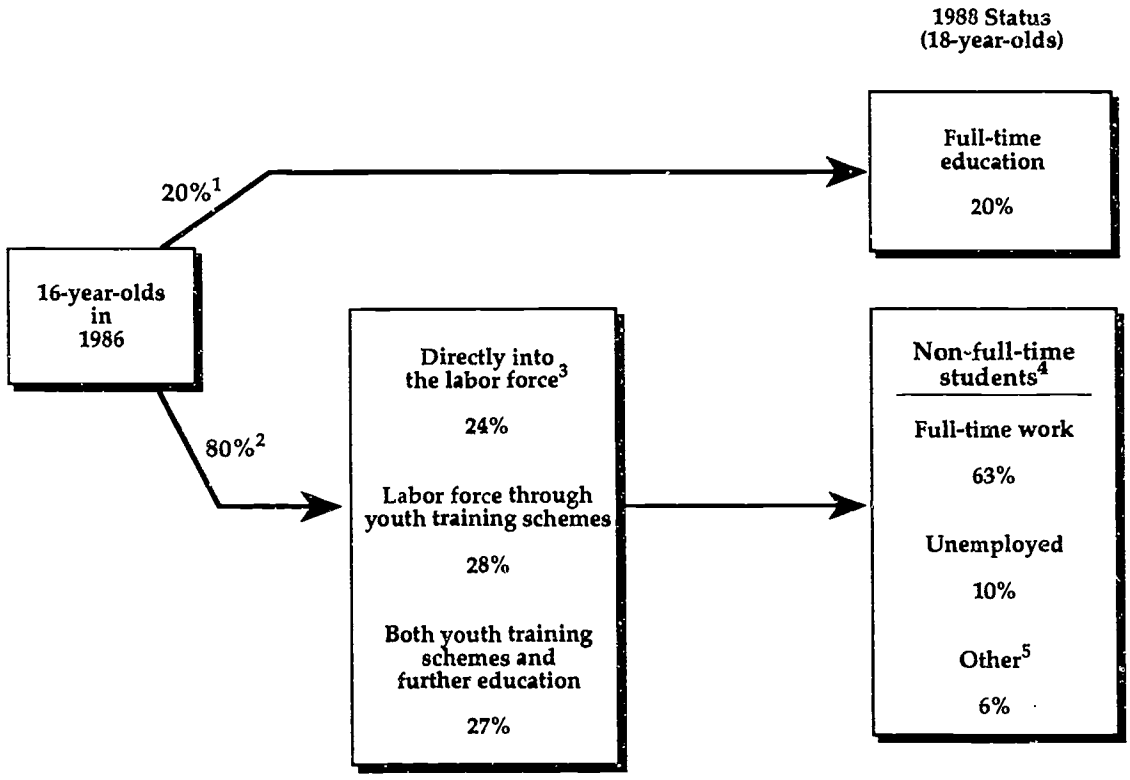
In response to an ongoing recession and high youth unemployment rates, the school curriculum now includes more work-readiness and occupational skill training than it had previously. In 1983, the Department of Employment introduced the Technical and Vocational Education Initiative (TVEI), involving reform designed to make the secondary curriculum more relevant to the world of work, impart problem-solving skills, and encourage creativity, enterprise, and initiative among students. These programs were designed and administered by LEAs to include a vocational and work-experience component that would lead to a nationally recognized certificate or professional qualification. While every secondary school now has a TVEI program, the future of these efforts is contingent upon the continued availability of special funding.

Participation in Vocational Education and School-to-Work Transition Programs

In 1992–93, 25 percent of 16-year-olds, 20 percent of 17-year-olds, and 11 percent of 18-year-olds in the United Kingdom were enrolled in full-time vocational education (Department for Education 1993). In 1990, 15 percent of 16- to 18-year-olds were enrolled in the YTS (Department of Education and Science 1992). In 1988, 27 percent of 18-year-olds had participated in both the YTS and further education (figure 2.6).

Figure 2.6

ENGLAND AND WALES: Status of 1986 16-year-olds 2 years later at age 18



[1]Percentage represents the proportion of 1986 16-year-olds who were still in full-time education in 1988.

[2]Percentage represents the proportion of 1986 16-year-olds who had left full-time education by 1988.

[3]Percentages represent the routes and activities that 1986 16-year-olds had taken after they left full-time education.

[4]Percentages represent the status in 1988 of 1986 16-year-olds who were not enrolled full time in school.

[5]The "other" category includes those working part time, on vacation, working in the home, and so on.

SOURCE: Nicholas Sime, Charles Pattie, and John Gray, *England & Wales Youth Cohort Study: What Now? The Transition From School to the Labour Market Amongst 16 To 19 Year Olds*, Sheffield: Employment Department Group Training Agency, September 1990.

Data from the Youth Cohort Surveys show increasing participation in full-time education. In 1987, 41 percent of the 16-year-olds were enrolled full time in school, as were 58 percent of the 16-year-olds in 1991. (For information on these surveys, see appendix A.) However, the participation of 16-year-olds in YT (or previously YTS) has declined from 1987 to 1991. In 1987, 26 percent of 16-year-olds reported participating in YTS, while in 1989 this percentage declined to 22 percent. By 1991, only 14 percent of the 16-year-olds reported participating in YT (Courtenay and McAleese, July 1993; Courtenay and McAleese, August 1993).[125]

In 1988, more than half of the 16-year-olds surveyed in 1987 were still in school or training and had not entered the work force. Among these youths, 33 percent were enrolled in full-time education, and 18 percent were participating in YTS. Only 38 percent of them were employed full time. However, by 1989, 64 percent were employed full time, with 20 percent enrolled in full-time

[125]By 1991, YTS had been transformed into YT.

education and only 1 percent participating in YTS. About 40 percent of this cohort had gained a vocational qualification. Of those with qualifications, about 75 percent were employed full time; just over half held a C&G qualification; 31 percent held an RSA qualification; and 18 percent held a BTEC qualification (Courtenay and McAleese 1991).

The National Children's Bureau of London conducted a perinatal mortality survey of a cohort of children born in the first week of March 1958. Since then, several follow-up surveys of this cohort have been conducted. The most recent follow-up for which data are available was conducted in 1981 when the cohort was 23 years old. (For more information on this survey, see appendix A.) At the time of the survey, more than half of the cohort had at least one upper secondary qualification. Of these 23-year-olds, 22 percent had their highest level of qualification at the upper secondary level, 13 percent at the postsecondary level, and 16 percent at the higher or advanced technical level. Of those whose highest level of qualification was upper secondary, about half had received an academic qualification, while the other half had obtained a vocational qualification. At the postsecondary level, 87 percent had received their qualification in a vocational subject area, and 13 percent in an academic area. At the higher/advanced technical level, 78 percent had received their qualification in an academic subject area, while the remainder had received it in a vocational subject area (Kerchoff 1993).

Vocational Education in the United States

Education in the United States takes place in a highly decentralized context in which states and local education authorities exercise considerable autonomy and authority for establishing requirements for students, teacher certification, governance, and financing. Compulsory education requirements vary, but generally run from around age 6 to 16.

There are a variety of grade-level patterns in schools, two of which are particularly common: kindergarten plus 6 years of elementary school, followed by 3 years of junior high school, and 3 years of high school; or kindergarten plus 4 or 5 grades, a 3- or 4-year middle school, and a 4-year high school. The vast majority of students attend publicly supported nonselective schools, while about 10 percent of elementary and secondary students attend private institutions, many of which are religiously affiliated.

The U.S. education system is unique in that it provides students with multiple opportunities to change the course of their education. Secondary students are not generally placed in strict tracks. Instead, they are able to explore various curricular areas in both vocational and academic education. For example, a secondary student who took primarily college preparatory courses can switch to taking courses designed to prepare one for an occupation after graduation. A student who concentrated in vocational education at the secondary level can enroll in academic courses at a postsecondary institution that enrolls all applicants with a high school diploma, and can eventually complete a baccalaureate degree.

Vocational education in the United States is a multifaceted enterprise. Although primarily a public activity at the secondary level, vocational education constitutes an important part of the curriculum in both public and private postsecondary institutions. Students at both levels participate to varying degrees, with some electing to take one or more courses, others completing full programs preparing them for employment, and still others earning diplomas, certificates, or degrees.

Organization of Vocational Education

Introductory vocational education and training are generally offered for the first time in grade 7, and are primarily school based. Occupation-related vocational education is usually not offered until high school and much of it takes place at the postsecondary level. Vocational education continues to be primarily school based through the postsecondary level.

Organization of Vocational Education at the Secondary Level

Most vocational education is offered at the secondary level in grades 7 through 12, chiefly through the public school system. Specific course offerings vary by district and even by school, with some locales offering only a few courses and others providing an extensive array of vocational–technical programs. Nonoccupationally specific courses, such as courses in consumer and homemaking education and courses teaching general labor market skills, are taught throughout the secondary years, while occupationally specific courses are generally reserved for grades 10 through 12.

Public vocational education is delivered through several different institutional arrangements, the most common including comprehensive high schools, part-time area vocational schools, and

full-time vocational high schools. The term "comprehensive high school" refers to the typical U.S. public high school. Comprehensive high schools offer both academic and vocational courses. The vast majority of instruction in vocational education takes place in comprehensive high schools, although most of these schools focus primarily on teaching academic subjects.

Area vocational schools provide a centrally located vocational facility and are shared by two or more "feeder" high schools. Students attend the area vocational school for part of the day to receive their vocational instruction, while pursuing their academic studies at their home high school. Under this arrangement, occupationally specific courses are generally taught at the area vocational school, while nonoccupationally specific vocational education courses, such as home economics and some keyboarding or introductory computer courses, are taught at the home high school. Full-time vocational high schools, on the other hand, offer a complete program of academic and vocational studies. This type of arrangement is often found in large cities. Full-time vocational high schools differ from comprehensive high schools in that their primary focus is vocational rather than academic, and they are often organized around a particular industry, such as aviation or health.

Organization of Vocational Education at the Postsecondary Level

Since the purpose of vocational education has been defined in federal legislation as preparing students for employment that does not require a baccalaureate or advanced degree, postsecondary vocational programs generally lead to an associate degree or certificate. Vocational education at this level is delivered through a variety of public and private institutions. Although most postsecondary vocational education is provided by less-than-4-year postsecondary institutions that do not offer baccalaureate degrees, some 4-year colleges and universities do offer certificates and associate degrees in vocational areas.

In 1989, almost 8,000 postsecondary institutions offered vocational education in the United States (Hoachlander et al. 1992). Approximately two-thirds of these institutions were private, for-profit. The public 2-year institution was the next most common type of institution offering vocational education programs, followed by private, nonprofit less-than-4-year institutions, 4-year institutions, and public vocational–technical institutes. However, since the size of institutions varies considerably, the number of schools does not reflect the number of students being served by each institutional type.

Private, for-profit institutions offer a variety of vocational programs ranging from very short certificate programs (6 weeks, for example) to 2-year associate degree programs. Public 2-year institutions typically offer 2-year associate degree programs and certificate programs of up to 2 years in duration. Public vocational–technical institutes differ from public 2-year institutions in that the institutes generally do not award associate degrees and are more likely to provide certificate programs lasting 1 year or less. Finally, some 4-year institutions offer programs leading to short- and long-term certificates or to an associate degree. While public 2-year institutions and 4-year institutions generally offer programs of study in both academic and vocational areas, vocational–technical institutes and private, for-profit schools almost exclusively offer vocational education.

Vocational Education Curriculum

Secondary Level

States require students to take certain numbers of courses, as well as certain numbers of courses in specific areas in order to earn a high school diploma. Requirements have been

established in mathematics, science, and English in all states; most states have also set standards in history and social studies; and some have requirements for foreign language, life skills, and fine arts. These requirements, which are primarily academic subjects, must be achieved by all students, including those who are concentrating on vocational options.

One authority in the vocational education research field has divided the secondary vocational curriculum into three curricular areas for research purposes: 1) consumer and homemaking education, 2) general labor market preparation, and 3) specific labor market preparation (Hoachlander 1989; Hoachlander 1994; and Hoachlander et al. 1992). Consumer and homemaking education provides students with training and skills related to home and family life. Courses include instruction in the areas of food and nutrition, individual and family health, consumer education, family living and parenting education, child development and guidance, housing, home management (including resource management), and clothing and textiles.[126] General labor market preparation teaches skills that can be applied broadly to various personal or occupational settings, including courses such as beginning typing, industrial arts or technology education, work experience and career exploration, business math, and business English. Grouped together, general labor market preparation and consumer and homemaking courses make up the nonoccupationally specific vocational education curriculum. In contrast, specific labor market preparation includes introductory, advanced, and elective courses in seven occupational areas: agriculture, business, marketing and distribution, health, occupational home economics, trade and industry, and technical and communication. Personal health courses that teach students about taking care of themselves are not considered part of the vocational curriculum.

Students who concentrate in vocational education participate in only slightly fewer academic courses than students without such a concentration. However, students who concentrate in vocational education participate in considerably fewer advanced academic courses, such as chemistry and physics (Hoachlander 1992).

Postsecondary Level

Unlike secondary vocational education, postsecondary vocational education in the United States offers only an occupationally specific curriculum.[127] Postsecondary vocational education includes seven broad categories of occupational courses: agriculture, business and office, marketing and distribution, health, home economics, trade and industry, and technical education. These categories of vocational courses correspond to the seven program areas of specific labor market preparation at the secondary level, although the postsecondary programs generally prepare students for more advanced employment opportunities.

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[126]The Carl D. Perkins Vocational and Applied Technology Amendments of 1990, Public Law 101–392, sec. 311.

[127]Although postsecondary vocational education courses are organized into occupationally specific programs, students may enroll in these courses for a variety of personal and occupational reasons. In addition, adult or continuing vocational education in the United States encompasses general labor market courses such as personal typing and occupationally specific courses. However, these courses differ from postsecondary vocational education courses in that they generally are not offered for credit. Adult or continuing vocational education may be delivered through secondary or postsecondary institutions or through other arrangements.

Participation in Vocational Education

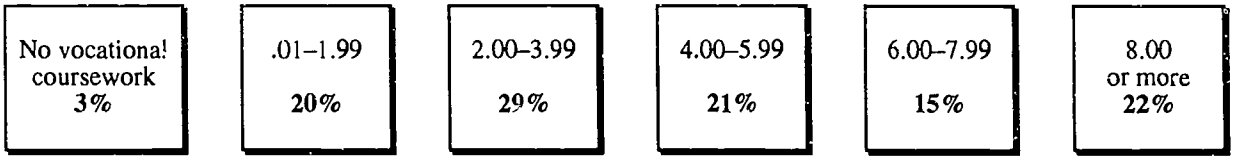
Secondary Level

Many students in the United States participate in vocational education, but only a small proportion complete a sequence of vocational credits in one occupational area. In 1990, about 97 percent of all public high school graduates completed at least one course in vocational education during their high school careers (U.S. Department of Education 1993).

A significant proportion of secondary students can be classified as participating heavily in vocational education; that is, they earn four or more credits in specific labor market preparation courses.[128] Twenty-eight percent of all 1990 public high school graduates completed the equivalent of four courses that met for a full year, one period per day. However, these participants did not necessarily take all four credits in the same occupational program area. About 60 percent of these heavy participants concentrated at least four credits in one labor market area, and fewer than one-third both earned four credits in one area and completed two credits at an advanced level (U.S. Department of Education 1993). Figure 2.7 shows the percentage of 1990 public high school graduates by the number of credits they accumulated in vocational education coursework during grades 9–12.

Figure 2.7

UNITED STATES: Percentage of 1990 public high school graduates, by number of credits accumulated in vocational education coursework during grades 9–12



NOTE: Total does not sum to 100 percent due to rounding.

SOURCE: National Assessment of Vocational Education, unpublished tabulations.

Over the last two decades, business has been the most popular specific labor market program at the secondary level. More than one-half of 1992 high school graduates took at least one course in this subject area. Business was followed in popularity by trade and industry and technical and communication programs (U.S. Department of Education 1994a).

The federal government provides some financial support for vocational education in the United States, although the vast majority of funding comes from state and local governments. One priority of the federal funds is to serve students who are members of special populations, particularly students with disabilities and limited English proficiency, at both the secondary and postsecondary levels. Students with disabilities who are enrolled in secondary education are more likely to participate heavily in vocational education than students without disabilities (Hoachlander et al. 1992). Students with disabilities and students with a language other than English spoken at home who were enrolled in postsecondary education participated in vocational education at approximately the same rate as other students (Hoachlander 1992).

[128]The term "credits" here refers to Carnegie units. A Carnegie unit is a standard of measurement used for secondary education that represents the completion of a course that meets one period per day for 1 year.

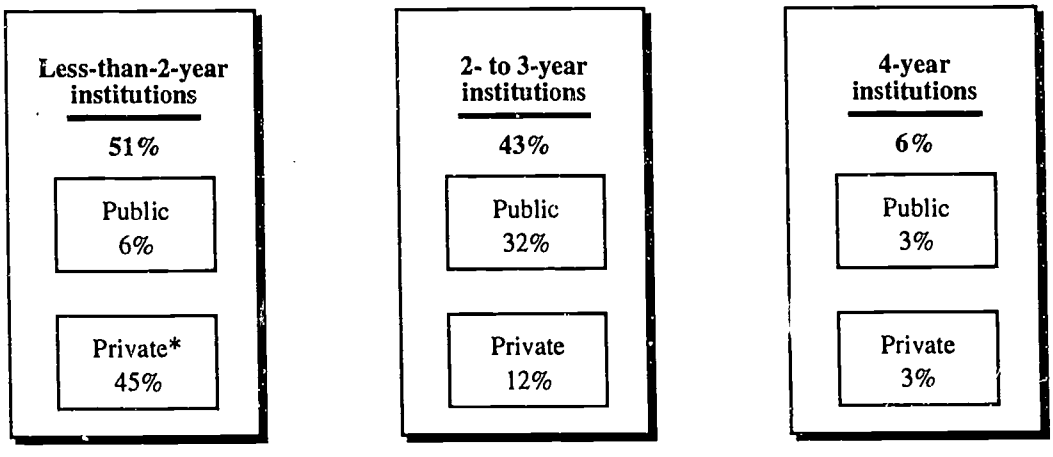
Over the past decade, the average number of credits that high school graduates earned in vocational education declined, and graduates completed a smaller proportion of all their specific labor market courses in advanced courses. The average number of credits that graduates earned in vocational courses declined by 11 percent from 1982 to 1990 (U.S. Department of Education 1994b). Moreover, the percentage of high school graduates earning at least four credits in specific labor market program areas who earned four credits in a single specific labor market program area with at least two of those credits in advanced courses decreased from 41 percent in 1982 to 29 percent in 1990 (U.S. Department of Education 1994b). This may be related to increased graduation requirements in academic subjects in some states. Between 1982 and 1987 public high school graduates increased the average total number of course credits they earned, and increased the average number of credits they earned in such subject areas as math, science, English, social studies, and foreign language (U.S. Department of Education 1992).

Postsecondary Level

In the fall of 1990, about 6 percent of the entire U.S. population aged 18–34 were taking vocational courses.[129] Almost one-half of these students were taking their vocational courses at public 2-year colleges, with most of the remaining students taking courses at a vocational, trade, or business school; a 4-year postsecondary institution, or from an employer (Hoachlander et al. 1992). Figure 2.8 shows the percentage of less-than-4-year vocational degrees and certificates awarded in 1988–89, by type and control of institution.

Figure 2.8

UNITED STATES: Percentage of less-than-4-year vocational degrees and certificates awarded in 1988–89, by type and control of institution



*While this represents the largest proportion of program completers, in 1989–90 only 22 percent of all students enrolled in vocational nonbaccalaureate studies attended private less-than-2-year institutions, 1989–90 National Postsecondary Student Aid Study (NPSAS: 90).

SOURCE: Hoachlander, et al., *Vocational Education in the United States: 1969–1990* (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 1992), 112–115.

[129]Only civilian, noninstitutionalized 18- through 34-year-olds who were not in high school are included in the analysis. Vocational course taking in this instance includes courses that lead to an occupational associate's degree or certificate, as well as other business, vocational, technical, secretarial, trade, or correspondence courses whether or not they are taken for credit.

When focusing on the postsecondary student population nationally, vocational education plays an even more important role. Students enrolled in less-than-4-year postsecondary institutions routinely take vocational education courses. Of the 1980 high school seniors enrolled in public 2-year postsecondary institutions by 1984, about four-fifths had taken at least one course in the vocational education curriculum. Similarly, of those students enrolled in private less-than-4-year institutions, almost nine out of ten took one or more courses in vocational education. At public vocational–technical institutes and private proprietary schools, virtually every student enrolled took courses in vocational education (Hoachlander et al. 1992). Furthermore, postsecondary students at all socioeconomic and academic ability levels were equally likely to participate in vocational education, as were handicapped and nonhandicapped students (Hoachlander et al. 1992).

The pattern of student enrollment in postsecondary vocational programs is similar to that of program enrollment at the secondary level. Of 1980 high school seniors taking at least one vocational course at a public 2-year institution by 1984, about one-half had taken a business course. Computers/data processing was the second most popular program, followed by home economics.

Student Outcomes

Secondary Level

Students who take more vocational education courses in high school are more likely to be employed full time after graduation. Specifically, those 1982 public high school graduates who had completed the equivalent of eight or more credits in vocational education and who were not enrolled in postsecondary education 6 months after graduation were one and a half times as likely to be employed full time as graduates who had completed the equivalent of less than two vocational credits and were also not participating in postsecondary education (50 percent versus 34 percent). In addition, those students who participated heavily in vocational education were less likely to be employed part time than graduates with little vocational coursework (15 percent versus 25 percent) (Hoachlander et al. 1992). Equally important, those who earned many vocational credits in a coherent program of study were more likely to find jobs utilizing their training than were those with many vocational credits in a variety of fields (U.S. Department of Education 1993).

Postsecondary Level

Participation in vocational education at the postsecondary level does not appear to affect the short-term earnings of former students. Former postsecondary students who earned varying numbers of vocational credits in public 2-year institutions in the early 1980s earned roughly the same hourly wages 6 months after their last enrollment in a public 2-year institution. Students employed either full time or part time earned about $5.00 an hour, and students with more vocational credits earned just as much as those with fewer credits. However, any benefits in

earnings due to greater vocational course taking may take longer than 6 months to appear; in other words, course taking may not affect starting salaries as much as it may influence future earning potential (Hoachlander et al. 1992).[130] Further, with regard to economic outcomes, students who attended community colleges and undertook vocational training were more likely to be employed and were more likely to utilize their vocational credits than were trainees from other kinds of institutions (U.S. Department of Education 1993).

[130]It is also possible that there are few economic advantages to the accumulation of more academic or vocational credits per se. It has been hypothesized that the major economic outcome of a college education is its credentialing or labeling consequences. Differences in potential earnings might arise, other things being equal, not only because further education imparts useful knowledge to workers but also because employers use educational attainment, such as degrees or certificates earned, as a convenient screening device for filtering persons into specific jobs. Incremental increases in credits earned short of actual degree attainment, therefore, may not influence earning potential. See G.K. Douglass, "Economic Returns on Investments in Higher Education," in *Investments in Learning*, ed. H. Bowen (San Francisco: Jossey-Bass Publishers, 1977).

Summary and Conclusion

Systems of vocational education and training are rooted in national traditions. Predominant mechanisms and processes of training reflect differing views of how to best develop work-related skills among the young. Some countries organize vocational education and training around in-school programs, others around the workplace and on-the-job apprenticeships, and others combine both. While some countries focus on classroom instruction as a primary way of preparing and credentialing in vocational areas, other countries emphasize hands-on skill building with limited technical classroom training. Across systems, vocational education plays a greater or lesser role, compared with a general academic preparation. Differences from country to country reflect philosophies of education and different perspectives regarding how much emphasis should be placed on vocational preparation in contrast to traditional academics. Furthermore, some countries have a long tradition of cooperation among employers, unions, and schools that creates a particular vocational education and training environment. In other countries, vocational education and training are not regarded as highly as academic education—that is, some systems are basically organized to prepare students for postsecondary education, and issues of work force preparation receive less attention.

Despite sharing high levels of development, the G-7 countries have approached the process of vocational education and training in very different ways. Table 2.14 summarizes the characteristics of each country's programs. While a few commonalities are evident, it is the differences that are most apparent. The narratives in this chapter were designed to provide an essential context for evaluating data on vocational education and training and the comparability of data across educational systems.

Table 2.14—Summary of vocational education and training options* in G-7 countries

Country	Primary Means of Vocational Education and Training (Level)	Locus of Training	Vocational Certification or Qualification Offered
Canada	Community colleges (postsecondary)	School-based	Provincial diploma or certificate
France	Vocational high school (upper secondary) (*Lycée*)	School-based	National upper secondary vocational certificate (CAP)
			National upper secondary occupational certificate (BEP)
			National vocational high school diploma (BP)
Germany	Dual system (upper secondary)	Both firm-based and school-based	National industry & guild certification (journeyman, skilled blue- and white-collar workers)
	Full-time vocational schools (upper secondary)	School-based	(as above)
	Part-time vocational schools (upper secondary)	School-based	(as above)
Italy	Technical school (upper secondary)	School-based	National technical school leaving certificate
	Vocational school (upper secondary)	School-based	National vocational school leaving certificate
Japan	Comprehensive and vocational high schools (upper secondary)	School-based	High school diplomas
	Special training & miscellaneous schools (upper secondary & postsecondary)	School-based	National skill certification (mainly industrial) or institution certificates of completion
	Technical colleges (upper secondary & postsecondary)	School-based	Institution certificates of completion or postsecondary degree
	Junior colleges	School-based	(as above)
United Kingdom (England & Wales)	Youth training (YT) (upper secondary)	Firm-based	National industry and guild qualifications
	Tertiary colleges, technical colleges, and colleges of further education (upper secondary)	School-based	National vocational qualification (NVQs)
United States	Comprehensive and vocational high schools and area vocational centers (upper secondary)	School-based	High school diplomas
	4-year degree-granting institutions (postsecondary)	School-based	Associate degrees or vocational certificates
	2- to 3-year degree-granting institutions (generally community colleges) (postsecondary)	School-based	(as above)
	Non-degree-granting institutions (generally vocational–technical institutes and proprietary schools) (postsecondary)	School-based	Vocational licenses or certificates

*There are small long-standing apprenticeship programs in Canada, France, and the United States. These programs are not included because they are not administered by the Department or Ministry of Education.

Chapter 3

Cross-National Comparisons of Data on Vocational Education and Training

This chapter begins by discussing some of the issues associated with collecting data on vocational education in the international forum and making cross-national comparisons. The next section identifies three types of indicators that are especially appropriate to cross-national analysis, and then describes the data that are available on these indicators. The chapter concludes with a discussion of ways to enhance cross-national vocational education comparisons.

Factors Constraining Cross-National Comparisons

Governments collect data about the scope and effectiveness of vocational education programs in order to meet requirements for information, based on national goals and objectives. As a result, data from national government sources are generally not tailored to the needs of the international forum. Accordingly, this section notes several issues that must be considered when making international comparisons of data on vocational education.

As described in the preceding chapter, countries take very different approaches to vocational education. These approaches reflect individual cultures and philosophies of education, which in turn yield varied vocational education and training strategies. The data governments collect, what they report, and how they report these data differ from country to country. These factors have implications for cross-national comparisons. Two issues are particularly confounding.

1. Since definitions as to what constitutes vocational education vary cross-nationally, it is often difficult to find common, comparable elements across systems.

Countries differ considerably in the types of programs they define as constituting vocational education or technical training. The European Centre for the Development of Vocational Training devotes an entire publication to defining and comparing terminology associated with vocational training in nine countries (CEDEFOP 1987). Important differences undermine comparability from system to system. For instance, apprenticeship programs are viewed as education functions in some countries and as manpower training in others. In Germany, for example, the "Dual System," which has both apprenticeship and in-school training dimensions, is administered by the Education Ministry. In England and Wales, Youth Training (YT), an apprenticeship-like program that does not have an in-school component, is administered by the Employment Department, rather than the Department of Education and Science. A similar problem occurs with data from almost every country including the United States. Further, even if enrollments could be counted in a comparable fashion, the data would not provide a comparable measure. While Germany, England and Wales, and the United States, have apprenticeship programs, the nature of each initiative is substantially different. As Keith Drake, Director of Continuing Education and Training, University of Manchester, England, noted:

> It is tempting to tabulate data on apprentices across [systems]. However, the same word—"apprentice"—is used for very different activities and attainments from country to country. . . . Training statisticians are still

> struggling to produce usable comparative training data . . . without writing for each country in each table a short explanatory essay on the nature of the training (Drake 1991, 212).

As subsequent sections of this chapter will show, countries "count" vocational students in different ways. This is a function of the structure of the vocational system—whether programs are based "in" or "out" of school, whether certain kinds of youth or employment training activities fall under the jurisdiction of education or labor ministries, and so forth. Because not all vocational education programs are provided by education authorities, when examining cross-national data, considerable effort must be devoted to describing who is being counted and how and why one country's way of counting vocational enrollments, or program completers, is similar to or different from another.

2. *While some vocational education programs may appear to be similar, this may mask differences that diminish the utility of some cross-national comparisons.*

Constructing comparable data describing vocational education is difficult because different types of training take place at different age–grade levels across systems. Hence, while program offerings may appear to be similar, the content of coursework may be very different. For example, what is expected in a vocational program at the upper secondary level in one country may be considered postsecondary training in another country. What students are expected to learn and the kinds of employment that they are being prepared for may be completely different.

Achieving relatively comparable cross-national data requires careful management of data and data sources. Realistic expectations are essential, and it is important to focus on those comparisons that are of greatest value, recognizing that only certain types of comparisons are appropriate in the international forum.

Three Key Indicators for International Vocational Education Comparisons

Education indicators are more than statistics. They are policy-relevant measures of the purpose, processes, and outcomes of education systems. Given constraints that so fundamentally distinguish the nature of vocational education and training across systems, three types of indicators are proposed here as appropriate for cross-national vocational education comparisons—*participation rates, vocational student supply and demand, and labor force outcomes for vocational participants and completers.*

Indicator 1: Vocational Education Participation Rates

The most basic type of data that offers important cross-national comparisons of the vocational education landscape concerns rates of participation. Data on the proportion of students at the secondary and postsecondary levels who are enrolled in and are completing vocational education and related training programs would suggest the relative emphasis that education systems place on technically preparing those students who are not pursuing traditional academic curricula for participation in the work force.

At first glance, counts of vocational education participants do not seem difficult to achieve. This is the case as long as each country's own definition of vocational education prevails. Thus, for example, it is possible to estimate the number of French students enrolled in school-based vocational programs. However, this count does not include those enrolled in a variety of other job-training programs that have schooling components, but that are not administered by the Education Ministry. In contrast, the German Education Ministry's counts of participation in vocational education include students involved in a variety of programs, some of which are not school based but that include a formal education component and are administered by the Education Ministry. Without careful qualification, one country may *appear* to have very high or low levels of vocational program participation compared with another country, when in fact the rates of participation are quite similar.

The United States has its own counting dilemma: at the secondary level, there is no specific definition of a vocational education student (Hoachlander 1994). In contrast, in most G-7 countries (as noted in chapter 2), students are enrolled in particular curricula—academic, general, or vocational. Since secondary schools in the United States do not formally categorize students in terms of a curriculum concentration, this raises the fundamental problem of determining a basis against which to compare participation rates in other vocational systems with participation rates in the United States. In fact, almost all students in the United States participate in the vocational curriculum at some point in secondary school, and a majority of students in less-than-4-year postsecondary institutions have taken vocational courses. (See Hoachlander et al. 1992 for a review of data and trends.) In order to make overall statistical comparisons of participation rates in vocational education in the United States with those of other countries, it is necessary to create an artificial construct—in other words, an American "definition" of a vocational education student—so that there will be a common framework. One might argue whether it is appropriate to designate students as "vocational concentrators" in the United States (since most schools do not). However, in order to make cross-national comparisons, some kind of construct is necessary.

As a data collection issue, there are several ways to address problems associated with different ways of defining participation from country to country. One alternative is to reduce data on participation to a common base. For example, in the case of the United States, one might be interested in knowing about participation in *school-based vocational education and training* because that is where most training occurs in the American system. With substantial effort it might be possible to identify those students in other countries who are in school-based programs. Once this is done, however, it must be understood that only a small portion of the population participating in training may have been described for countries that support substantial vocational training efforts that are not school based. A second alternative is to qualify the data on enrollments and participation from country to country so that the school-based commitments to vocational education and training are seen within the larger, or prevailing, context of each country. In this instance, the first step would be to describe total levels of participation in both school-based and nonschool-based programs, and then focus detailed analysis on just the school-based populations. A third alternative is to qualify the data by categorizing countries in terms of their vocational education and training foci; although the school-based vocational education and training framework may be highly appropriate for making comparisons among some countries, it may not be in others. This would involve grouping and comparing countries within these two categories, so that countries with mostly school-based training are analyzed as one group, while countries with training that is mostly not school based are analyzed separately.

These common sense ways of dealing with genuine differences in systems of education are often disregarded in an effort to create an illusion of commonality across countries. Under any circumstance, deriving cross-national participation rates in vocational education and training may raise as many questions as are answered. It is most important to know whether students participating in similar kinds of programs have been compared, or whether apparent differences in participation rates simply reflect variations in how systems of education and training are organized.

Indicator 2: Vocational Student Supply and Demand

A second indicator describes the vocational education and training priorities across countries, as they are reflected in the kinds of programs available, the extent of enrollment in different curricula, and the demand for workers in each field of study. This indicator would provide a perspective on how or whether countries encourage student enrollment in occupational clusters that are in demand, and how that demand differs from country to country. Generally, this indicator would offer a measure of the "pipeline," and also a way of understanding the fit between the pipeline and national labor markets.

Data on participation in different types of programs, as well as measures of labor force supply and demand by occupation, are difficult to place into a framework amenable to cross-national comparison. Courses of study differ from country to country across levels of schooling. In some countries, vocational education and training are targeted at the upper secondary level, while in others at the postsecondary level. There also tend to be considerable differences in the level of expertise expected as a result of program participation, with implications for the kinds of employment for which programs are attempting to prepare participants, which can easily be lost in cross-national analyses. France, for example, has programs that train young people for jobs in particular fields, but at different entry levels, requiring substantially different academic and vocational qualifications. These differences would be lost in simple cross-national comparisons.

Indicator 3: Labor Force Outcomes—What Happens to Program Participants?

A third cross-national comparison measures student outcomes—that is, the circumstances of vocational program participants in the labor force. These comparisons would include information concerning success rates in placing participants who *complete* different types of training in jobs, data on earnings of new workers, and information collected over time about the career paths of program participants and completers. These data would provide helpful indicators of both the success of programs (in terms of placements) and of workers (in terms of finding and keeping jobs as well as economic returns).

Comparisons of labor force outcomes represent ways of estimating the success of vocational education and training efforts, although appropriate data sources may be difficult to find and interpret. It may be particularly difficult to find data cross-nationally at specified points in time (for example, a certain number of months or years after program completion). Moreover, it may not be clear whether the payoffs of program completion are achieved at the same time from country to country. (For example, some programs may result in immediate benefits in earnings to completers, while others may have long-term benefits that occur over time.) Snapshots of earnings and employment outcomes cross-nationally, which are taken at specified points in time, may not account for these types of differences.

Status of Cross-National Comparisons for the Key Vocational Education Indicators

These three types of vocational education indicators have received relatively little attention at the cross-national level. As noted above, given the complexity of national vocational education and training systems and given differences across systems, these comparisons are difficult to achieve.

A few efforts have been made to report and compare vocational education data. At the international level, the Organization for Economic Cooperation and Development (OECD), the United Nations Educational, Scientific, and Cultural Organization (UNESCO), and the Statistical Office of the European Communities (EUROSTAT) are among the agencies publishing data on vocational education. In all cases, member governments provide the data. OECD, in particular, through the International Education Indicators (INES) project, has developed methodologies intended to reconcile differences in education data reporting systems among member governments. Generally, however, data on vocational education and training from international organizations do not grapple with the differences among systems, and the comparability questions are significant.

Tables 3.1 and 3.2 from the OECD represent the kinds of data that are available. Table 3.1 distributes upper secondary students across curricula. In effect, it documents the degree to which upper secondary students are participating in the vocational curriculum. No data were available from Canada, which collects most data at the provincial rather than at the national level (and these data are not aggregated); or from the United States, which as discussed earlier does not categorize and define upper secondary students in terms of their curricular concentration. Table 3.2, which characterizes only full-time upper secondary students, was derived from unpublished materials and provides additional detail about the G-7 upper secondary vocational population. These two tables reflect efforts to compare systems, although each is constrained by differences in definitions among curricular concentrations (countries may not define the same subject matter or activities as vocational); by differences in the organization of schools from system to system (neither the age of students at particular grade levels nor upper secondary grade configurations can be standardized across countries); and by differences in how data on student concentrations are derived.

Table 3.1—Selected enrollment and graduation characteristics at upper secondary and postsecondary levels in educational systems in G-7 countries: 1988

Country	Number of upper secondary full-time enrollees per 100 individuals in age group[1,2]									Number graduating secondary per 100 in age group[3]	Number enrolling in postsecondary per 100 in age group[4]
	All upper secondary			General			Voc–tech education and apprenticeship				
	Total	Male	Female	Total	Male	Female	Total	Male	Female		
Canada[5]	97.8	96.6	99.1	—	—	—	—	—	—	67.9	—
France[5]	84.9	82.8	87.1	37.1	30.6	43.8	47.8	52.2	43.3	84.5	36.4
Germany (West)[6]	118.1	123.5	112.5	24.0	23.6	24.5	94.1	99.9	88.0	112.1	28.7
Italy[7]	60.2	59.2	61.3	19.1	14.0	24.3	41.2	45.3	36.9	43.2	28.3
Japan[5]	94.0	92.4	95.7	67.5	64.9	70.1	26.6	27.3	25.8	89.5	51.4
United Kingdom[8]	76.9	74.7	79.2	63.0	62.2	63.9	13.5	12.1	15.0	65.1	21.2
United States[5]	90.2	88.0	92.6	—	—	—	—	—	—	73.7	69.5

—Not available.

[1]Upper secondary age group varies from country to country; it may begin at age 14, 15, or 16, and the duration may be 3, 4, or 5 years.

[2]May overestimate percentage of population in age range enrolled, since some students may be older or younger than the secondary age range.

[3]Includes 17- or 18-year-olds. In the case of Germany, many graduates are older than 18, the reference age.

[4]University or nonuniversity 18- or 19-year-olds.

[5]Upper secondary theoretical starting age is 15; duration is 3 years.

[6]Upper secondary theoretical starting age is 16; duration is 3 years. Some students are outside the normal enrollment age range: including, in particular, older students who previously completed a general secondary program and returned to enroll in a vocational program. The result overestimates the size of the upper secondary population relative to the size of the normal age range for upper secondary enrollment.

[7]Upper secondary theoretical starting age is 14; duration is 5 years.

[8]Upper secondary theoretical starting age is 14; duration is 4 years.

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation, *Education at a Glance* (Paris: OECD, 1992), 75, 77, 97.

Table 3.2—Percentage distribution of full-time upper secondary students in G-7 countries, by type of curriculum: 1991

Country	Percent enrolled in	
	General	Vocational/Apprenticeship
Canada	100.0	0
France	46.0	54.0
Germany (West)	20.7	79.3
Italy	29.4	70.6
Japan[1]	72.1	27.9
United Kingdom	79.7	20.3
United States	—	—
Definition A[2]	—	28.0
Definition B[3]	—	20.0
Definition C[4]	—	6.8

—Not available.

[1]Students enrolled in courses offered by Special Training Colleges (about 100,000 upper secondary students) are not included.

[2]Includes 1990 public high school graduates (not enrolled students), and shows the percentage of 1990 public high school graduates who completed 4.00 or more Carnegie units in specific labor market preparation courses.

[3]Includes 1990 public high school graduates (not enrolled students), and shows the percentage of 1990 public high school graduates who took 20 percent or more of all credits in specific labor market preparation courses.

[4]Includes 1990 public high school graduates (not enrolled students), and shows the percentage of 1990 public high school graduates who took 30 percent or more of all credits in specific labor market preparation courses.

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation, *Education at a Glance* (Paris: OECD, 1993), 119; U.S. data from unpublished 1990 NAEP Transcript Study.

Outside the framework of international organizations, academic researchers have made only modest efforts to look at the three types of indicators discussed in this report, usually comparing data from a few countries at most. Typical of these country-to-country comparisons is the work of the National Institute of Economic and Social Research in London, which published a series of studies on productivity, education, and training, comparing schooling standards in Great Britain with Japan and Germany (National Institute of Economic and Social Research 1990); and a study of training policy in the United Kingdom and the United States (Raffe and Rumberger 1992). These comparative studies, however, tend to f us on policy, steering clear of data comparisons and thereby avoiding the various dilemmas noted above. Research by Tan and his colleagues (1991) and Buechtemann and others (1993), described below in the discussion of the outcomes indicator, are representative of the relatively few attempts at a data-based comparison.

The complexity of vocational education systems has constrained the nature of cross-national comparisons. Among the indicators described in this report, international organizations have provided some very basic data on participation rates. With the exception of a few studies of vocational education outcomes in selected countries, little else is available across the G-7.

Data Available on the Key Indicators

National and international sources provide somewhat different perspectives on each of these indicators. Data from government ministries, which are reported in chapter 2, are a starting point for cross-national comparisons; however, they are driven by national definitions of vocational education and training, and they do not attempt to address problems of cross-national comparability. In contrast, some international sources, which are cited here, attempt to reconcile differences in definitions and provide a "common" analytical shell. As noted in the preceding chapters, however, vocational programs from country to country have more differences than similarities across the G-7, and "commonality" at the international level is difficult to achieve. Hence, this section will necessarily use both national government ministry data and data from international sources. Differences in the nature and quality of data on each indicator across sources will be noted.

Indicator 1: Data on Vocational Education Program Participation

Within the limits of national definitions, all G-7 countries produce data on vocational sector participation at the upper secondary and postsecondary levels. The amount of information available and its utility in cross-national analysis vary from country to country. In Germany, for instance, where the Education Ministry plays a significant role in vocational training, data about program participation are readily available. In Italy, on the other hand, where the vocational system is relatively decentralized, data on participation are modest, and little is collected by the national government. Similarly, in Canada, which is highly decentralized at the provincial level, national aggregations are difficult to find. Taken on their own terms, however, national counts of program participation are more likely to be available than other types of data on vocational education.

Across the G-7 countries, vocational education and training occur largely at the upper secondary or postsecondary level. Table 3.1 describes participation in and graduation from upper secondary and postsecondary education. The table does not include data for the United States because students are not formally categorized as vocational students and there is no generally accepted definition of a vocational student. In interpreting this table, it is important to understand that the duration of upper secondary education and the age range of students enrolled at this level vary from country to country. Further, table 3.1 may overestimate enrollments by type of curriculum because some students actually enroll twice—first undertaking coursework in a general curriculum, and second, after completing the general curriculum, in a vocational program. For example, in Germany, enrollments seem to exceed 100 percent of the age group theoretically eligible to attend at this level, because so many students outside the theoretical limits of the enrollment age have undertaken formal studies in more than one curriculum.

An important finding is worth noting: most countries fall into one of two groups—those that have large proportions of upper secondary-level students participating in vocational education programs (France, Germany, and Italy), and those that do not (Canada, Japan, the United Kingdom, and the United States). This finding is useful because it says something about national education policy at this level of schooling. In fact, it may seem somewhat surprising that these highly developed countries appear to have such different vocational education participation profiles.

Beyond these general predispositions, the data become confounded. Data reported for the United States refer to public school *graduates,* whereas the data from other countries refer to *enrolled* students. In contrast to table 3.2 table 3.3 estimates the proportion of students in other countries who *completed* upper secondary certificates in the general or vocational curriculum. Note that the general distributions are similar to those for enrollments; however, the table does not take into account persons outside the specified age groups who might complete programs at a later point.

Table 3.3—Number of public and private upper secondary graduates per 100 persons aged 17 in educational systems in G-7 countries: 1991

Country	Graduates from general programs	Graduates from vocational and technical education
Canada	72.5	0
France	30.8	45.0
Germany (West)[1]	24.2	93.1
Italy[2]	18.2	32.6
Japan[1]	66.4	24.7
United Kingdom	58.5	15.9
United States	—	—

—Not available.

[1]Data reflect the fact that many students take examinations in both curricula.

[2]18-year-olds.

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation, *Education at a Glance* (Paris: OECD, 1993), 176.

Data for the United States were especially difficult to derive because education is decentralized. Obtaining comparable data on the United States to produce national estimates requires using standardized national definitions—definitions that have proven difficult to implement in the past. As noted above, unlike many other countries, upper secondary schools in the United States do not formally categorize students as academic or vocational. For the purposes of this report, three definitions were developed for table 3.2. All of the definitions are based on the proportions of students graduating from high school who took certain numbers of credits or certain proportions of their coursework in *specific labor market preparation* in seven major vocational fields--agricultural and renewable resources, business, marketing, health, occupational home economics and services, trade and industry, and technical and communications. (See Gifford, Hoachlander, and Tuma 1989 for an extended discussion of the classification scheme.) The amounts of coursework students take in such classes offer one way of defining "vocational concentrators."

The three definitions in table 3.2 are as follows:

- *Definition A*: This is an estimate of the percentage of 1990 public high school graduates who completed 4.00 or more Carnegie units in specific labor market preparation courses. On average, 1990 high school graduates completed a total of 23.5 Carnegie units during their secondary school careers (U.S. Department of Education, Office of Educational Research and Improvement 1993, 90).

- *Definition B*: This is an estimate of the percentage of 1990 public high school graduates who took 20 percent or more of all credits in specific labor market preparation courses.

- *Definition C*: This is an estimate of the percentage of 1990 public high school graduates who took 30 percent or more of all credits in specific labor market preparation courses. It is the most restrictive definition.

As table 3.2 shows, these definitions result in quite different estimates. However, under all the definitions, it is apparent that secondary schools in the United States are oriented toward academic preparation, whether students are college bound or not, and that relatively few students concentrate in vocational education, compared with France, Germany, and Italy. This is confirmed in table 3.3, which shows the percentages of upper secondary graduates in each G-7 country completing general programs, compared with those earning vocational or technical diplomas.

Comparisons at the postsecondary level, as opposed to those at the upper secondary level, yield quite different conclusions. Table 3.4 provides a comparison of the fields of study of 18-year-olds entering postsecondary education. In this table, "nonuniversity" students refer to those who are studying curriculum that is technical or applied, rather than academic. The difficulty here is that not all countries distinguish university and nonuniversity curricula in the same way. For example, nursing, teaching, and engineering are considered university studies in some countries, but nonuniversity studies in others. Recognizing the problem associated with the ways in which fields of study are classified, these data must be interpreted with care. For example, the United States and Japan, which were both more likely to have upper secondary-level enrollments concentrated in the general or academic curriculum than were other countries (see tables in chapter 2), have high proportions of 18-year-olds entering the postsecondary applied curriculum. *This suggests that some countries might tend to defer vocational training to the postsecondary level, or give students an opportunity to undertake technical training at a later point in their school careers.* However, in the United States this might occur because of the large population of 18-year-olds participating in postsecondary education. The proportion of 18-year-old postsecondary students enrolled in "nonuniversities" in the United States seems typical for a G-7 country.

Table 3.4—Entering students in full-time public or private postsecondary education per 100 persons aged 18, by type of curriculum: 1991

Country	"Nonuniversity" postsecondary	University postsecondary	Nonuniversity as a percent of total postsecondary
Canada	—	—	—
France	15.3	29.0	34.5
Germany (West)[1]	11.4	31.2	26.8
Italy[2]	—	35.8	—
Japan	28.8	24.3	54.2
United Kingdom	7.5	20.2	27.1
United States	26.5	38.3	40.9

—Not available.

[1] 18- and 19-year-olds.

[2] 19-year-olds.

SOURCE: Organization for Economic Cooperation and Development, Center for Educational Research and Innovation, *Education at a Glance* (Paris: OECD, 1993), 126.

Tables 3.2, 3.3, and 3.4 represent much of the international effort to compile *relatively comparable cross-national comparisons* of student participation in and completion of school-based vocational education and training. In contrast, table 3.5 refers back to government ministry data reported in chapter 2. In this table, national definitions of what constitutes vocational education and training prevail. At the same time, the basic proposition is sustained: at the upper secondary level, G-7 countries can be characterized by "high" or "low" participation levels in the vocational upper secondary school-based curriculum.

Table 3.5—Rates of participation in vocational education and training in G-7 countries

COUNTRY	RATES OF PARTICIPATION BY SCHOOL LEVEL	RATES OF PARTICIPATION BY AGE IN SCHOOL	RATES OF PARTICIPATION BY AGE IN FIRM
Canada	68 percent of full-time community college students were enrolled in a long-term (career–technical) vocational program (1990–91). No secondary-level data were available.	6 percent of 18-year-olds, 10 percent of 19-year-olds, and 10 percent of 20-year-olds were enrolled full time in a long-term vocational program at a community college (1990–91).	
France	30 percent of upper secondary students (grades 10–13) were enrolled in a vocational–technical program. Of these students, 69 percent were enrolled in a program leading to an occupational certificate (BEP) (1990).		3 percent of 16- through 24-year-olds were registered as apprentices (1986).
Germany (West)	74 percent of upper secondary students (grades 10–13) were enrolled in vocational education. Of these students, 64 percent were enrolled in part-time vocational schools (most of whom participated in the dual system) (1991).	23 percent of 16- through 18-year-olds were enrolled in full-time vocational schools; 3 percent were enrolled in part-time vocational schools only (1986).	57 percent of 16- through 18-year-olds participated in the dual system (1986).
Italy	47 percent of upper secondary students (grades 9–13) were enrolled in technical education; 19 percent were enrolled in vocational education (1989–90).		
Japan	25 percent of upper secondary students (grades 10–12) specialized in occupational areas (1989).		
United Kingdom (England & Wales)	66 percent of further education students (grades 12–13) were enrolled in a program leading to a vocational qualification (1989–90).	10 percent of 16- through 18-year-olds were preparing for a vocational qualification or further education (1989–90).	23 percent of 16-year-olds and 21 percent of 17-year-olds participated in the government-sponsored Youth Training Scheme.
United States	20 percent of public high school graduates took 20 percent or more of all their credits in specific labor market preparation courses; 6.8 percent took 30 percent or more of all credits in specific labor market preparation courses (1990).		

Indicator 2: Data on Vocational Student Supply and Demand

Data on vocational enrollments by curricula and on demand for students by area of specialization are sparse. It would be reasonable to expect that education authorities make some effort to attract students into occupational clusters that are in demand or that are highly valued in terms of perceived future opportunities. To determine whether or to what degree this is the case, it would be necessary to track the supply of and demand for students completing programs in each occupational cluster. Data in this area, as summarized in table 3.6, are fragmented and incomplete. Germany tracks the demand for young workers because apprenticeship opportunities and new training contracts are closely linked to current and emerging business needs. For example, German data on the supply of and demand for training places, the number of unplaced training applicants, and vacant training places are reported annually. In addition, data are also used to follow trends in enrollments by subject area over time. This provides some clues regarding the types of jobs *students* think will lead to employment (to the extent that students enroll in vocational programs because they believe their labor force prospects will be enhanced).

Other countries, notably Japan, also track vocational (nonacademic) students at secondary and postsecondary levels by type of curriculum specialization. Again, this provides an over-time perspective on the kinds of occupations in which *students* believe there will be opportunities. These data, however, do not seem to be linked to any system monitoring the demand for graduates across occupational clusters.

In the United States, data from both the National Education Longitudinal Study (NELS) and the National Assessment of Educational Progress (NAEP) provide an indication of course-taking patterns among public high school graduates engaged in vocational education studies. At the postsecondary level, elements of the National Postsecondary Student Aid Study (NPSAS) provide cross-sectional information on participation in vocational curricula.

Generally, at the postsecondary but not the upper secondary level, most G-7 countries publish data on degree and certificate recipients by type of curriculum. This, however, does not capture the supply–demand perspective of the labor force that seems important to most vocational education and training program strategies.

Even the available data are difficult to interpret. While course specialization clusters from country to country may appear to be nominally related (for example, health occupations and agriculture), it is impossible to ascertain whether similar skills are taught, or similar employment outcomes are anticipated for students completing a particular curriculum cluster. In G-7 countries, the vocational education student pipeline and labor force demand by curriculum cluster are difficult to determine.

Table 3.6—Student vocational education concentration by type of program, and related occupational demand in G-7 countries

Canada	No information available.
France	No information available.
Germany (West)	In 1991, 51 percent of apprentices were specializing in business, 32 percent in crafts, 10 percent in medical or legal paraprofessions, 4 percent in government service, and 3 percent were classified as other. Top occupations for which apprentices were preparing included retail sales, auto mechanics, and various clerical (Federal Ministry of Education and Science 1992a). Data were not available at the secondary or postsecondary level on the percentages of students completing studies who found employment in their area of occupational specialization. No data were available on the demand for or placement rates of completers by occupation.
Italy	No information available.
Japan	In 1990, among upper secondary students specializing in vocational subjects, 11 percent were studying agricultural-related subjects, 33 percent industry-related subjects, 40 percent business, 9 percent home economics, 2 percent nursing, and 5 percent other subjects (Ministry of Education, Science and Culture 1990b). Data were not available at the secondary or postsecondary level on the percentages of students completing studies who found employment in their area of occupational specialization. No data were available on the demand for or placement rates of completers by occupation.
United Kingdom (England & Wales)	No information available.
United States	In 1990, among public high school graduates who completed three or more credits in one specific labor market preparation area, 32 percent took three or more credits in business courses; 22 percent in precision production (drafting, etc.); 9 percent in occupational home economics; 6 percent in marketing; 8 percent in mechanics; 3 percent in communications technology; 3 percent in health; and 10 percent in agriculture (does not sum to 100 percent, and some graduates may have taken three or more credits in more than one vocational subject area) (U.S. Department of Education 1992). In 1990, among nonbaccalaureate students enrolled in vocational majors in 2-year public institutions, 37 percent were studying business, 24 percent health-related fields, 11 percent engineering technologies, 10 percent trade and industry, 6 percent protective services, 7 percent computers and data processing, and 5 percent other (U.S. Department of Education 1990). Data were not available at the secondary or postsecondary level on the percentages of students completing studies who found employment in their area of occupational specialization. No data were available on the demand for or placement rates of completers by occupation.

Indicator 3: Labor Force Outcomes

Data on labor force outcomes among participants and completers of vocational education and training programs come exclusively from the national level; no data have been published by international agencies. As part of general household surveys, most G-7 countries collect some data about educational attainment and schooling history, employment status and history, and earnings. In most instances, this is done periodically, as with the Current Population Survey Education Supplement and the Survey of Income and Program Participation in the United States. However, data specifically linking employment and earnings to participation in or completion of vocational programs are not often available. Appendix A describes some of the major surveys in G-7 countries that include information about employment status, income, and education. Describing studies of labor force outcomes among participants in vocational education and training programs would require considerable country-by-country analysis. There are a few cross-national studies of the outcomes of program participation and the returns to vocational students. Tan (1991), for example, attempted to use data from surveys in Australia, the United States, and Great Britain to calculate and compare returns across countries. The complexity of these outcome phenomena, however, has discouraged country-to-country comparisons.

Table 3.7 summarizes several studies that focus on labor force outcomes among vocational students. While different things are measured from study to study, there is clearly interest at the national level in describing employment outcomes for students after they complete their studies. Generally, the studies reported in table 3.7 reflect real concern about the problems that students may face in finding employment in the short run after completing their education, as well as the capacity of the labor market to absorb new workers in the fields for which they are trained. As demonstrated in the table, not all countries are equally successful. In some countries for which data are available, vocational students find immediate placements after completing coursework and achieve certification at higher rates than in other countries (although this says nothing about long-term success in the labor market). It is important to understand, however, that these are not all general population studies, and that some of the data are focused on particular populations or cohorts, such as the data from the United States and the United Kingdom.

Without doubt, however, labor force outcomes are a matter of great concern across the G-7. While this has not resulted in a significant cross-national dialogue, many government-sponsored surveys are conducted according to strict data collection standards, which might be examined. Further, there might also be grounds for enhancing some of these surveys with questions and analyses that are of interest cross-nationally so that direct comparisons of populations across countries could be made in the future.

Table 3.7—Labor force outcomes for participants in vocational education and training in G-7 countries

Canada	Of those who received a Certificate of Apprenticeship in 1986 or 1987, 96 percent obtained a job in their trade area during the first year after the program; 90 percent held jobs in their trade area 2 and 3 years after the program. In addition, 85 percent of those with jobs in their trade area were employed at the journeyman level (Employment and Immigration Canada and Statistics Canada 1990). The average annual earnings of 1986 trade–vocational (short-term program) graduates 2 years after graduation was $18,000 in Canadian currency; for career–technical (long-term program) graduates, their earnings were $21,000 in Canadian currency (Employment and Immigration Canada and Statistics Canada 1990).
France	In 1984, 57 percent of women and 45 percent of men with vocational or occupational certificates were unemployed 9 months after leaving school (CEDEFOP 1989).
Germany (West)	Six months after completing apprenticeship training, 52 percent of completers were employed in their trained occupation; 15 percent were employed in another field; 10 percent had entered the military and alternative national services; 13 percent had continued on to further education or other training; and 10 percent were unemployed (Federal Ministry of Education and Science 1992d).
Italy	No information available.
Japan	In 1989, 87 percent of technical school *(koto senmon gakko)* graduates were employed 2 months after they graduated; 2 percent were unemployed (Ministry of Education, Science and Culture 1990b).
United Kingdom (England & Wales)	Among a 1987 representative sample of 16-year-olds in England and Wales participating in a Youth Training Scheme (YTS), 1 year later 57 percent were still participating in YTS; 34 percent were working full time; and 6 percent were unemployed (Courtenay and McAleese 1991).
United States	Of 1982 public high school graduates who were not enrolled in postsecondary education and who accumulated 8.00 or more Carnegie units in vocational education in high school, 50 percent were employed full time 6 months after graduation. Thirty-four percent of graduates with less than 2.00 Carnegie units were employed (Hoachlander et al. 1992). The average hourly wage of 1982 public high school graduates working full time (and not enrolled in postsecondary education) 6 months after graduation ranged between $4.07 to $4.23, with no significant difference by the number of Carnegie units accumulated in vocational education (Hoachlander et al. 1992).

Enhancing Data Collection and Improving the Quality and Availability of Comparable Cross-National Data on Key Vocational Education and Training Indicators

There is a paucity of comparable cross-national data on vocational education and training programs in G-7 countries and little, if any, data on special populations, such as students with disabilities and limited English proficiency. As American policymakers and school practitioners continue to evaluate ways of producing a skilled labor force prepared for the challenges of the 21st century, there is a pressing need for more information about vocational education and training programs in other countries and a real interest in understanding how well other "models" of training and preparation have worked. One important aspect of such inquiry involves comparisons of vocational education and training programs among our chief economic competitors. This concluding section discusses possible approaches to enhancing the level of information on each of the three indicators described in this chapter.

Indicator 1: Vocational Education Program Participation

Data on vocational education participation rates are essential and amenable to analysis by international organizations. The INES project of OECD represents an example of a forum for enhancing data and data comparability of this type.

An improved indicator of vocational participation requires achieving agreement on which programs in each country are to be considered part of the vocational education system (among European nations, work in this area has been done by the European Centre for the Development of Vocational Training); distinguishing data on vocational–technical schooling from data on apprenticeships; and differentiating data on student enrollments from data on program completers in each program. To produce more detail on a participation indicator, sources of information within each G-7 country could be used (see Appendix A), recognizing that this would leave some issues of comparability unresolved. For instance, general household surveys in Canada (General Social Survey), Germany (Microzensus), and the United Kingdom (General Household Survey) are data sets that are somewhat similar to the Current Population Survey in the United States. Each collect some information on the educational history of individuals 15 years and older. Analysts could examine specific items pertaining to vocational education participation and program completion and could encourage cooperative exchange of such information among governments.

Indicator 2: Vocational Student Supply and Demand

Of the three types of indicators, supply and demand issues have received the least attention in the international forum. Nonetheless, this type of indicator is significant because it provides a particularly helpful way of understanding how responsive the vocational education system is to labor force needs and opportunities. To date, these kinds of data have not been collected in a cross-national setting, and little data could be found from national sources. For many reasons—e.g., differences in how occupations are grouped from vocational education system to system, and differences in the level and type of work for which credentials in different countries prepare students—cross-national comparability would be very difficult to achieve.

Even so, a cooperative research effort among a few countries might define how such data could be organized. This would provide a way of describing the vocational education "pipeline" from country to country, as well as the fit between student preparation and the needs of the labor force.

Indicator 3: Labor Market Outcomes

Given the differences in vocational systems across the G-7, there is no common metric against which to compare labor market outcomes of students completing programs. To achieve a comparable measure, it would be necessary to attempt some sort of "crosswalk" that would define which programs are generally alike from country to country, both in terms of objectives and the skills students are expected to have acquired upon program completion. On this basis, the employment and wage outcomes (adjusted for parity) of program completers could be compared, to the extent that such data are collected at the national level. A small-scale project, through an institution such as OECD, would represent an appropriate venue for developing the indicator. Such an effort would be especially useful because it would provide a perspective on the degree to which those completing particular kinds of vocational credentials are able to find a productive place in the labor force.

Conclusion

Because of the complexity of the vocational systems in G-7 countries, the development of any indicator such as the ones described in this report would require 1) substantial development efforts by international organizations and, in some cases, a financial commitment on the part of participating nations to collect data; and 2) careful reflection about the utility of a given indicator. While international organizations rely on national government ministries to provide data, they are well situated to synthesize and report data across countries with very different education systems. Further, given the differences in the systems that have been described here, international organizations represent the best forum in which to capture comprehensive portraits of the larger school-to-work transition environment and how it differs from country to country.

Each of the three indicators described in this report would require a significant development effort by an international organization. For instance, the indicator on student supply and demand would require a substantial financial commitment on the part of participating countries to collect additional data. All G-7 countries have information that could inform these indicators (see Appendix A). However, these sources have not necessarily been applied in a cross-national framework. As a result, to elaborate the indicators, cooperation at both national and international levels would be necessary. Data-related requirements for each indicator are most appropriately defined with international agreement, and data sets must be compared country by country to determine commonalities and differences in terms of what is collected and available. To the extent that national sources could provide some or all of the necessary data in a relatively comparable fashion, the indicators could be elaborated, even though this might require a substantial commitment. From the evidence compiled in this report, data on participation and measures of student outcomes could be derived from existing data collections in most G-7 countries. In contrast, data on vocational education student supply and demand have received only modest attention, and in only a few G-7 countries. A considerable data collection commitment at the national level in each country would be required to support the development of this indicator.

The utility of indicators on international vocational education needs to be carefully scrutinized since, as this report has carefully detailed, the systems of vocational education differ considerably across the G-7 countries. Of the three indicators described, the participation indicator is perhaps the most amenable to cross-national analysis, and a reasonable degree of data comparability might be achieved. In addition, the participation indicator reflects the degree to which vocational education is used as a training vehicle in G-7 countries.

Appendix A

Sources of Information on Vocational Education and Training: Panel and Cross-Sectional Studies in G-7 Countries

CANADA

Cross-Sectional Surveys

General Social Survey. This household survey contains an education and work questionnaire. Respondents represent random samples of household members 15 years or older. In 1988, approximately 10,000 individuals were surveyed from the 10 provinces. Topics covered include educational attainment and future educational goals, employment experience and status, and knowledge of science and technology.

CONTACT: Statistics Canada
Housing, Family and Social Statistics Division
RH Coats Building
Tunney's Pasture
Ottawa K1A 0T6

Labor Force Survey. This survey, conducted since November 1945, collects data every month on the labor force (the population 15 years or older). Statistics Canada surveys a representative sample of about 62,000 households and approximately 115,000 people (over the age of 15) in Canada (excluding the Yukon and Northwest Territories). Selected households remain as part of the sample for 6 months.

This survey provides monthly estimates of participation in the labor force, estimated for the week containing the 15th of the month. Other data that are collected include information on educational attainment (highest grade completed and highest degree or certificate received), and the occupation and industry attachment of all household members 15 years or older.

CONTACT: Statistics Canada
Household Surveys Division
RH Coats Building
Tunney's Pasture
Ottawa K1A 0T6

National Graduates Survey. This study surveys graduates of trade/vocational programs, colleges, and universities 2 years after graduation. Statistics Canada conducted three rounds of this survey, most recently in 1988 (Class of 1986). Other years that were surveyed included 1984 (Class of 1982) and 1978 (Class of 1976). Approximately 40,000 graduates who remained in Canada after graduation were interviewed by telephone.

Data concentrate on school-to-work transition and include information on graduates' earnings and income, employment status (including the relationship of jobs to education), and attitudes toward their education.

CONTACT: Statistics Canada
Education Culture and Tourism Division
RH Coats Building
Tunney's Pasture
Ottawa K1A 0T6

National Apprenticeship Survey. In 1989, Statistics Canada conducted telephone interviews of 9,100 participants in registered apprenticeship programs in Canada (except for the province of Quebec) who either completed or left the program during 1986 or 1987.[131]

The purpose of the survey was to provide information similar to that collected on the National Graduates Survey, but for those registered in apprenticeship programs.

Among other things, respondents were asked about attitudes before beginning the apprenticeship; required hours of work in the apprenticeship program in-class training; certification; work in trade; employer questions; labor force experience since the apprenticeship; work outside the trade; and additional training and courses.

CONTACT: Statistics Canada
Education Culture and Tourism Division
RH Coats Building
Tunney's Pasture
Ottawa K1A 0T6

FRANCE

Cross-Sectional Surveys

Survey of School Leavers. In March of each year, the Institut National de la Statistique et des Études Économiques (INSEE) conducts a sample survey of school leavers (1 in 300). The survey is intended to estimate who leaves school at each secondary and postsecondary level. The data are used to describe the situation of students who have left the educational system the preceding spring. The data also examine employment status, participation in apprenticeship programs and national service, and types of qualifications attained by school leavers.

CONTACT: L'Institut National de la Statistique et des Études Économiques (INSEE)
18 Blvd. Adolphe Pinard
75014 Paris

Telephone: (33) 1 41 17 50 50
Telefax: (33) 1 41 17 66 66

Survey of Secondary School Leavers and Their Progression into the Professions (L'Enquête Annuelle d'Insertion Professionalle des Sortants de l'Enseignement Secondaire). Conducted 6 months after the end of each school year, this survey examines access to the job market among school leavers. Surveys are conducted by written questionnaire or by interview, and one schooling level is surveyed each year in a cycle (those leaving school with qualifications above the baccalaureate level, those leaving with qualifications at the baccalaureate level, and those leaving with qualifications, or without diplomas, below the baccalaureate level).

[131]Survey results do not reflect those apprentices still in the program during the 2-year span.

CONTACT: Ce tre D'Études et de Recherches sur les Qualification (CEREQ)
10, Place de la Joliette
B.P. 176
13474 Marseille

Telephone: (33) 1 91 13 28 28
Telefax: (33) 1 91 13 28 80

GERMANY

Cross-Sectional Surveys

Microzensus. The German Statistics Bureau (Statistisches Bundesamt) conducts this annual census of the population and the labor force. Detailed data on employment are collected by occupational title every 2 years; currently, there are approximately 25,000 recognized occupational titles. Data items include net income; school completion by level (i.e., secondary and higher); and type of school (i.e., general or vocational/occupational). Postunification data will not be available until 1995.

CONTACT: German Statistics Bureau
(Statistisches Bundesamt)
Postfach 55 28
6200 Weisbaden 1

Telephone: (49) 06 11 71 1
Telefax: (49) 06 11 72 40 00

Basic and Structural Data. This is an annual survey conducted by the Federal Ministry of Education and Science. It contains data on school participation by level and type of school.

CONTACT: Federal Ministry of Education and Science
(Bundesminister für Bidung und Wissenschaft)
Heinemannstaße 2
5300 Bonn 2

Telephone: (49) 02 28 57 23 72

ITALY

No specific data sources have been identified. ISTAT, the federal government statistics bureau, collects data on school enrollments. The Ministry of Employment and the Ministry of Education also have some data on participation in regional vocational training, professional education, and apprenticeships.

CONTACT: ISTAT
Via Cesare Balbo, 16
1-00100 Rome

Telefax: (39) 6 854 7321

JAPAN

Cross-Sectional Surveys

Basic School Survey. Public schools on all levels (i.e., national, prefectural, etc.) and private and cooperative schools are required each year to provide basic school information to the Ministry of Science, Education and Culture. This Basic School Survey is conducted on May 1st of each year. Schools provide information as of May 1st on the previous year's enrollees and graduates, teachers and staff, facilities and finances. Information is generally provided on a classroom or school level; no information is collected on individual students. At the school level, however, the information collected includes: 1) number of students by grade, gender, and type of program (academic, agricultural, industrial, business, etc.); 2) for upper secondary schools, the number of students who were admitted to the school and the number who entered; and 3) for graduates, the status of the graduate as of May 1st of that year.

CONTACT: Ministry of Education, Science, and Culture
Research and Statistic Planning Division
3-2-2 Kasumigaseki
Chiyoda-ku
Tokyo 100

Telephone: (81) 3 3583 1547
Telefax: (81) 3 3592 1065

Japanese High School and Beyond Survey. In 1980, the Japan Youth Research Institute conducted a survey similar to the High School and Beyond (HS&B) study. Only a small sample of schools (46) were involved, and only high school seniors participated. No cognitive tests were administered, as was the case in HS&B.

CONTACT: Ministry of Education, Science, and Culture
All Japan Youth Development Association
2-4-5 Iidabashi
Chiyoda-ku
Tokyo 102

Telephone: (81) 3 3263 7881
Telefax: (81) 3 3238 1753

UNITED KINGDOM (England and Wales)

Cross-Sectional Surveys

General Household Survey (GHS). The GHS is an annual survey of noninstitutionalized residents of Great Britain. The survey has been conducted by the Office of Population Censuses and Surveys (OPCS) since 1971. Similar to the U.S. Current Population Survey, OPCS interviews one household member (16 years or older) and gathers information about the entire household.

The GHS is used by the government as a source of data on the status of households and for over-time comparisons. This survey, together with the **Family Expenditure Survey** and the **Labor**

Force Survey, is an especially valued source of information between decennial population censuses.

The 1990 survey included interviews with 18,384 people aged 16 and over, from 9,623 households. The 1990 response rate was 83 percent. The main subject areas that the survey covers are population and fertility, housing, health, employment, and education. In addition, this survey includes questions relating to education level and qualification status, employment status, and participation in government training schemes (Youth Training, Employment Training, etc.).

The National Institute of Economic and Social Research (NIESR) in London used this data set, along with the *Microzensus* data set from Germany, to make cross-national comparisons of levels of vocational training.

CONTACT: Office of Population Censuses and Surveys (OPCS)
Social Survey Division
St. Catherine's House
10 Kingsway
London WC2B 6JP

Telephone: (44) 071 396 2200
Telefax: (44) 071 404 3020

Department of Employment Surveys. Several surveys conducted by the Department of Employment are concerned with specific employment programs.

Labour Force Survey. The purpose of this survey is to gather information on employment and unemployment trends and patterns. It is conducted every 3 years on a representative sample of approximately 40,000 households. Respondents self-report information on their employment status (including some questions on past training).

Youth Training Scheme Survey. This survey of all who enter the youth training program is conducted by the Training Agency of the Department of Employment (formerly the Manpower Service Commission). Data are self-reported, and do not differentiate between short- and long-term program participants.

CONTACT: Department of Employment
Moorfoot
Sheffield S1 4PQ

Telephone: (44) 074 259 3932

Other Surveys

Destination of School Leavers. The Department of Education and Science annually surveys all Local Education Agencies (LEAs) on their school-leaving population. Survey items are designed to identify postcompulsory schooling plans of students.

CONTACT: Department of Education and Science
Sanctuary Buildings
Great Smith Street
Westminister
London SW1 3BT

Oxford Mobility Survey. This one-time 1972 survey involved interviews with a representative sample of men aged 20–64 living in England and Wales. Respondents were questioned about a wide range of subjects, including their families, educational experiences, and job status.

Panel Surveys

Longitudinal Study (LS). The LS links event records (e.g., birth, cancer, immigration, and death records) with decennial census records (1971, 1981, and 1991) for 1 percent of the population of England and Wales (approximately 500,000 people). LS drew its initial sample from all people born on each of four dates each year, as recorded in the 1971 General Census. Records for these people and members of their household became the initial LS database. Since then, individuals have been added, including immigrants with those four birth dates and infants who were born on those dates in subsequent years. The LS was established for the purpose of collecting social statistics and, in particular, data on mortality.

CONTACT: Office of Population Censuses and Surveys (OPCS), Health Statistics
St. Catherine's House
10 Kingsway
London WC2B 6JP

Telephone: (44) 071 242 0262
Telefax: (44) 071 404 1186

National Survey of Health and Development (NSHD). The NSHD followed 5,362 children born in the first week of March 1946, until the age of 21. This cohort took a battery of school achievement tests at ages 8, 11, and 15. In addition, the survey included information on family background (family size, father's occupation, and educational level) and educational attainment (years of formal schooling).

CONTACT: For more information, see
J.W.B. Douglas, J.M. Ross, and H.R. Simpson
All Our Future: A Longitudinal Study of Secondary Education
London: Peter Davies, 1968

National Child Development Study. The National Children's Bureau of London conducted the Perinatal Mortality Survey of "virtually all" babies born in England, Scotland, and Wales during the first week in March of 1958. The National Child Development Study is made up of follow-up surveys of this cohort. Since 1958, there have been five follow-up surveys: conducted in 1965, 1969, 1974, 1981, and 1991.[132] The first three follow-up surveys involved interviews with a child's parent or guardian and the head teacher at the child's school. It also included a medical examination and various other test batteries. In addition, the third follow-up contained information gathered from the students on their aspirations and expectations. In the fourth follow-up, a detailed interview was conducted with cohort members that included questions regarding their involvement with postsecondary education and the labor force.

CONTACT: National Children's Bureau of London
8 Wakley Street
London EC1V 7QE

Telephone: (44) 071 278-9441

[132]Data has not been released yet on the fifth follow-up.

Cohort Study of TVEI Extension Students. This is a 4-year longitudinal survey (1990–94) of two cohorts of young people which starts at ages 14 and 15 and follows the teenagers until they are age 17. Conducted by the National Foundation for Educational Research in England and Wales, data are included on the following: students' characteristics and background; students' school experience (e.g., curriculum, accreditation, industry–education links, and career guidance); students' postschool destinations, education, training, and experience; students' acquisition of skills and knowledge in TVEI-related areas and their qualifications; equal opportunity issues; and students' attitudes toward TVEI-related experiences.

CONTACT: National Foundation for Educational Research in England and Wales
The Mere, Upton Park
Slough, Berkshire SL1 2DQ

Telephone: (44) 075 357 4123
Telefax: (44) 075 369 1632

Youth Cohort Study. This longitudinal study of 16- to 19-year-olds is co-sponsored by the Employment Department and the Department for Education. The study tracks a representative sample of approximately 20,000 16-year-olds in England and Wales for three years, collecting information on school experience, job and training experience (including wage information), and parental employment and education level. These young people are surveyed once a year on their activities in the preceding 12 months. The first cohort of 16-year-olds was surveyed in 1985. Since then five other cohorts were surveyed (in 1986, 1987, 1989, 1991, and 1992).The purpose of this study is to provide information on the school-to-work transition of young people, after they complete compulsory schooling at age 16.

CONTACT: Employment Department
Statistical Services Division
Moorfoot
Sheffield S1 4PQ

Telephone: (44) 074 259
Telefax: (44) 074 259 4371

UNITED STATES

Cross-Sectional Surveys

Education Supplement to the Current Population Survey. The Current Population Survey (CPS) is conducted by the Bureau of the Census on a regular basis. The monthly CPS primarily collects labor force data for the civilian non-institutionalized population. In addition to the basic CPS questions which are asked every month, in October of each year supplementary questions about school enrollment are asked of all eligible household members 3 years old and over. Questions asked every October include enrollment status in regular school (nursery, kindergarten, elementary, high school, college, university, or professional school), grade level, enrollment in school during the previous year, participation in vocational education, and high school graduation status of the individuals living in the sampled households.

The present CPS sample covers all 50 states and the District of Columbia. About 56,100 occupied housing units are eligible for interview every month. Since 1981, sample sizes have ranged from about 53,000 to 59,000 households.

CONTACT: U.S. Bureau of the Census
Population Division
Education and Social Stratification Branch
Washington, DC 20277

Longitudinal Surveys

Survey of Income and Program Participation. The Survey of Income and Program Participation (SIPP) expands the kind and amount of information available to analyze the economic condition of households and individuals. The SIPP panel sample consists of 55–60,000 persons selected to represent the non-institutionalized population of persons at least 15 years of age. Participants are interviewed once every four months for a 27 month period (8 interview waves). During each interview wave information is collected regarding labor force activity and income received during each four month period. During one of the interview waves, participants are asked about their education and work training history. For those who have received vocational training at the postsecondary level, data enable study of labor market success as it relates to education and area of training.

CONTACT: U.S. Bureau of the Census
Population Division
Washington, DC 20277

The U.S. National Center for Education Statistics (NCES) conducts a number of longitudinal surveys pertinent to issues of data collection on vocational education described in this report. For more information on the National Longitudinal Survey, High School and Beyond, the National Education Longitudinal Study, the High School Transcript Studies, and the Schools and Staffing Survey described below:

CONTACT: U.S. National Center for Education Statistics
555 New Jersey Av. NW
Washington, DC 20208

National Longitudinal Survey of 1972. The National Longitudinal Survey of 1972 (NLS–72) was the first longitudinal study conducted by NCES. The sample for the base year, NLS–72, included students from public and private schools in the 50 states and the District of Columbia who were enrolled in grade 12 during the 1971–72 school year. NLS–72 oversampled schools in low-income areas and schools with significant minority populations. The NLS–72 series of surveys involved 22,000 high school seniors. Data collected from student surveys include information about their personal and family background, education, and work experience. Students' high school curriculum track (academic, vocational, or general) and standardized test scores were collected from school records. NLS–72 students completed a battery of achievement–ability tests in vocabulary, reading, and mathematics and tests of reasoning and memory. Follow-up surveys were conducted in 1973, 1974, 1976, 1979, and 1986 and contain information about postsecondary education, work experiences, and family formation.

High School and Beyond Student Surveys. High School and Beyond (HS&B) is a longitudinal study of two cohorts: 1980 high school seniors and 1980 high school sophomores. The database contains information collected in a series of student questionnaires, scores from a battery of achievement tests, and information about the high schools attended by the students. High school transcripts were collected for the 1980 high school sophomore cohort, and postsecondary school transcripts were collected for both cohorts.

The HS&B 1980 senior cohort contains a nationally representative sample of 28,000 high school seniors in 1980 from 1,015 public and private high schools across the county. The sophomore cohort includes more than 30,000 sophomores enrolled in the same schools in 1980.

The study design provided for a nationally representative sample, oversampling schools with high-minority populations, alternative public schools, and private schools with high-achieving students. Surveys conducted in 1980 recorded information about the students' demographic characteristics, family backgrounds, and educational experience. Followups were conducted in 1982, 1984, and 1986, and 1992. These follow-up surveys contain information on postsecondary education, work experience, and family formation.

Some school information—including length of school year, availability of educational programs (such as remedial and gifted education), availability of student programs (academic, general, and specific vocational programs such as business education), courses offered, and use of minimum competency testing—has been collected for the HS&B sample of schools.

1982 High School Transcript Study. The 1982 High School Transcript Study contains complete transcripts for approximately 12,000 members of the 1980 HS&B sophomore cohort. Transcript information for the cohort was collected in 1982 from the 9th- through 12th-grade records (the school years 1978–79 through 1981–82). Because the transcript information is more complete and accurate than the student-reported information about courses and grades, transcript data are particularly useful for analyzing student course taking and grades.

For each course taken by a student in grades 9 through 12, the data files contain a course code, the school year and term that the course was taken, the credits attempted and earned, and the final grade. The course codes describe both the subject and level of the courses. Classification codes like those in other NCES secondary transcript studies are used so that courses taken by students from different transcript studies can be compared. Courses that are part of the special education curricula are identified. In addition, each student record contains information on the student's rank in class, overall grade-point average, number of days absent in each school year, number of suspensions, the date and reason the student left school, and scores for standardized tests.

For the HS&B sophomore cohort transcripts include information about all high school courses and grades for students, and student-reported information about courses and grades in selected subject areas; verbal and quantitative achievement, science, writing, and civics scores; and student characteristics such as sex, race–ethnicity, socioeconomic background, and high school curriculum track.

1987 and 1990 High School Transcript Studies. Three high school transcript studies have been conducted since 1980. The first was part of the High School and Beyond (HS&B) first followup survey in 1982. About 12,000 transcripts were collected from school records for HS&B sophomore cohort students who were seniors in 1982. A second study, the 1987 High School Transcript Study, surveyed approximately 22,700 seniors who had participated (as 11th graders) in the 1986 National Assessment of Educational Progress (NAEP).

The 1990 High School Transcript Study consisted of systematically transcribing about 23,000 transcript records to determine the course-taking patterns of 12th-grade high school students selected from the 1990 NAEP assessment sample. With this connection, test results can be linked to course-taking patterns. All transcript information was collected by field personnel; no personal contacts were made with students. The coded data were compatible with the data produced in the 1982 HS&B Transcript Study and the 1987 High School Transcript Study. To ensure maximum compatibility, the procedures and formats used in previous studies for editing, coding, error resolution, and documentation were also used for the 1990 transcript data. This consistency enables users to compare cohorts.

Among the data on student characteristics available from the 1990 transcript study are: dates when attended and left school; graduate or not when left school; high school programs in which enrolled; completion status of curricular programs (particularly vocational programs); days absent; honors awarded; disciplinary actions recorded; grade point average; standardized test scores; and student rank in relation to class size. Data on course-level characteristics include: subject matter of the course; period of time the course was taken; grade earned; credits earned; whether the course was taken at an Area Vocational Technical Center; and whether the course was designed for honors, exceptional, or special education students.

National Education Longitudinal Study of 1988. The National Education Longitudinal Study of 1988 (NELS:88) is a new database that follows students from the time they are enrolled in the eighth grade. The NELS:88 sample, drawn from the cohort of students enrolled in 8th grade in 1988, is representative at the national level. Participants were randomly selected from each of the 1,000 public and private schools sampled for the study. Some 25,000 8th graders and their parents, teachers, and school principals were surveyed in 1988. Hispanic and Asian-American students were oversampled to create a sufficiently large sample for analysis of language-minority students.

The first followup surveyed the same students in 1990, when most were in 10th grade; the second followup in 1992, when most were in their senior year of high school. The database contains student background information including race–ethnicity, sex, and socioeconomic status indicators and identifies handicapped students. Information on school policies and practices, testing and minimum course requirements, activities, and school climate are among the data available from a school administrator questionnaire.

Four cognitive tests were administered in 1988, 1990, and 1992. In 1990 and 1992, both students and school dropouts from the 8th-grade sample took cognitive tests in reading, science, social science (history and government), and mathematics. The tests were designed to reflect 8th- through 12th-grade coursework and have enough overlapping items with the 8th- and 12th-grade tests to permit measurement of academic growth.

High school transcripts for this sample of students have also been collected. These transcripts include courses taken, credits earned, and grades achieved in all high school classes. Information available includes: courses taken and grades achieved while in high school; achievement test scores in reading, science, social science, and mathematics (administered in 8th, 10th, and 12th grades); student characteristics including sex, race–ethnicity, and socioeconomic background; school policies, including testing and minimum course requirements for graduation (which can be linked to courses taken, grades, achievement test scores, and dropout rates); test scores from 8th to 12th grade for students with different course-taking patterns; and dropout rates for students with different course-taking patterns, grade-point averages, and achievement test scores, as well as data for students attending schools with different graduation requirements.

Schools and Staffing Survey. The Schools and Staffing Survey (SASS) is a comprehensive public and private school education database that combines and expands on three data sets previously collected by NCES: a survey of teacher demand and shortages, surveys of public and private schools, and a survey of public and private school teachers. In 1987–88, SASS contained a sample of approximately 65,000 teachers, 12,800 schools, and 5,600 school districts. The data from SASS support national estimates of various characteristics of public and private schools and state estimates for public schools. Data have been collected for 1987–88, 1990–91, and 1992-93. It will be administered at 2-year intervals in the future.

SASS contains four questionnaires. The *Teacher Demand and Shortage Questionnaire* surveys schools about demand for teachers and factors affecting the supply of teachers. It also asks about the number of credits students in the graduating classes must complete in order to graduate from school. The *School Questionnaire* surveys programs, policies, and conditions; student characteristics; and staffing patterns. The *School Administrator Questionnaire* surveys principals and school heads about their backgrounds and their perceptions of school climate. The *Teacher Questionnaire* provides information about the demographics and qualifications of teachers, their working conditions, career history, and career plans.

SASS files contain information that is useful for developing descriptions of school policies. These data can be used to track changes over time in school policies and graduation requirements, beginning with the 1987–88 school year, for the entire nation or for the public sector in individual states. Although SASS does not contain information about individual students attending these schools, it includes some appropriate data about students and data describing available curriculum and student programs.

National Assessment of Vocational Education. The Department of Education, Office of Research in the Office of Educational Research and Improvement recently conducted the National Assessment of Vocational Education (NAVE) programs mandated by Section 403 of the 1990 Perkins Act. This assessment evaluated the current status of vocational and occupational education, and addressed four major subject areas: the implementation and, where possible, effects of the 1990 Perkins Act, including the allocation of funds; participation of special populations in vocational education; the quality of vocational education programs; and vocational education and employment.

- Implementation: The 1990 Perkins Act is intended to promote major reforms in vocational education. Because of the limited time period covered by the assessment, it could not determine definitively whether these reforms have been successful. However, it did examine the processes of implementing provisions of the 1990 Perkins Act, gauge the progress of states and localities in achieving the goals of the legislation, and identify the effects of the Act insofar as they were observable by the spring of 1993. Examples of questions that address implementation of the 1990 Perkins Act included: 1) what steps were being taken to develop and implement performance standards; 2) what services were provided to special populations; and 3) what were states and localities doing to implement provisions of the Act.

- Participation of special populations: Participation of special populations in vocational education has been a continuing emphasis of federal policy, but the 1990 Perkins Act changed the approach by eliminating set-asides for some groups, such as students with disabilities and limited English proficiency. Examples of how the assessment studied the participation of special populations included comparing participation rates of special and general populations at both the secondary and postsecondary levels, and using longitudinal data to determine the employment outcomes of special education students who participated in vocational education.
- Program quality: The assessment addressed the quality of vocational education. Questions included: how well qualified were teachers of vocational education; what was the quality of course materials used; and what were the academic outcomes of vocational education.
- Employment outcomes: Employment is an important outcome of participation in vocational education. The assessment examined the school-to-work transition, employment outcomes of vocational students, the relevance of vocational training to subsequent occupations, and employer involvement in and satisfaction with vocational education.

A variety of methods were utilized in the study. The assessment conducted surveys and case studies, analyzed data from NCES, reviewed existing literature, and used studies conducted by research centers funded by the Department of Education.

- Surveys: Surveys were conducted of secondary and postsecondary schools, school districts, state directors of vocational education, teachers, education directors of juvenile correctional facilities, advisors to vocational student organizations, and employers. The surveys provided nationally representative data.
- Case studies: Community-based case studies on curricula were conducted at 20 sites across the country. Another set of case studies was conducted on tribal schools that received Perkins funds. A third set of case studies examined changes in schools that received much higher and much lower Perkins allocations in the 1991–92 school year than in the previous year.
- Analyses of NCES data: The Office of Research examined student participation, academic outcomes, and teacher qualifications using NCES data sets, such as the National Assessment of Educational Progress, the National Postsecondary Student Aid Study, and the Schools and Staffing Survey.
- Literature reviews: A series of literature reviews was conducted to address broad issues in vocational education, such as teacher training, contextual learning, and the changing need of the workforce.
- Studies by research centers funded by the Department of Education: The National Center for Research in Vocational Education studied reforms from the 1990 Perkins Act such as the integration of academic and vocational education, performance standards and measures, and school-to-work transition; the Center on the Educational Quality of the Workforce examined the employment outcomes of vocational education by linking state unemployment insurance data with school records; and the Finance Center of the Center for Policy Research in Education studied the interstate funding formula for distributing Perkins funds to states.

CONTACT: National Assessment of Vocational Education (NAVE)
Office of Educational Research and Improvement
Office of Research
U.S. Department of Education
555 New Jersey Av. NW
Washington, DC 20201

EUROPEAN COMMUNITY

Cross-Sectional Survey

Young Europeans in 1990. This opinion survey was conducted by the European Community Task Force on Human Resources, Education, Training, and Youth. The 1990 survey was the third in a series. The first study, conducted in 1982, surveyed a representative sample of 3,900 15- through 24-year-olds in the 10 European countries that made up the European Community; the second survey, conducted in 1987, surveyed a representative sample of 7,000 15- through 24-year-olds residing in the 12 European countries that make up the European Community. The 1990 survey questioned approximately 7,600 15- through 24-year-olds, representative of the 12 European Community countries.

These surveys contain similar data elements on respondent attitudes and opinions concerning a wide range of issues, including respondents' education, professional training, and participation and experiences in the labor force.

CONTACT: Commission of the European Communities
Task Force for Human Resources, Education, Training, and Youth
European Community Information Center
2100 M Street, NW #707
Washington, DC 20037

Appendix B

Vocational Education Data Information Sources Contact List

INTERNATIONAL ORGANIZATIONS

European Institute of Education and Social Policy
University of Paris IX - Dauphine
Place du Marechal de Lattre de Tassigny
75116 Paris

Organization for Economic Cooperation and Development (OECD)
Center for Educational Research and Innovation
2 Rue Andre Pascal
75775 Paris

Telephone: (33) 1 45 24 82 00

Delegation of European Communities
2100 M Street NW 7th Floor
Washington, DC 20037

Telephone: (202) 862 9500
Telefax: (202) 429 1766

European Centre for the Development of Vocational Training (CEDEFOP)
Bundesallee 22
Jean Monnet House
1000 Berlin 15

Telephone: (49) 30 884 120
Telefax: (49) 30 884 12222

European Information Network in the European Communities
Rue d'Arlon 15
13-1040 Brussels

Telephone: (32) 2 238 30 11
Telefax: (32) 2 230 65 62

Statistical Office of European Communities (EUROSTAT)
Bâtiment Jean Monnet
L-2920 Luxembourg

Telephone: (35) 2 43 01 1
Telefax: (35) 2 43 01 44 15

International Association for the Evaluation of Educational Achievement (IEA)
14 Sweelinckplein
2517 GK The Hague
The Netherlands

Telephone: (31) 70 346 9679
Telefax: (31) 70 360 9951

CANADA

British Columbia Ministry of Education
Communications Branch
620 Superior Street
3rd Floor Room 325
Victoria BC V8V 2M4

Telephone: (604) 387 4611
Telefax: (604) 356 5945

Canadian Education Association
252 Bloor Street West, Suite 8-200
Toronto Ontario M5S 1V5

Telephone: (416) 924 7721
Telefax: (416) 924 3188

Council of Ministries of Education
252 Bloor Street West, Suite 5-200
Toronto M5S 1V5

Telephone: (416) 964 2551
Telefax: (416) 964 2296

Employment and Immigration Canada
P.O. Box 9721
Ottawa Ontario K1G 4X8

Telephone: (613) 992 1300
Telefax: (613) 991 5050

Ministére de l'Education
Direction des Etudes Economique et Démographiqu
1035 de la Chevrotière 8th Floor
Quebec G1R 5A5

Telephone: (418) 643 3684
Telefax: (418) 646 5503

Ontario Ministry of Education and Training
Mowat Block
900 Bau Street
Toronto M7A 1L2

Telephone: (416) 325 1945
Telefax: (416) 325 1971

Statistics Canada
Ottawa K1A 0T6

Telephone: (613) 951 1500
Telefax: (613) 951 9040

FRANCE

Centre d'Études et de Recherches sur les Qualifications (CEREQ)
10 Place de la Joliette
B.P. 176
13474 Marseille

Telephone: (33) 1 91 13 28 28
Telefax: (33) 1 91 13 28 80

International Center for Pedagogical Studies (CIEP)
Division de L'Etudes sur les Systemes d'Education
1 Rue Leon Journault
F-92311 Sevres CEDEX

Telephone: (33) 1 45 07 60 82
Telefax: (33) 1 45 07 60 01

L'Institut National de la Statistique et des Études Économiques (INSEE)
18 Blvd. Adolphe Pinard
75014 Paris

Telephone: (33) 1 41 17 50 50
Telefax: (33) 1 41 17 66 66

GERMANY

Bundesinstitut für Berufsbildung
Federal Institute for Vocational Education
Fehrbelliner Platz 3
W-1000 Berlin 31

Telephone: (49) 30 8643 0
Telefax: (49) 30 8683 455
(49) 30 8621 375

Deutsches Jugendinstitute e.V. (DJI)
Freibadstraße 30
D-8000 München 90

Telefax: (49) 89 62306162

Carl Duisberg Society International
CDS International
309 W. Washington Suite 201
Indianapolis, Indiana 46204

Telephone: (317) 581 8807
Telefax: (317) 637 2441

German Information Center
950 3rd Avenue
New York NY 10022

Telephone: (212) 888 9840
Telefax: (212) 752 6691

The German Marshall Fund of the United States
11 Dupont Circle NW
Suite 750
Washington, DC 20036

Telephone: (202) 745 3950
Telefax: (202) 265 1662

Institut für Arbeitsmarkt und Berufsforschung (IAB)
Federal Institute of Vocational Training
Regensburger Str. 104
8500 Nürnberg 30

Telephone: (49) 0911 179 0
Telefax: (49) 0911 179 3258

German Youth Institute
Freibadstr. 30
8000 Munchen 90

Telefax: (49) 89 623 06162

Sample Institut
Forchung fürden Produktionsfaktor Information
INRA Papenkamp 2-6
2410 Mölln

Telephone: (49) 4542 801 342
Telefax: (49) 4542 801 301

ITALY

Centro per l'Innovazione e la Sperimentazione Educativa Milano (CISEM)
20129 Milano-corso
Concordia 7

Telephone: (39) 02 774 0290
Telefax: (39) 02 774 02941

Centre Studi Investimenti Sociali (CENSIS)
Italian Social Investment Study Center
Piazza di Novella, 2
00199 Rome

Telephone: (39) 6 8861 641
Telefax: (39) 6 8621 1367

Istituto Nazionale di Statistica (ISTAT)
Viale Liegi
N13 Rome

Telephone: (39) 6 88 41341

Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori (ISFOL)
Via B. Eustachio, 8
00100 Rome

Telefax: (39) 6 8547321

Pragma Sri
Market Research Company
Via Salaria, 298/A
00199 Rome

Telephone: (39) 6 84 13557
Telefax: (39) 6 85 40038

JAPAN

Employment Promotion Corporation
2-1 Kojimaehi Kyodaku
Tokyo 102

Telephone: (81) 3 222 8000
Telefax: (81) 3 578 1108

Japan Institute of Labor
Chutai Kin Building
1-7-6 Shibakoen Minatoku
Tokyo 105

Telephone: (81) 3 436 3491
Telefax: (81) 3 578 1108

US - Japan Culture Center
2600 Virginia Avenue NW
Suite 711
Washington DC 20037

Telephone: (202) 342 5800
Telefax: (202) 342 5803

National Institute for Education Research
5-22 Suimomeguro
6-Chome
Meguro-ku
Tokyo

Telephone: (81) 3 714 0111

Ministry of Education, Science and Culture
Research and Statistic Planning Division
Kasumigaseki Chiyoda-ku
Monbusho
3-2-2 Kasumigaseki
Chiyoda-ku
Tokyo 100

Telephone: (81) 3 3581 1547
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UNITED KINGDOM (England and Wales)

Center for Japanese and Comparative Industrial Research
Imperial College of Science, Technology and Medicine
South Kensington
London SW7 2AZ

Telephone: (44) 071 589 5111

Department for Education and Science
Analytical Services Branch
Mowden Hall Staindrop Road
Darlington Co.
Durham DC3 9B6

Telephone: (44) 032 539 2753
Telefax: (44) 032 539 2695

Institute for Employment Research
University of Warwick
Department of Education
Westwood Coventry CV47AL

Telephone: (44) 020 352 4416
Telefax: (44) 020 352 4110

National Commission on Education
Paul Hamlyn Foundation
Suite 24, 10-18 Manor Gardens
London N7 6JY

Telephone: (44) 071 272 4411
Telefax: (44) 071 281 6778

National Council on Vocational Qualifications
222 Euston Road
London NW1 2B2

Telephone: (44) 071 387 9898
Telefax: (44) 071 387 0978

National Foundation for Educational Research in England and Wales (NFER)
The Mere
Upton Park
Slough Berkshire SL1 2DQ

Telephone: (44) 075 357 4123
Telefax: (44) 075 369 1632

Office of Population Censuses & Surveys (OPCS)
St. Catherine's House
10 Kingsway
London WC2B 6JP

UNITED STATES

National Center for Education Statistics
U.S. Department of Education
555 New Jersey Avenue, NW
Washington DC 20208

Telephone: (202) 219 1828
Telefax: (202) 219 1736

FOUNDATIONS AND CENTERS

Brookings Institute
1775 Massachusetts Avenue NW
Washington, DC 20036

Telephone: (202) 797 6000
Telefax: (202) 797 6004

William T. Grant Foundation
515 Madison Avenue, 6th Floor
New York, NY 10022

Telephone: (212) 752 0071
Telefax: (212) 752 1398

RAND Corporation
P.O. Box 2138
Santa Monica, CA 90407-2138

Telephone: (310) 393 0411
Telefax: (310) 393 4818

U.S. Department of Labor
Bureau of International Labor Affairs
200 Constitution Avenue NW
Washington, DC 20210

Telephone: (202) 219 6043
Telefax: (202) 219 5980

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