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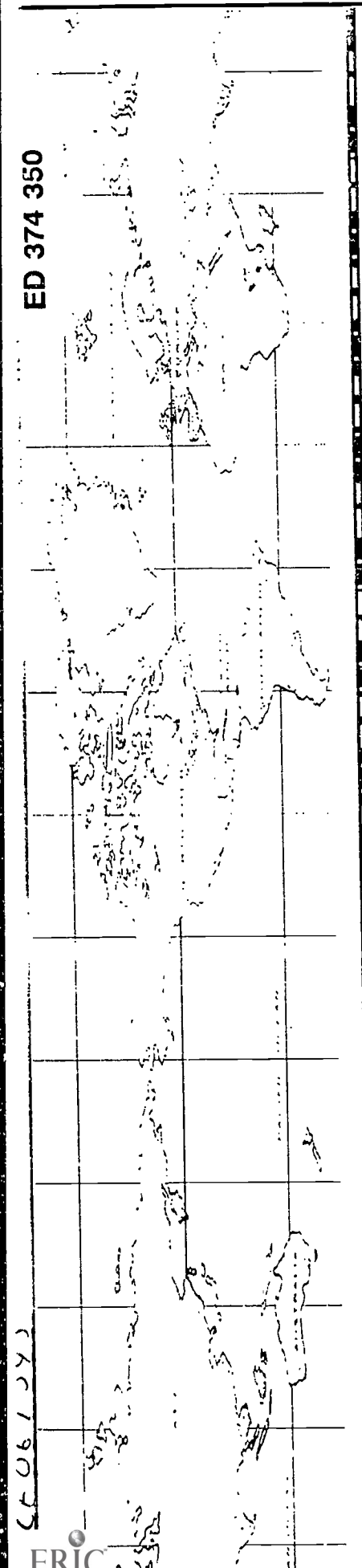
ABSTRACT

This report presents findings of an investigation of the design of programs and systems that prepare young people for work in Denmark, Germany, and Sweden. An introduction and overview of investigating programs and options for youth employment preparation are followed by a discussion of indicators embodied in a high quality program in school-to-work transitions: program completers experience high levels of success; quality inputs and up-to-date content and instruction ensure programs meet needs of youth and employers; flexible designs, diverse ways of organizing learning, and program supports ensure the greatest success for the maximum number; the program is structured to provide multiple options and decision points to accommodate changes in plans and emphasis, ensure development of broad-based skills, and provide access to higher education and further training; mechanisms exist for informed decision making by all partners; instruction reflects best practice and knowledge; and mechanisms are in place for ensuring accountability. The next three sections describe the essential elements of systems that support a high quality learning program of career preparation in Denmark, Germany, and Sweden. Each section discusses content and structure of the learning experience and strategies to ensure success and motivation of all youth (Denmark and Sweden) or challenges for the vocational system (Germany). Finally, conclusions and implications for practice and program design in the United States are drawn. (YLB)



Designing Quality Programs: International Lessons on Youth Employment Preparation

A joint project of the
Center for Learning and Competitiveness
and the
Council of Chief State School Officers

Center for Learning and Competitiveness
School of Public Affairs
University of Maryland

The Center for Learning and Competitiveness (CLC) works with American practitioners and policymakers to apply the lessons from international education and training systems to policy development and system design in the United States. Improving the level of workforce preparation is a crucial component to improving productivity levels, boosting economic competitiveness and raising living standards. By helping US policymakers and practitioners understand the best practices and current trends in other countries, CLC helps to ensure that American innovation builds on the experience of others and attempts to achieve outcomes of the highest international standard.

CLC's activities provide access to the people and materials that illuminate the critical principles and components of high quality education and training systems. The range of activities include arranging targeted study programs of international systems, undertaking strategic consultancies for organizations or government departments, leading conferences and seminars in the United States, and publishing reports highlighting best practice and innovative methods for system reform. As part of CLC international study programs, American participants meet with their international colleagues and counterparts to examine the components and configurations of well-integrated education and training systems. They gain new perspectives as well as gather specific tools and information that will directly strengthen practice in the United States.

A priority for CLC's work is the dissemination of findings from international investigations to the education and training community, business and union leaders, politicians, journalists and other opinion leaders in the United States. CLC also works directly with state governments and with leading policy organizations to ensure their reform strategies are shaped and influenced by the experience of quality systems in other countries.

Learning from the international experience has already played an important role in building consensus and developing key leadership for nation-wide development of school-to-work transition systems, and in providing technical assistance in the establishment of these systems. A focus on the performance of international education and training systems enables the United States to learn from other policy successes, to avoid reform paths that have been unsuccessful and to ensure that our innovation will place us at the forefront of international best practice.

CLC was founded in 1992 with a three year grant from the German Marshall Fund of the United States (GMF). CLC's Executive Director, Anne Heald, created GMF's acclaimed Program on Improving U.S. Competitiveness, and has ten years of experience in running influential exchanges between the United States and Europe. The distinguished Advisory Board to CLC consists of leaders from American political, business, government and union sectors. The work of CLC is also supported by other foundations, state and federal governments. Support is also provided by the University of Maryland's School of Public Affairs, where CLC is based.

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Designing Quality Programs: International Lessons on Youth Employment Preparation

A Report of the Designing Quality Programs Team of the Comparative Learning Teams Project

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PREFACE

In February 1993, CLC brought together 25 leading experts from state and federal organizations as well as international leaders, to identify the most pressing questions and problems that confront policymakers and practitioners working to build school-to-work transition systems in the United States. The outcome of that meeting was a consensus that there were five areas in need of immediate in-depth attention:

- Building a System: Governance and Finance
- Developing Standards, Assessment and Credentialing
- Building Partnerships: The Role of Economic Actors
- Designing Quality Programs
- Providing Career Guidance

To address these issues, and with the generous financial support of the German Marshall Fund of the United States, CLC initiated its Comparative Learning Teams Project. CLC issued a request for proposal nationwide, and respondents were asked to select one of these areas as the focus for an international learning investigation, developing levels of inquiry in substantial detail and with specific outcomes for their trip. The capacity of teams to effectively disseminate their findings in a way that would positively impact on the development of school-to-work systems in the United States was a key selection criteria.

CLC awarded grants to five organizations in the school-to-work transition field who led, planned and supported a Comparative Learning Team. The grants enabled each team of at least nine people to visit two European sites where sophisticated school-to-work transition systems operate. Each comparative learning team participated in carefully planned 12 to 14 day working sessions in Germany, Denmark, the United Kingdom, Switzerland and Sweden, where they gained direct access to their foreign counterparts and first-hand exposure to European systems.

The members of the learning teams consisted of leading resource people and experts who are catalysts for change in their field at local, state and national levels. Whether they were from the private sector, non-profit organizations or government, team members sought answers to the key strategic issues facing the development of quality school-to-work transition systems in the United States. Hosts in Europe commented on the clear focus of comparative learning team investigations around the pressing lessons of importance to American policymakers. A conference held in January 1994 allowed comparative learning team participants to discuss and refine their reports and findings, and to compare observations about international practice.

Already, the work of the comparative learning teams has had an impact on system-building in the United States. Team members were able to build on their European experience when designing state systems under the guidelines of the new Federal School-to-Work Opportunities Act. Officials in the Departments of Labor and Education, working on school-to-work policies, were briefed by one team member about the comparative learning teams project and team members' observations of European systems. Participants have spoken at numerous conferences, and published comments in newspapers and newsletters. Key findings of the teams are guiding further policy work around key issues such as the engagement of industry in school-to-work programs and in the design of skill standards.

CLC is now pleased to publish the five reports of the comparative learning teams. Each report highlights what the specific team found in their field of investigation, and particularly highlights the implications for American policymakers of European experience. We believe that they will be of equal interest to those who have examined the European models for workforce development previously and those who are being introduced for the first time to international expertise in this field.

For over a decade, American policy leaders have looked to Europe for insight into how to move young people effectively from school to the workforce, while providing them with relevant and valuable skills. The impressive achievements of European systems triggered much enthusiasm in this country about the potential positive impact of reform here. Many supporters of school-to-work reform in the United States first became excited about the potential impact of reform by looking at international best practice and some of the most innovative models of school-to-work transition grew out of exploring European sites.

Now, with the passage of the school-to-work legislation, and with states actively attempting to build school-to-work transition systems that will provide widespread opportunities for young people, the international experience remains highly significant. Issues that challenge American policymakers in building systems, such as developing appropriate funding mechanisms, engaging industry partnership and ensuring relevant standards, have long been at the core of investigation in Europe. Reform in European systems in recent years reflects current thinking about the delivery of quality school-to-work opportunities.

These reports are timely and relevant for American policymakers who not only want to look at the achievements of quality European school-to-work systems, but to explore in more detail the elements that enabled such systems to achieve quality outcomes. As states and sites move to implement comprehensive reform in the United States under the auspices of the School-to-Work Opportunities Act, all five reports will provide valuable information and insight into the best international lessons.

In releasing these reports, CLC would like to thank the German Marshall Fund of the United States for their generous support of the comparative learning teams project. We want to express our thanks to the lead organizations for the project: The Austin Chamber of Commerce, the New Standards Project, The Council of Chief State School Officers, the National Alliance of Business and the Northwest Regional Educational Laboratory.

In particular, we would like to thank the leaders of the five teams who generated such quality learning programs for their teams and led the process of developing these significant reports. To Bob Glover, Davis Jenkins, Glenda Partee, Esther Schaeffer and Larry McClure, our sincere thanks for your dedication and commitment to this valuable learning process.

Anne Heald
Executive Director
The Center for Learning and Competitiveness

EXECUTIVE SUMMARY

During November of 1993, the Quality Programs Team of the Comparative Learning Teams Project investigated the design of programs and systems that prepare young people for work in Denmark, Germany, Sweden and Switzerland. The team sought to identify the program and system components within schools and their partner organizations that are essential to ensuring a quality education and training experience for young people. We were particularly interested in how the process and support structures within government, schools, firms and trade associations contribute to the overall quality of system outcomes in preparation of a skilled workforce.

This report describes the essential elements of youth apprenticeship and other programs that use the school and the workplace as collaborative institutions for the preparation of youth. We had the privilege of having a team that is deeply engaged in developing some of America's leading models in this area. The report synthesizes our diverse perspectives and experience in an effort to connect what we learned about Europe to our ambitions for education and training in the United States.

The Challenge Facing American Programs

The American experiments in youth apprenticeship over the last decade generated considerable interest in the capacity of these programs, and other school-to-work efforts, to develop skill proficiency and to increase academic achievement in young people. These demonstrations have developed a variety of mechanisms to redesign and adapt some traditional European models to American circumstances. However, European models are changing. The countries we visited are all redesigning their systems to adapt to their changing economic and industrial circumstances. We felt that it was important for practitioners in this country to understand what those changes are, why they are necessary and how they affect the actual delivery of programs. At a time when the education and policy field is focused on building national and state systems out of a tangle of programs and projects, the Europeans are seeking to fine-tune systems that take credit for securing their economic strength.

Unlike the European models we saw, American models have each had to create their own curricula, staff development plans, and community partnerships. The lack of institutional collaboration in this area hobbles our efforts to expand our best programs into larger systems. Our efforts to develop youth apprenticeship curricula have been delayed by the absence of a body of skills standards across a range of industries to inform local training and education efforts. We also lack the necessary decision-making and consensus-building bodies within and across employee unions, employer groups, schools and governments that work to update these standards, align them with basic and technical education in the schools, and provide appropriate methods of assessing and credentialing youth in the mastery of these skills. In addition, these initiatives rely on some existing structures such as career academies or prep tech to strengthen or develop school-to-work opportunities for their students. Yet few have fully integrated the school curriculum and the work curriculum into a comprehensive program of study.

Among the lead efforts grappling with the integration of school-based and work-based education is the Pennsylvania Youth Apprenticeship Program. Along with the Learning Research and Development Center at the University of Pittsburgh, program designers are developing a curriculum that will provide young people with a portfolio of marketable skills and competencies across a broad cluster--manufacturing, engineering and support--that will continue to grow throughout their working career. This broad cluster concept reflects the way business is restructuring the future workplace and provides guidance for how secondary schools should focus their curricula in line with the domain-specific skills and knowledge gained in the workplace and in postsecondary institutions.

Another pioneering effort is the Cornell Youth and Work Program that operates a Youth Apprenticeship Demonstration Project in Broome County, New York. The project engages young people beginning in their junior year of high school in manufacturing and engineering technology, health care, and administration and office technology. Project purposes include educating youth for the future, improving the quality of the workforce, and testing adaptations of European apprenticeship to the United States. Work-based learning is organized around the attainment of specified personal, social and technical competencies and continues through two years of community college. Research has been a key part of the project from its inception, not only to monitor its development but also to feed back information immediately for project improvement.

These programs, along with others that are emerging, require continuous guidance and nurturing to strengthen their strategies to support learning in the workplace and to integrate it with learning in the school. The European experience reinforced our belief that these individual programs also need to be linked more aggressively to advances in school reform, new research on strengthening curricula and teaching, strategies to train and retrain adult workers and general economic and labor market development.

Our new national legislation reflects a growing commitment to linking education and training at all levels. Several industry sectors are creating standards for training. States are designing systems for school-to-work transition. Companies are experimenting with redesigned work systems and flexible manufacturing. School reforms are pushing the curriculum towards more experimental and project-based learning to develop critical thinking and teamworking skills. As we pursue these different initiatives, our challenge will be to make them make sense as a comprehensive whole. We can learn how to face this challenge from the European example.

Indicators of Quality

Through our investigation, our team came to a general consensus on the qualities that indicate a high quality program in school-to-work transition. We believe that these indicators can serve

as guides for American practitioners, like ourselves, who are working to structure programs and design effective systems. High quality programs embody the following qualities:

(1) Program completion guarantees mastery of in-demand skills, respected credentials, and a high probability of employment or further training leading to employment with career potential.

(2) Quality inputs and up-to-date content and instruction ensure that programs meet the needs of youth and employers.

(3) Flexible designs, diverse ways of organizing learning, and program supports ensure the greatest success for the maximum number of young people.

(4) Multiple options and decision points exist throughout the course of study to (a) accommodate changes in plans and emphasis, (b) ensure the development of broad based skills, and (c) provide access to higher education and further training.

(5) Mechanisms exist for informed decision-making on the part of youth, their parents, schools and firms, and at all levels--federal, state and local.

(6) Instruction reflects best practice and knowledge in the occupational field.

(7) Mechanisms are in place for ensuring accountability and best effort of the various entities involved in delivering and receiving instruction.

CONTENTS

INTRODUCTION

The Task

The Quality Programs Comparative Learning Team brought to this project broad knowledge of both the efforts underway within our own country and the strengths, limitations and parameters of our existing programs and resources. Our task was to look critically at the content of the school and worksite curricula, and the processes and relationships that sustain programs of youth employment preparation in the European systems we studied.

Our objectives were to identify and report:

(1) What these systems expect students to know and be able to do upon completion of a youth apprenticeship, including access to other study and employment options.

(2) The various perspectives from businesses and business organizations, schools, employee organizations and government that come into play in developing, revising and implementing youth employment preparation schemes.

(3) The processes by which these diverse perspectives produce a coherent set of school and on-the-job experiences that provide for consistent results in what successful trainees can do and perform at the conclusion of the learning experience.

To understand the design of quality programs, it was important to develop a context for the learning systems we were investigating. This context includes an understanding of the:

- Basic education and prior preparation, including knowledge about careers and career pathways, that young people bring to the employment preparation scheme.
- Expectations and incentives on the part of young people and training providers that fuel a successful apprenticeship or career preparation experience.
- Assumptions made about the trainee and the supports provided by government officials, training providers, teachers, and parents, that contribute to that successful experience.
- Reforms and specific concerns within the countries that support these expectations and outcomes.
- Methods by which various stakeholders coordinate and support a cohesive system of employment preparation.

We began with a list of specific research questions to frame our study, such as:

- What elements of the system support a quality learning program of career preparation?
- How is integration of academic and occupational instruction achieved?
- What must teachers and mentors or coaches in the workplace know and be able to do to ensure student and program success? How are teachers and worksite supervisors trained and supported?

We asked individuals involved in different aspects of the systems, whether, Meisters, mentors, school administrators and teachers, or union or government officials, what features they felt were essential to quality programming. Where possible we have contextualized this information, providing further information on the foundation experiences of youth, the broad reforms taking place within the countries visited, and the roles of various sectors.

Where and how we sought our answers

To get the answers we sought, it was necessary to get the "big picture" on policy, research, supports, staff development and design of the system. In Germany, this meant visiting the Federal Institute for Vocational Training (BiBB), the Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder*, the Federal Ministry of Education and Science (BMBW), and the Federal Institute for Labor (BA). In Denmark, this involved visits to the Ministry of Education and Research; and in Sweden, visits with representatives of the National Agency for Education, the Ministry of Education, and the Swedish Employers' Confederation (SAF).

Next we sought input from representatives of institutions charged with developing, overseeing and implementing curricula and assessments, such as Chambers, trade associations and committees, labor and professional organizations, and research centers. We also visited schools, training centers and firms to observe programs and to interact with teachers, supervisors, trainers, meisters, apprentices, and others. This allowed for investigation of the national structure under different circumstances. We visited a number of vocational schools with different occupational focuses. This included schools that prepare individuals to pursue careers in office administration, retail and other commercial endeavors, schools that provide preparation for technical careers, and schools that offer compensatory education and alternative experiences in lieu of worksite experience.

Finally, we visited a range of small and large firms with various capacities for in-firm training and different needs for extra-firm training and vocational school support. Some had vast training budgets, specialized training personnel and equipment, and capacities for rotating trainees through a range of departments, plants and training activities. Others were small or medium-scale operations with strong and intimate Meister/trainee relationships built around the

firm's immediate production requirements. Additionally, the firms were representative of different occupational sectors, such as manufacturing, heating and plumbing system design and services, such as finance and banking, office administration and information technology.

We were able to examine the relationship of these businesses to vocational schools and their respective roles in imparting practical and theoretical knowledge. We were also able to study the supports that schools and businesses received from the public and private sectors in fulfilling their roles in the preparation of young people.

Which countries and why?

Denmark was selected because it is in the midst of reforms initiated in 1991 to broaden the skills of workers and build greater flexibility into their system of occupational preparation. Specifically, the Danes have reduced the number of vocational streams from 300 to 87 and are making further reductions in order to allow wide latitude in options for movement to various occupational pathways or into further education. A great deal of emphasis is placed on helping students acquire a broad theoretical and technical knowledge base while specialization is gained through the workplace.

Also of interest is the rather complicated "sandwich system" of school and work-based learning the Danes have designed. It contains opportunities for side trips and further explorations for the undecided, more direct approaches for the more committed, and various pathways that lead to similar ends. Finally, the Danes really seem to believe in education broadly conceived as a major mechanism for liberating the individual, providing choices in occupation and in the way he or she contributes to society, as well as a way of addressing the needs of the labor market.

The **German** system is largely dependent on the private sector for much of the employment preparation of its youth. Germany was selected for study because of its well-known and well-developed dual system of school- and work-based learning. However, equally as important and less well-known are its programs of full-time, school-based study for a number of occupational areas. Germany is of interest because of the strong and interlocking elements that support a consistent and quality learning experience nation-wide and because of how these elements are tied into a very proactive labor policy focused on averting unemployment and ensuring training for all. Also of interest are the incremental changes being made in this very traditional system in order to accommodate greater flexibility and increase options for young people to move between the dual system and higher education.

Sweden was selected based on recent reforms in upper secondary level education that stress student preparation for working life and further studies. This has included the restructuring of occupational pathways into sixteen national programs (course-oriented learning modules). This approach has implications for occupational education in the United States. We are examining how to structure occupational knowledge broadly and integrate it with academic knowledge so that young people, upon graduation from our secondary schools, are prepared to enter career employment or continue into postsecondary education.

We were also interested in the Swedish system because it is primarily school-based, much like our own. Recently they required that students in the vocational pathways spend 15 percent of their program time in a firm or place of public employment. We were interested in learning of strategies for using the worksite as a learning environment to reinforce and complement school-based learning.

Finally, we were greatly interested in structuring programs that ensure participation and success for all our young people. We had some knowledge of the extent that the Swedish system provides for ample and diverse learning places for young people that ensure their development as productive adults, and we wanted to learn more about the practices, policies and alternative learning structures that support this commitment to all young people.

One member of the team visited apprenticeship sites in **Switzerland** to focus on work-based learning structures in three industries: banking, manufacturing and engineering technology, and hospitality. Switzerland has made notable progress in adapting its apprenticeship system to the need for workers with multiple skills and readiness for lifelong learning.

INVESTIGATING QUALITY PROGRAMS AND OPTIONS FOR YOUTH EMPLOYMENT PREPARATION

We embarked on this study with an open mind. However, we did have expectations for the types of experiences that we wanted for young people in the United States at the ages comparable to those of the youth in the European school-to-employment systems (16 - 22 years old). Thus the time frames of the occupational training systems in these countries are comparable to the time that American youth are in their last two years of secondary school and continuing through to completion of the two-year associates degree or the four-year baccalaureate degree. The difference, however, is that European youth spend a much greater proportion of this time period in work-based learning situations.

It was difficult to determine comparative levels of achievement and career exploration of the average American and European 16-year-olds. However, it was our impression that young people in European countries complete compulsory education with a more uniform body of knowledge than comparable groups of American teenagers who are in their sophomore or junior year in high school. This is possible because of a more standardized curriculum and a more uniform method of financing education. **More importantly, however, it was our sense that in these countries, there is a broad consensus that youth have value and that their education is an investment in the country's future--an investment that all sectors of the society must actively support. As a result, all youth, not just a small portion, are accorded the best education possible--though it may take a variety of forms.**

The fact that most of these systems make in-firm training a major component of the total education and employment preparation scheme for youth, means the quality of the programs are largely dependent on the willingness of businesses to function as places of learning. In each country, we observed strategies for creating opportunities for quality work-based learning and interventions in response to a shortage of these opportunities. Interventions included simulated work environments that did not always result in a successful transition of the trainee into a real job, incentives to firms to provide training places, and technical assistance to them in their efforts.

Beyond the capacity of firms to support youth employment preparation, additional factors affecting the total program include the quality of the vocational school, the regional/local labor market, and the involvement of Chambers and other sources of support to schools and firms. Still, the pervasive attitude is that some training, though it may not have the optimum qualities desired, is better than no training. Each country is tackling the problems in its own system in ways that help to inform our efforts. Despite their stages of development or levels of success, we were impressed with the lengths to which these countries are willing to go to ensure that youth in the latter teenage years are not abandoned--that some form of programming exists to address their needs and to provide opportunities for an independent and productive life.

DISCUSSION OF INDICATORS OF QUALITY

1. Upon program completion, participants experience high levels of success.

"Success" includes mastery of in-demand skills, respected credentials, and a high probability of employment or further training leading to employment with career potential. In effective programs, training firms, schools and trainees expect high performance levels. Supports are provided to help achieve high performance and program completion. In the systems studied, we found that program and trainee success are driven by a number of factors and conditions.

- *Performance counts and is rewarded. There is a clear link between what youth learn at school and what they have access to after school.*
- *There are also incentives for participation and for achievement of trainees, firms and schools.*
- *There are repercussions for poor performance. In Denmark and Germany, firms are held accountable for the success of trainees on final credentialing examinations and must retain trainees in their employ and support their further preparation until they are successful.*
- *Education is free, so financial barriers to participation are minimized and the work component of the training programs in Denmark, Germany and Switzerland guarantees a trainee wage.*
- *Due to the culture and tradition of business involvement in youth training, many firms consider it their social responsibility to provide instructional opportunities for youth and also in their best interests for guaranteeing a cadre of well-qualified future employees.*
- *Because the programs formally structure on-the-job learning into the program design, by program completion, trainees have extensive experience in a workplace, thus making graduates more attractive to employers.*
- *Competition for students and access to programs drive the quality of the experience, as well as student achievement.*

In Sweden, students and their parents select the most appropriate school based on the school's reputation, areas of expertise and the convenience for the family. Schools compete for students, and public funds follow the child. Schools have the option of developing additional programs based on local needs and student interests. As a consequence, vocational schools aggressively promote their attributes, effectively communicate with parents and ensure that they are delivering quality education at high standards. They know they must perform well to attract students and remain viable.

In Germany, some of the best in-firm programs are the most competitive and may lead to company sponsorship of further education once the trainee has passed the initial credentialing exam.

2. Quality inputs and up-to-date content and instruction ensure that programs meet the needs of youth and employers.

Strong federal standards governing the content of training areas with appropriate mechanisms for timely revision and communication to training providers ensure that knowledge and practices reflect current and future standards. Though significant work may remain to be done locally on the implementation and adaption of curricula in schools and places of employment, guidelines are clear and authoritative and serve as minimum requirements for training firms and vocational schools. In this manner the relevancy and efficacy of programs is maintained.

- *Instructional strategies and technical processes are maintained current through active participation of firms, Chambers and employee associations.*

- *What is to be taught is clear and constant throughout the country.*

The major elements of quality control for the German dual system include federal regulation of occupational content, a national syllabus and the final exam. Guidelines tell what a skilled worker should know and be able to do without guidance at the end of the preparation period. These outcomes are determined based on the research of the actual workplace. If the employers and unions agree on what these outcomes are to be, they become the training standards for that particular profession. In this manner, standards are established for common content and expectations across the country. The training syllabi and final exams are updated periodically in keeping with best practices in the occupational areas. The content of instruction, set out in the syllabus, is taught by Meisters in firms, vocational schools, and local training centers. The final examination assesses the competency of the apprentice with respect to this knowledge.

In Denmark, the Council for Vocational Education works with the National Conference of Unions and the Confederation of Danish Industries to develop the overall mission and vision for the system, approves new programs, allocates funds, and provides general direction for occupational programs. Company expectations are described in detail in the framework of agreement that exists between the company and the trainee.

In Sweden, government authorities exercise significant control over the content of what is taught by centralizing influence over the curriculum frameworks. The Ministry of Education sets the mission and goals for education, including the learning objectives and a required set of core courses. The National Agency for Education is responsible for taking the mission and goals and developing a national plan.

3. **Flexible designs, diverse ways of organizing learning, and program supports ensure the greatest success for the maximum number of young people.**

Essential features of programs include accommodation of different learning styles and different ways of organizing instruction so that it results in meaningful learning; the availability of different time frames and routes to the same credential; and alternate structures and supports for youth with special needs. Meaningful learning drives student and stakeholder motivation. Continuous mentoring supports individual student effort. Choice and incentives to tackle more challenging work are imbedded in many instructional activities. Upper secondary schools (in Sweden) are community-based serving adults as well as students. In the systems studied, we found:

- *There is formal recognition of differences in individual learning styles and the learning program is structured to accommodate these differences.*

This stems from genuine respect for learning gained in an on-the-job setting and a strong belief that theory will come as a result of practice. Depending on the country's particular school-to-employment design, this way of learning is given equal, complementary or dominant status to school-based, academic learning. The structure of the learning plan around practical and theoretical training provides learning in different conditions, which expands the number of opportunities for individual success for students with diverse learning styles.

In contrast, in the United States, the general practice is for schools to teach theory first and have practical experience follow. Moreover, opportunities for the latter are often distanced in time from the initial theoretical knowledge. In Germany, Denmark and Switzerland, the vocational educational system operates from the opposite perspective. The belief is that practical, hands-on activities can be taught first to be supported by subsequent instruction in theory.

Academic content is taught when and as it applies to the practical learning required. For example, algebra, geometry and trigonometry are not taught as sequential subjects, but as unified courses provided on a necessary-to-know basis. Theoretical or applied courses are structured by their relevancy to the occupational area of study. For example, in a technical college in Denmark, all electronic mechanic trainees take a special math course that is relevant to their study of electronic mechanics.

In accommodating the interests of students, Sweden has moved to the point of customizing training programs by providing individual choice options designed by the student based on interests and needs. Generally, however,

- *Programs provide for continuity and student support by keeping students together in the same vocational program and with the same teachers or mentors over a multiple-year period. This enables an adult to consistently provide social and emotional supports and for a trusting and consistent relationship to evolve.*

- *Projects and whole work tasks are used to increase interest and learning at school and the workplace.*

Observations at several sites showed youth engaged in work requiring group problem-solving and teamwork. In Denmark and Sweden, vocational instruction is organized around products and projects. In Sweden, students spend time in special projects to study areas of interest and to develop investigative skills.

Some firms in Switzerland organize learning for the purpose of better engaging and motivating trainees through project work and exercises in research and investigation. For example, a manager at one Swiss bank cited plans to engage the middle year apprentices in a project to devise a solution for a mailing problem to provide better services to clients. Also, managers are encouraged to develop assignments for apprentices that require gathering information within the company. These assignments are considered a means of understanding the total company and reinforcing self-directed learning that requires problem solving, planning, and initiative.

- *Mentoring and additional coaching are provided by teachers and Meisters.*

Youth not only have access to teachers in vocational schools but also to individual mentors and coaches in the workplace. These mentors and coaches guide the development of trainees' technical knowledge and interpersonal skill development.

An observation at ABB, a Swiss firm, showed a high degree of personal interaction between the trainer and the youth as the apprentice worked on a computer drawing exercise. The mentor let the trainee puzzle over the problem and try solutions, encouraging her questions as she made slow progress. The mentor later explained this behavior, saying you have to stand back and let the youth try to figure out problems themselves. A firm owner in Germany typically discusses trainee progress with parents and vocational school staff and views the training and nurturing of his apprentices as his responsibility, as well as the only way of getting quality employees.

- *There are different time frames and routes to the same credential.*

The optional tenth year of compulsory school found in Denmark and Sweden allows for further decision-making, the building of foundation skills, and opportunities for youth to acquire additional credentials that may improve their access to and success in upper secondary programs. This optional year is taken by a large number of students with no stigma attached. It indicates a willingness on the part of the community to adjust the timeframe of learning to accommodate youth development. This willingness to use different timeframes to the same end is seen in the multiple pathways by which young people may prepare for particular occupations--some taking three, four, five or more years to reach the same goal.

- *Alternate structures and supports are available for youth with special needs.*

Workshops and school-based simulations are provided for youth who cannot find placements in workplace settings. Special placements are made in firms with government support and special incentives provided to get firms to sponsor youth. In Germany and Sweden, special mandates are made to government agencies to do what is necessary in the way of remediation, language training, and travel and accommodation stipends needed by youth to pursue successful training. It was our impression that teachers do not lower standards so that students can meet them, but instead, resources are available for students to receive additional assistance to rise to the standards.

In Sweden, there is little or no penalty for making a wrong choice. The education system is free and has multiple reentry points. All youth under the age of 20 must be provided an upper secondary education and those who do not enroll can receive further education in youth centers. The centers have the responsibility for tracking these young people and doing whatever it takes to get them back into a school or training situation.

4. **The program is structured to (a) provide multiple options and decision points throughout the course of study to accommodate changes in plans and emphasis; (b) ensure the development of broad based skills; and (c) provide access to higher education and further training.**

- *Each country is beginning to eliminate narrow specialization in many apprenticeships and training programs and create broader occupational titles and programs so that youth can perform more complex tasks and move more easily among postsecondary options.*

This assumes a sequence of instruction that builds a foundation of broad-based general knowledge with subsequent specialization which in itself contains a number of options or pathways. In this manner, decisions are rendered less costly and explorations and missteps will still count in the long run. In Germany, theoretically, trainees may move into different occupations or move from an apprenticeship to the university system, but in reality this is rare. Also, since we are confining ourselves to a youth population and assuming opportunities for life-long learning, further specialization may not come until the individual is well into their 20's and beyond. The German apprenticeship leads to a journeyman credential and eligibility for Meister training. The Meister level of specialization is usually attained following a period of five working years and is completed when the individual is in his/her late twenties.

- *Critical to maintaining multiple options is ensuring that no decision results in a dead end or requires major backtracking and that there are distinct links to the next . of organized learning.*

In Denmark, each upper secondary school option leads to either higher education or occupational certificates. Youth pursuing the latter, can also find a pathway to higher education. Increasingly, policy discussions in Germany focus on ways to allow graduates of the dual system to enter the university. The new design of the upper secondary syllabus in

Sweden forces every student to select a specific occupational area of study (including those that prepare for university education) which ensures a place in the system, and gives a focus to work without limiting options for future career choices. Whether vocationally-based or academically-based, there is a core set of subjects that all young people must take. In Sweden, all of the upper secondary national programs articulate with post secondary level education.

5. Mechanisms exist for informed decision-making by youth, their parents, schools and firms, and at many levels--federal, state and local.

- *There is widespread understanding of the principles of apprenticeship by people at multiple levels across diverse institutions.*

In Denmark, Germany and Switzerland, people at all levels and in all organizations referred to the same principles when describing their roles and the operations of their organizations in relation to apprenticeship, even though roles and operations differed greatly. The cultures' adoption of the principles behind apprenticeship undergirds the widespread support for apprenticeship as a successful transition system for youth to adulthood. Apprenticeship will only be possible in the United States to the extent that people in multiple organizations playing multiple roles can truly grasp the principles and translate them into daily practices in the work-place and in the schools.

- *A mix of partners participate and take an active role in all aspects of setting standards, determining syllabi and implementing programs.*

Teamwork, discussion and consensus building are valued at all levels and there is willingness to work out conflict and shape programs to conform to the expectations of many sectors of society.

- *There is broad information exchange.*

Information about programs, their structure and requirements is clear and accessible at an early stage in the decision-making process. The pattern of information exchange is multi-directional among trainees, their parents, firms and schools. The provision of early and continuous guidance, mentoring and assessments maneuvers the youth through and past critical decision points.

In Sweden, employee and employer associations have full-time liaisons whose sole responsibility is to maintain active connections with the various levels of the education system from federal to local. Also, informal channels of communication exist between employers and schools. Parents are routinely involved in finding work placements at their own worksites and creating opportunities for job shadowing. By the end of their 9th year, students are prepared to make a "choice" concerning their next step because in grades 7 through 9, they have spent one week a year in the world of work. Within that week, each student spends time in a particular sector (industry, trades, service). Each school also has an "informer" who is familiar with the labor market and who is responsible for educating students about their upper secondary choices.

In Germany, vocational guidance begins in the last two years of compulsory education and is provided by representatives of the department of labor. There is opportunity for "getting to know" periods of one to four weeks in which students may visit companies to help inform their occupational decisions. Students also take a work studies course to gain information on the functioning of the economy and companies and other information such as the purpose and functions of trade associations.

- *Information drives the selection process for firms and trainees.*

Firms select trainees based on their own internal criteria much in the way they choose employees for the particular skills and competencies they bring to the workplace. Often more important than the academic background of the applicant are indicators of deportment and the ability to support a team effort, as well as the support that can be expected from families to ensure the continued and successful participation of the trainee.

Training is an investment for the firm and firms want to make the best choice that justifies that investment. Whether the selection process used is formal or informal, firms tend to have an idea about the type of individual they want to make a part of their enterprise. Although the selection process may seem biased by admission standards in the United States, a selection process that reflects the needs and goals of the program provider (within the parameters of our own equal employment and equity laws) and matches it with the skills and interests of the youth is a strong incentive for employer participation, commitment and success for youth in the workplace.

Likewise, trainees select firms, based on the quality of the program and benefits derived from affiliation with a company. The trainee as consumer is helped along by entities such as the department of labor, Chambers and works councils in Germany which monitor training firms and trainee placement, and function as trainee advocates.

- *The structure or design of the program can serve to inform student decision-making.*

An example of structure is the optional 10th year discussed above, and in the Danish system, the provision for an extended introductory period in a vocational college immediately following compulsory education where the youth is given an opportunity to explore a number of occupational fields. A similar option exists in the German basic year of school-based vocational instruction. Also, the one-on-one mentoring which characterizes the apprenticeship process is another vehicle by which the youth receives on-going advice and information.

6. Instruction reflects best practice and knowledge in the occupational field.

The system provides strategies and criteria for ensuring best instructional practices, learning environments and supports for the delivery of instruction.

- *Integration is multi-faceted and fully supported.*

The strongly work-based systems of Denmark and Germany are striving to attain equality (a) between work-based and school-based programs of study, and, in many cases, (b) between Meister and trainers or teachers who are university/technical graduates. There is also effort to foster greater cooperation between theoretical and practical teachers.

Sweden, whose system is primarily school-based, is trying to institute reforms that require vocational students to spend at least 15 percent of their secondary school time in on-the-job study. The purpose of the new on-the-job requirement is as much to expose young people to real workplace activities as to get employers more invested in vocational programming and to bring schools and businesses into a closer relationship. Further, funds for education now follow the student in ways that enable firms to create their own schools and take further responsibility for occupational training. Among the features that seem to facilitate the integration of academic and vocational studies within the Swedish system are: a block instructional schedule that gives students the necessary time for theoretical and practical studies relating to their national program; a school structure of "houses" built around the program clusters that makes it possible for teams of vocational and academic teachers to work together; and the strategy of imbedding academic instruction into occupational instruction

- *Firm training programs invest in the future generation.*

A real commitment to youth training can be seen in training centers in Switzerland and Germany. These centers have highly qualified staff, impressive facilities, and extensive up-to-date teaching aides and instruments, curricula and machinery. Classrooms are clean and grouped seating arrangements invite teamwork and problem-solving and instill the value placed on learning. Attractive spaces for apprentices, teachers, trainers, and employees affirm the special value of human life, a caring sense of community and a climate of warmth, closeness and professionalism.

- *In-firm learning is structured to allow broad skill development and multiple supports for learning.*

In addition to having the capacity to develop and conform to a training plan in keeping with the national standards, training firms should be able to offer the full body of knowledge representative of an occupational field. There must also be suitable mechanisms for conveying this knowledge to trainees. This means there must be suitable numbers of trainers with appropriate education, technical and pedagogical knowledge.

- *Credentialing, monitoring and technical assistance to firms support quality improvement.*

Not every workplace is a quality learning environment and standards exist that determine the capacity of the firm to provide the required learning sequence. For example, to be a training firm in Germany requires certification by the appropriate Chamber and in Denmark licensure by the state. In this regard, firms are helped to stay current with respect to practice and

technology through the resources and efforts of Chambers, federal agencies (e.g., the BIBB, departments of labor, etc.), and unions.

- *Initial teacher/Meister training and mechanisms for keeping them up to date support the quality of instruction.*

In Germany, all teachers in vocational school must have academic diplomas from the university, two years of teacher training, and on-the-job practical training. In-firm trainers must have both personal/character qualifications, professional certification in an occupation or its general field, and certification in pedagogy. In-firm trainers may also be Meisters, who must be certified in pedagogy and also have passed the three-part Meister exam proving the capacity to manage production as well as to train. Meisters' responsibility for production forces them to update their skills and knowledge but vocational teachers do not have similar pressures and may not do so. In this area, union resources and Chambers have been helpful in providing supplementary training for vocational school teachers and information on changing work processes.

7. Mechanisms are in place for ensuring accountability and best effort of the various entities involved in delivering and receiving instruction.

No matter their role, it was our observation that all concerned with the process felt a sense of responsibility for the apprentices' learning. The across-the-board acceptance of responsibility for the education and training of the young person proves the "glue" that makes all elements reinforcing and accountable for success.

- *Accountability and responsibility are built into the system.*

The German and Danish systems are dependent upon several linking elements. The German apprenticeship program is state-controlled, business developed and delivered, and culturally supported. Firms are willing to accept responsibility and are allowed to have responsibility. With the exception of Sweden, firms are held accountable for trainee performance, but they are also allowed to manage this responsibility as they see fit. Responsibility and a sense of ownership are achieved by having businesses involved in determining what is taught, by participating in the instructional process including providing major financial support, and by creating methods for determining and monitoring their own sector's behavior and quality.

The supporting components of the preparation process are the vocational schools and training centers. Vocational schools and training centers play important supporting roles, but they are not "on the line" like the Meister and the firm.

- *Each European country visited has institutional arrangements and people in place within those institutions that show a real willingness and common interest in working together in partnership.*

For example, "inspectors" (a title likely to put-off American firms) in Denmark work with the social partners to determine the occupations and standards for training programs. The inspectors see their role as facilitators in determining standards and helping to resolve problems if all parties are not upholding their obligations. They facilitate investigations into complaints about learning at schools or firms. Consultants visit the site to examine learning programs; and the investigation leads to a meeting where all parties discuss the situation and try to arrive at a consensus about resolutions. The process is non-threatening and the emphasis on partnership and "working together" for the social good permeates the way the task is approached.

DENMARK

I. Elements of the System that Support a Quality Learning Program of Career Preparation

A. Reforms Affecting the Nature and Quality of Vocational Education.

Denmark is in the midst of a number of wide-ranging educational changes brought about by the 1991 reform act. In an effort to broaden the skills of workers and build greater flexibility into its system of occupational preparation, the vocational streams of study have been reduced from 300 to 87 and may be further reduced to 10 to 12 clusters in the near future. The trend is toward fewer, but broader streams leading to gradual specialization. The aim is to develop individuals with broader skills in order to ensure flexible workers. Work increasingly demands interdisciplinary skills, for example, a machinist needs to understand electronics. Employees are in demand whose training reflects a combination of skills, such as "automatic mechanical fitters", and who are qualified to install, repair and tool the machines.

To meet that demand, the Danes are working to develop new occupational courses and instructional strategies that are in line with production methods in high-performance work-places, the need for constantly improving customer service to maintain international competitiveness, and the use of new technology as part of the workplace production process and the delivery of education and training. Since it takes about five years from the formulation of a new training area until the first student is in training, it is important to develop faster approaches to bring these programs on line. These factors impact the traditional mode of training and create a greater role and higher expectations for school-based learning. According to one union official,

> *We have begun a process of merging the best elements of the old apprenticeship system and the new school-based learning system. The old Meister/pupil relationship of commitment and nurturing is the basis of the apprenticeship system. It's the people behind the system that matter. As we move in industry from a tailoristic way of working to more individual responsibility for work, we must merge the tradition of the crafts and put the means back into the system where workers can be creative and self-initiating. We must create learning situations for youth which allow them to organize their own learning and give them responsibility for the quality of the product.*

Although Danish industry willingly plays a pivotal role in employment preparation, the philosophy within the business community is that the trainee must pull his weight in production and should not be a cost to the firm. According to one company representative, "We try to give trainees a good education, but we must compete and make money. If we don't, we can't afford to have trainees." Achieving a balance between the needs of business and a vocational education system with in-firm training as a central design element, creates special challenges especially in times of high unemployment.

To ensure adequate numbers of training slots, incentives have been created to achieve greater employer participation and when placements cannot be found, special workshops and simulations have been developed. Still, ensuring the quality of programs whether in school or in workplaces is a continuing challenge. We found much introspection and discussion among the Danes over how best to fine tune their system and configure the many design elements they have put in place.

Overall, however, there appears to be great consensus that education is the mechanism to ensure job mobility and the real possibility for choices in future working life and in the individual's role in society. Education is also viewed as the mechanism to address the needs of the labor market and to provide the basis for further education. We were told that the type of education you create--whether narrow or broad--is a statement of the country's politics and policies for society. The structure of education with a broad focus represents a policy for the long term.

B. Governance: Collaboration Between the "Social Partners".

There are three levels of collaboration for overseeing vocational education and occupational competency standards. The Ministry of Education sets the overall framework and the standards for the general subjects, including the volume of school training, the resources to be committed and the specific trade or occupational areas to be covered. The Ministry determines the framework that affects the level of funds trade committees will commit for in-company training and the content of the vocational training in the schools. The Ministry is advised on these matters by the Council for Vocational Education which is composed of an equal number of senior representatives from management and labor organizations.

Whereas the Ministry sets the standards and parameters, the trade committees (represented by trade unions and associations of employers) determine the courses that meet these standards. The approximately 50 trade committees set standards within the vocational subjects for school and in-company training. They evaluate and accredit in-company training places. They decide on, implement and pay for the respective final trade test. It is through their certification schemes that individuals have access to the labor market. It should be noted that many of the members on the trade committee are also on the National Council for Vocational Education which advises the Ministry. From these bases of power, employers and unions exert much influence on the content of vocational instruction.

At the local level there are education committees. They are made up of labor and employers in the various trades. They advise the school and help in the development of the local plan for implementation of the administrative order. It was our impression that these local committees have more influence over the educational process than vocational education advisory committees in the United States or Sweden.

Quality is also built into the system through continuous assessment of the student, the school and industry training partners. Employer and trade associations must approve the trainee placement and training companies are constantly evaluated; firms go through an accrediting process to qualify as training firms. To ensure students have a variety of training experiences,

members of the trade committee representing both union and employer visit any new firm wanting to train a student. The accreditation is to ensure there is a breadth of in-training experiences available to the student; if not, the firm cannot be certified or the committee recommends that the firm contract with a third party to supplement the training. Efforts are underway to make this process more flexible to allow some companies to have part-time trainees, if they have the potential of meeting part of the overall training program. This is being done to create more training placement opportunities for students.

"The Secretariat's Procedures for Describing Professional Goals Initiated by a Professional Committee" (August 15, 1992, The Metal Industry's Apprenticeship Committee, The Secretariat.)

The document provides a description of parameters for company and school training programs for particular training program/specialist fields. These parameters include:

- The partial job or field of work defined by the parameters in question (e.g., CNC lathe).
- Information about the skills and knowledge base required as a basis for admittance to the training program (e.g., computer studies, cutting technology, mathematics, measuring technology, machine operation and physics, equivalent to the specialist content of previous school sessions).
- Relevant subjects--basic (e.g., English), area (e.g., operation of CNC lathe), specialist (e.g., programming of CNC lathe) and optional (e.g., tool measuring on CNC lathe).
- The estimated number of lessons for individual subjects.
- Special teaching equipment/recommended location (e.g., computer room with simulation equipment, CNC lathe.)

II. Content and Structure of the Learning Experience

A. Foundation for Higher Education: Compulsory School.

Danish youth receive a strong education foundation in the *folkeskolen*, during the compulsory school years, first through ninth grade. Denmark has an optional tenth year of compulsory school for those students who are not ready (for whatever reason) to move onto the next level. About 40 to 50 percent of youth take advantage of this tenth year with some young people spending this time in special boarding schools.

Students are generally kept together throughout their *folkeskole* years. They have a class teacher that guides them from grade one through nine maintaining close contact with parents.

Classes are small averaging 19 to 22 students. Teachers are trained in all subject areas, but tend to have at least two primary subject specialties. They also must be able to teach at each of the nine compulsory grades. Possessing these broader skills allows for greater flexibility of instruction. Beginning at about seventh grade, students go to a few optional classes and can choose between regular and advanced levels (e.g., regular or advanced physics). Under new reforms, however, these differences are being eliminated and all students will have access to the same level of content.

B. Upper Secondary Education.

The upper secondary system is free and voluntary. Ninety-three percent of youth continue into upper secondary education at about age 16 or 17. Here they branch into three different types of upper secondary schools (or colleges), each representative of about one-third of the remaining student cohort. Those options include the upper secondary schools of: commercial studies; technological studies; and general studies (or the gymnasium). The technical and commercial colleges combine general subjects and vocation-related practical training (in school-based workshops), and trade-related theoretical training.

Each program leads to either (a) leaving examinations which qualify students to seek admission into universities or colleges of higher education (for students attending full-time programs) or (b) an occupational certificate (for students pursuing the basic or practical training courses). The remaining seven percent of youth enter the labor market directly after the folkeskole and do not seek additional training (though they may do so eventually).

There are no special grade requirements to enter or continue through the vocational and technical college systems. The system is free and programs are generally open admission with the exception of occupational areas where there is an oversupply, such as cosmetology and photography. Similarly, there are no grade requirements to enter the general studies or gymnasium program, but students must be recommended by teachers regarding their ability to achieve in the course of study. Those recommended as "able" or "maybe able" are admitted. For others judged "not able", a test is required prior to admittance. (We were told that teachers at the compulsory school, in consultation with parents, generally make the final determination and that if the desire exists, there are few barriers to entering any of the upper secondary programs.)

Throughout the country there are some schools that are specialized by occupational areas. Youth normally attend local schools in the early stages of training and may go to a more specialized school as they progress in their training to cover particular aspects of the trade. Students from all over the country might be represented in these specialized courses.

C. Structure of the Vocational Learning Experience.

Within technical and commercial upper secondary education, young people can pursue several options based on their occupational readiness and interests. The programs run for three years (with individuals entering and completing programs between the ages of 16 and 21) and youth from the general studies program can transfer into the vocational training program at various

points. The programs are built upon a pattern of alternating school- and work-based learning. Typically the period of job placement will be for one to two years. However, the respective trade authority, and the individual sites determine the division of time between school and work based on the knowledge requirements in the field of study.

The sequences of courses move from broad to specific over the three-year period with the first year providing vocational training and basic knowledge applicable to a number of occupations, the second year providing more specificity applicable to a fewer number of similar occupations, and the third year offering courses of specialization for specific occupations. Regardless of the path chosen, the young people still maintain the option for continuing into higher education. The learning experience begins with a common year of basic vocational training that can be entered in one of two ways:

- ***Company Program First.***

Young people who have made a decision regarding their occupational area and desire a more hands-on approach and trainee wages may seek a company placement directly after compulsory school. They then spend their first 20 weeks in on-the-job training and the next 20 weeks in a technical or commercial college taking basic courses. For the next two years they have a sandwich schedule that alternates between training in the company and courses of specialized trade-specific studies in a school. For year two this usually amounts to two ten-week school sessions, and for year three, two five-week sessions. Once trainees have gained their occupational credentials, they may enter the regular workforce and/or enter technical and commercial further education/diploma courses.

- ***School Program First.***

Those who may need extra time for further occupational exploration, may enter one of the vocational colleges directly for a 20-week overview of various occupational program offerings prior to entering the second 20-week period of schooling for basic subjects. After this initial phase of exploration, they may enter into upper secondary education for a full-time upper second school program or if they receive a firm placement, into the sandwich training schedule described above. During the overview period, they receive guidance regarding the labor market and participate in workshops of different trades. Unfortunately, there is a fifteen to twenty percent drop-out rate for the first year school program. One union official explained this as a problem with putting such great emphasis on theoretical learning in the early stages of occupational training. Since most of the students who enter the apprenticeship system were not successful in regular academic classrooms, they are eager to work with their hands and they get restless if they have too much theory before they have hands-on experience.

Besides the learning environment, the primary difference for young people between beginning their training in the school program and beginning in a company program is that as soon as they secure a company contract they begin to earn a training wage. They receive this wage

during their in-school training as well--but only if they have the company contract. Youths who begin in the school-based program only qualify for a student allowance until he or she finds a company placement.

Most students upon completing one year of vocational training sign a contract with a company, receive a salary and enter into a sandwich program of alternating work- and school-based learning. It is the student's responsibility to find a placement with a firm. They are coached and given encouragement by the school. Firms call the school but the student must prepare to sell themselves to get a contract for on-the-job learning.

If, after four months, a student cannot secure a training contract, several options are available:

(1) Continue full-time school-based training in their chosen occupation field or enter another occupational stream.
(2) Enter company work simulations developed by some vocational colleges.
(3) Participate in short-term training in special company-school arrangements where students are placed for a short time in a company at the government's expense. This option is particularly useful in ensuring in-firm experience when there is low demand for apprentices because of poor economic conditions.

D. Content of Education and Training.

The training at technical colleges provides a combination of basic, area and specialist courses designed to give the trainee a strong theoretical and practical background. A great deal of emphasis is placed on helping students acquire a broad theoretical and technical knowledge base while specialization is gained through the workplace and specialty subjects. The school portion of the vocational training includes:

- **One third of time devoted to basic or foundation subjects.** General subjects include Danish, English, math, science, work orientation and computers. By law, the Ministry of Education determines the content for general subjects, but national trade committees decide which general subjects trainees will take as part of a particular vocational program.

- **One third of time devoted to area subjects related to a general trade or industry (e.g. electronics or welding, CNC controls) in more than one stream.** National trade committees have authority for determining these subjects.

- **One sixth of time in specialized subjects related to a specific trade or industry at highest vocational level (e.g., up to international standards).** National trade committees have authority for determining these subjects.

- **One sixth of time in optional subjects (practical and theoretical subjects (e.g., gymnastics, math in preparation for the exams).** Most students select general subjects that prepare them for higher education. In many instances trade committees strongly suggest certain optional courses that students should take. The authority for setting these courses comes from a variety of sources including the technical or commercial college, local education committee, Ministry of Education, etc.

E. *Case Study*: School-based Training in Denmark.

The *Handvaerkerskolen* in Sonderborg offered a very interesting model of school and worksite training and evaluation. During the first 20 weeks of basic vocational technical education, trainees receive guidance regarding their education program and future plans, participate in elective subjects/course subjects, and work on three different projects. The projects could be in similar or totally different industries. The student also chooses the level at which he or she wishes to work; the highest level has the least teacher support while the lowest level offers the most support. At the lowest level, students would be given all the materials and information needed to conduct the project; at the middle level, students are given the drawings and other supports; and at the highest level, students are given only the project or problem to solve. Students' projects are assessed on a 13-scale marking system based on standards for each level of difficulty in areas of practical and theoretical skills, independence, cooperation, creativity, quality, and work effort.

During the second six months, students pick a major area of concentration for more specialized study. They also begin to seek an employer sponsor. The student is solely responsible for finding a contract with an employer but teachers sometime assist them by providing employer contacts. The parents, school representative, and work-site mentor must sign the employment contract.

For the next three years, students alternate between school and work at their sponsoring company, each portion reinforcing theory and practice.

F. *Case Study*: Firm-based Training in Denmark.

Not withstanding the support and structure that unions and national frameworks provide, it was our impression that in-firm training varies based on the structure of the workplace and the resources and time available to the training commitment. Larger firms often have dedicated training departments and personnel and provide a fixed-sequence program of instruction, whereas in small firms production often determines what tasks apprentices undertake.

No matter the parameters of the workplace, in-firm training is driven primarily by the task at hand and the means of accomplishing the task. One team member noted that, "the learning process starts by having students see the completed end product and why it is as it is. The process then involves backing up and breaking the product into parts, figuring out how to make the parts, and then putting them together into a completely functioning whole." This team member also noted that, "Students are given the problem or performance task and then

set out to figure out how to solve or accomplish it on their own. Help is provided only as needed. In America, we pay much more attention to having students follow a prescribed set of procedures to complete a major task. In Europe, they allow students to develop their own creative set of procedures."

Individual firms handle apprenticeship training differently. The following observations illustrate two very different training programs

- ***A Small Firm Program.***

A small video reproduction company we visited has 50 employees and one apprentice. It is a very fast-paced, deadline-driven company. It does not advertise for apprentices but receives about 20 applications annually. To select candidates to interview, the company looks at the applicants' first year grades from the technical college--particularly in math and English--and their references from the folkeskole.

The current apprentice is in training as an electronics mechanic and services 1000's of VCRs of varying models on site to keep pace with customer demands. Within the company he has his own work area alongside other skilled workers. He has recently passed his final exam and will complete his apprenticeship with the company in the next few weeks. The company committed to keeping him employed until the spring, when he begins a year of military service. In seeking a company placement, the apprentice looked up companies in the telephone directory, called them, and he and his mother visited each firm that showed interest in him. His counselor at the technical college had also given him a list of potential employers in his area of interest.

According to the trainee, initially, he received an introduction to the company, but more recently has just been repairing machines. He has not had to adhere to a real training plan. In a small fast-moving business everyone reacts to the production schedule and the crises at hand. The tasks are varied and he gets experiences with many work-related problems. The apprentice also felt that the technical college exposed him to a wider range of electronic machines than were available at his worksite. The apprentice felt that he did not have enough time to work through theoretical and practical problems with his worksite mentor. They made time to talk as the apprentice prepared for the final exam, but it was usually done after work. The company's narrow focus on video reproduction has been something of a problem, though the apprentice felt he had sufficient exposure to other equipment in the technical college.

- ***A Large Firm Program.***

Den Danske Bank illustrated a very different approach to training and a very different level of resources devoted to in-firm training. The company has 13,000 employees, 500 branches and is the largest bank in Scandinavia. Apprenticeship with the company leads to a banking diploma that is comparable to the masters of business administration in the U.S. It takes about five years to complete the program, two or three of which are spent in-company training.

Of 2000 applicants annually, the company takes only 120 apprentices, most of whom are enrolled in the academically-strong commercial vocational schools In selecting trainees, the focus is on their school record, an interview, and the results of a test.

The in-firm part of training provides more specifics regarding the tasks of the occupation than the trainees get in the vocational school. The company spends about 25,000 kroners per apprentice for a two-year training program, plus salary. At the end of the program, trainees are given a three-day group essay and an oral exam on applications across seven training areas (including computer systems, loans and advances, international banking, and sales presentation techniques). Once the banking diploma is received, the individual can enter further education and training/refresher courses. Further training involves multiple cross-training in a number of areas.

G. Danish Assessment of Knowledge and Skills.

Evaluation is continuous throughout the school/work period by teacher and worksite mentor. The schools provide employers with an explanation and discussion of the students' progress, including strengths and shortcomings. Instructors in the vocational colleges may ask the company to focus on deficiencies while training in the company.

Additionally, the student maintains a log book that describes his program and areas of deficits. This log is passed on to the firm and can be used to structure the learning to complement the school work. In the larger firms, an individualized student instructional, documentation and assessment plan is developed for each trainee. This allows the firm to track closely the progress of the student.

There is also a great deal of emphasis on self-assessment. Students are encouraged to identify their strengths and weaknesses and to discuss them with teachers and mentors. They are also encouraged to discuss the strengths and weaknesses of their school or work experiences.

There are three phases of assessments that lead to the journeyman certificate:

(1) a certificate from the school stating that the student has passed all school periods successfully;
(2) a certificate from the company stating that the trainee has completed the in-company training; and
(3) a certificate from the trade committee stating that the trainee successfully passed the final trade exam.

The final exam for most occupations is established by the trade committees and generally requires that students complete a product or project. These products are evaluated by the school and by a representative from the workers and the company. In addition to producing a product, trainees are given either a written or oral exam, or both, by the trade committee.

A group of machine shop students shared their examination experiences with us. They had been evaluated by a team composed of company and union representatives. The team had

selected the examination from one of ten practical tests prepared by the National Trade Committee for Machinery.

Before sitting for the examination, the students spent five weeks in preparation at the school. During the five weeks, each student received a mark by the instructor. The mark determined whether or not the student was ready to sit for the exam. (On occasion, students deemed unready could be referred to another round of school-based learning.) It is evident that performance counts and the assessment systems get students' attention and put the teacher in control of the process.

The practical test may take up to seven days. The students were given one "help" day to think through what was required and to get started. They received a drawing with suggestions, but they could not help each other in carrying out the project. They were given up to 24 hours to do the milling work, another 24 hours for the lathe work, and another 8 hours to assemble the parts. Students may receive verbal advice from the instructor, but the instructor cannot do the machining. If the instructor helps the student set-up the machine, it is noted on the exam. The products produced by the student are graded by the external team.

If successful in the examination, the trainee then receives a journeyman certificate or certificate of mastery that is respected by industry and rewards the student for both academic and occupational success.

If the apprentice fails the final examination, the training firm is held responsible. By law, the firm must provide the apprentice with extra training at company expense until he/she passes. This law protects the trainee and puts real teeth into the training process. Students completing the training program with a journeyman certificate can receive unemployment pay if they cannot find a job.

H. Training of Trainers and Teacher Development.

- ***Worksite mentors.***

Denmark does not have a system of formal preparation for company trainers. The idea is to use the most experienced workers as trainers of students on the job. However, there is a big difference between large and small companies. At large companies, apprentices may be assigned to a professional Director of Training, whereas at small companies, trainees may be directly under the foreman of a particular department as they rotate among experienced workers.

A member of our team noted that the Danish reliance on extended learning in the workplace has its advantages. But among its disadvantages is that students often do not get the breadth of coverage in related technical materials they need. "Their system draws heavily on learning from existing workers and since some existing workers do not stay current with the changing technology and processes, students are often schooled in the old system of technology and not

the new." It is important that a system that relies heavily on learning in the workplace have a structure whereby workers (especially in training positions) are continuously updated on current technology.

- *Teachers.*

Vocational teachers are required to have a practical background. They are also required:

- to complete an upper-level secondary education and some further education;
- to have five years of successful working experience beyond the time they receive their journeyman certificate;
- to enroll in further education and to complete methodology courses in education within two years after they begin full-time employment.

Many of the teachers at the technical and business schools have not only finished a certificated program in public secondary school and work experience, but have received full university training. Teachers with university training are required to have only two years of work experience. Increasingly teachers who have both vocational and university training are becoming the backbone of the vocational and business school system.

III. Danish Strategies to Ensure Success and Motivation of all Youth

- **Guidance and counseling services.** Every folkeskole offers some form of guidance services provided by teachers who spend about half of their time in these activities (for pupils ages 14-16). After compulsory school (for ages 16-18), the educational guidance service follows all school leavers helping with placement into alternative and regular training programs as well as providing support to students in upper secondary vocational colleges. Each student gets about five hours of guidance per year for technical fields, less for commercial fields (three and a half to four working hours). There is also a public vocational guidance service for everyone from age 18 and above.

- **Students who enter upper secondary school receive the equivalent of approximately $550 a month.** The tuition is free, although students have to pay for their books. As a country, Denmark values education and their policies encourage youth not to take an unskilled job but to get themselves prepared for a skilled job.

- **The vocational schools use a contract system with students for the first half year.** The student and their parents, with the help of a school tutor, work out a statement of intent based on a review of the academic and vocational course list. Students are aided in selecting the general course that will support their choice of vocational subject.

- **Choice and incentives to tackle more challenging work are imbedded in many instructional activities.** Vocational instruction is organized around products and projects. Students design the products and projects and make them to specified standards. The students choose a project or a product and select one of three levels of difficulty and autonomy on which they will work. They receive guidance in selecting their level and may in time complete all levels of a project. Those students who really want to go on to further education strive to do level three work. Students work in groups on projects.

- **On-the-job expectations are clear and trainees are helped as needed to meet them.** Company expectations are described in detail in the framework of agreement that exists between the company and the trainee. Thus, a mutual deal is struck between the company and the trainee. According to one manager, "We hold trainees to high standards in this company; we push them into deep water to challenge them, but we are always there to give them a helping hand if they need it. The process builds confidence, and motivates students to do their best".

- **Students are given a series of clear, major milestone events that require hard work and individual effort to accomplish.** The system is designed so that if students make the effort, they do not fail. Consequently, students take a great deal of pride in their abilities and accomplishments.

- **Students who do not receive a work-based learning contract receive short-term worksite learning.** These students are not paid by the company but by the government. When the demand does not exist for apprenticeship because of an economic recession the government tries to find ways to place students in worksite learning experiences. We were told that 90 percent of graduates are employed in jobs within their occupational areas three months after receiving their credentials. (This figure may be lower now given the present unemployment level, however, we were assured that these youth are popular and are highly sought after.)

- **The state has developed innovative alternatives through the vocational schools for students who have managed to fall through the cracks, who formally opt out of the system for a while or who need a job change.** Our study team observed one such alternative which simulated an office working environment drawn to the last detail including a time clock. There are also extensive counseling and youth services available for students under age 19.

- **All citizens in Denmark through age 19 are tracked relentlessly and encouraged repeatedly to enter a training program.** Unskilled workers are considered to be a bane on society so everyone is encouraged to be trained and retrained. The state assists this process by paying trainees up to $500 per month for training. This is in addition to a free school system.

GERMANY

I. Elements of the System that Support a Quality Learning Program of Career Preparation

A. Integration of Theoretical and Practical Training.

In our quest to determine how the Germans integrate academic and occupational learning, we ran into some difficulty since in many instances these domains are inseparable, and in others the Germans use them in a reinforcing, and not necessarily integrating manner. For example, in the United States, we have sought ways to integrate vocational content into core subjects of English, math, science, and social studies and to strengthen core course content in vocational subjects. In Germany, curriculum and content in the schools that support the apprenticeship path are divided into: (a) general education courses such as economics and other social sciences and (b) job-related courses, both theoretical and practical. Depending on the occupational area, these job-related courses might include math, science, communications, accounting, data processing, etc. Both theoretical and practical courses are taught by the vocational teacher, or perhaps by a pair of teachers who coordinate the instruction.

Integration also appears to be a structural feature of the system since authorities responsible for in-firm learning and those responsible for school-based learning must agree on the general framework of the curriculum. In reality, however, neither site is the sole purview of that particular type of knowledge and there is great overlap across the domains. Firms have (a) classrooms where they impart theoretical knowledge, (b) workshops that provide introduction to practice as well as confirmation of and introduction to theoretical knowledge, and (c) production sites. Schools not only serve as reservoirs of theory, but also provide workshop experiences, and serve as sites for cognitive apprenticeships. Knowledge is recycled and reinforced as the trainees travel from the school to the worksite and back again.

B. Governance: Coordination and Monitoring at Multiple Levels.

The German Federal Institute for Vocational Training (BiBB) models an institutional arrangement that generates research and development activities carried out with cooperation of the social partners, that is, employers and employees (as represented by their respective organizations), to promote policy and program development. The Institute works on a consensus basis over a six-month period with the employers and unions to decide research topics. They also write reports for the *Bundestag* (Parliament). The research questions relate to practical policy implications. Firms have a stake in the choice and results of model research, as they fund 25 percent, while the government funds 75 percent. Part of the research may be subcontracted to university researchers. While conferences provide forums for presentation of findings, research results are disseminated in accessible media, such as newsletters, films and computer programs, as well as reports. The BiBB facilitates the dialogue on standards and the social partners achieve formal agreements about standards that are issued as ministerial orders.

At the regional and local level, the Chambers appear to be at the hub of communication between schools and teachers and between the business community and its training resources. Their market-driven upgrade courses are derived from industry, union, and Meister/trainer needs. They continually research needs and react with appropriate responses in a timely manner. These various elements continue to keep the stakeholders in contact and maintain connections between vocational education and the labor market of the region.

Written vocational school reports of student progress are shared with the employer/Meister and the school provides a liaison who visits the training site to confer about the apprentice. Additionally, the employer/Meister may confer with the school about areas of knowledge/skill where the apprentice may need additional instruction. Some Meisters routinely discuss trainee progress with the vocational school and the parents.

C. The Role of the Meister and Trainer.

At the center of the system is the Meister or trainer. Much of the quality of the training experience and the day-to-day program of study rests with this individual, although schools and training centers augment the quality of the in-firm experiences. Trainers or Meisters who fail to keep their skills up-to-date will cause their firms and apprentices to fall behind on cutting-edge knowledge.

In small and medium-sized businesses, it is the Meister (master trades person) or firm owner who is responsible for ensuring that the trainee acquires the competencies required to pass the final exam. In contrast, large firms often have specially prepared career trainers who instruct in-firm workshops and are not involved in production. These trainers will have an average of 16 trainees.

> *"Technical developments have meant that training contents, particularly in the field of industrial training, have become increasingly complex; so much so, in fact, that in training for a large number of occupations, specific training contents, especially what are known as the basic skills, have to be imparted independent of production, in separate training courses. For this purpose, medium and large-scale enterprises have installed special training workshops. For those firms that are too small to operate their own facilities, training workshops above single-firm level have been established by the Chambers and by professional associations. However, such activities are no substitute for, but only a supplement to, training on the job, as they cannot provide the . . . advantages of in-plant training: they can at best provide only a simulation of practical work."* (p. 8, 1988, Deutscher Industrie und Handelstag. 1988. **Duale Berufsausbildung in der Bundesrepublik Deutschland.** Bonn.)

The work of trainees is evaluated at short intervals with the aid of criteria developed by the firm over a number of years. Trainers and firm management draw up the training plan, and determine how many trainees are to be recruited and in which occupations. Following training in the workshop (or general orientation in small firms), trainees are supervised on the production floor. Trainees are taught to solve problems, function as team members, and work

independently. Typically, they spend time in each department and work with a variety of skilled workers. Skilled workers may be involved in training and may be delegated responsibility for a specific part of training.

Although specific aspects of in-firm training may be delegated to certain employees, the firm owner has sole responsibility for ensuring that training is carried out in keeping with the dictates of the Vocational Training Act of 1969, or must commission a suitable person (e.g., a master crafts person) to carry out this task. Firms must register the responsible trainer with the Chambers. The responsible trainer works to draw up a training plan for the apprentice to ensure that skills required by the training ordinance are taught. All training thereafter must conform to that training plan.

The firm and Meister or trainer take the training process very seriously, with great interest in the apprentice both professionally and personally. As a result, the Meister or trainer is also involved in providing career and personal counseling to the trainee.

The team visited a small, family owned and operated company in the outskirts of Nuremberg, the Kramer Machine Tool firm, and found that it had the latest in CNC lathes, milling machines and CADD-CAM. The company had two apprenticeships, although it had served four prior to the current recession. Because the plant had state-of-the-art equipment, the Meisters were continually upgrading their skills to remain effective in their jobs.

II. Content and Structure of the Learning Experience

A. The German Dual System.

After nine years of full-time compulsory education (ten years in four of the *Länder*), a young person may select one or any combination of the following pathways:

- A three-year academic program in preparation for university.
- A one- or two-year full-time vocational program in preparation for work or further study.
- The dual system composed of (a) part-time compulsory vocational education which includes basic academic courses, (b) on-the-job training for a three- or four-year period, and results in an occupational credential.

Dual system training is provided only in state-recognized skilled occupations. In-school vocational education provides the theoretical and technical training to complement the in-firm training. Each trainee must attend a state-run vocational school for eight to twelve hours of instruction per week. The focus of instruction (about 60 percent) is centered on the basic

technical knowledge required of the particular apprentice occupation. The remaining instruction time (about 40 percent) is spent in general or basic education courses. Throughout Germany, part-time vocational schools specialize in the following areas:

- administration and economics;
- technology (e.g. metalworking, electronics, construction, textiles);
- social professions (e.g. baking, hair dressing, child care); and
- agriculture (e.g., landscaping, forestry, horticulture).

The number of in-school weeks is defined by the apprenticeship contract and may only be changed by agreement of the parties to the contract.

Individuals older than 21 can attend vocational schools on a part-time basis with two-thirds of the cost supplied by the *Land* and one-third by the student. If a youth in the dual system must travel away from home to attend a vocational school in his or her occupational area, the firm pays for the student's accommodations.

A committee of the representatives of the Standing Conference of Ministers of Education and Cultural Affairs of the *Länder* (KMK) and the federal ministry draw up curricula for specific occupations. The responsible federal minister issues **training regulations** specifying the name of the trainee occupation, the period of training, and the abilities and knowledge to be imparted in the course of training. To assist employers, these regulations include guidelines for the systemic presentation of the syllabus and the timetable for training. (pp. 6-7, Deutscher Industrie und Handelstag. 1988. **Duale Berufsausbildung in der Bundesrepublik Deutschland.** Bonn.)

B. Role of Guidance Counseling and Placement.

According to the Employment Promotion Act, the *Bundesanstalt für Arbeit* (BA) or Federal Institute of Labor, is the sole provider of vocational guidance. Since vocational guidance cannot create apprenticeship opportunities, a joint effort with industry, including massive public relations, has increased the number of training placements available in the former East German Republic by 30 percent. For example, in one year, guidance officers in the former East Germany made 100,000 visits to encourage companies to offer youth training places.

The BA is structured to accompany the individual from the start of their work experience through to retirement. It conducts labor market and vocational research and maintains labor market statistics. It is involved in:

- job search and placement;
- vocational guidance and placement;
- the promotion of vocational training, retraining and rehabilitation, including special efforts targeting the hard-to-place (e.g., foreign apprentices and the disabled); and
- measures to: (a) create and maintain jobs, (b) sustain workers during periods of wage-disruption, unemployment, and the start of new or self-employment,

(c) to surmount the economic impediments to obtaining an initial or further vocational credential; and (d) to improve the employment structure in individual sectors of the economy.

Vocational guidance begins in the last two school years of compulsory education when guidance representatives from the BA go into schools and talk about career choices. They try to help students make informed career decisions instead of simply responding to family and peer pressure. Students also utilize materials (videos, publications) in the vocational information centers in local areas and make appointments for individual meetings with BA guidance counselors. Parents often accompany students in these informational meetings.

If the student is still undecided on a course of training, he or she may visit a company for a "getting to know" period of one to four weeks. All materials provided in the course of counseling are developed in concert with employers and employees to determine accurate representation of the occupation field and to ensure neutrality of presentation.

Students also have a "work studies" course while in compulsory school. This course is taught by regular school teachers. Its content is determined by the *Land* but generally includes information on how the economy works; the purpose and functions of trade associations; social security and other benefits; and how companies function. The BA provides publications that teachers can use and takes part in teacher training efforts.

It is the policy of the BA to give only guidance based on student interests and areas of greatest occupational opportunity and demand. The BA ignores the pressures of special interest groups to channel young people into a given profession. It is important that young people are provided the best initial information to ensure an optimum match in the selection of a training occupation because apprenticeship training is expensive. Dropouts and false starts cost the system and need to be minimized.

Good investment in the training of guidance officers is essential to this process. Guidance officers complete a three-year training program plus a practicum in the BA's own academy. Guidance officers who provide counseling at universities must have one year of training plus a university degree. Those that work with the handicapped have an extra one-half year of training.

C. Structure of the Vocational Learning Experience.

The vocational school provides instruction in the theoretical aspects of the occupation which complements the applied skills that youth are taught within firms, and general education in basic subjects. The "theoretical aspects" vary widely but represent a combination of classroom and workshop classes depending on the appropriate presentation and practice of the skills being developed. General education subjects include political or social studies, religious education, and languages. Students do not receive math or science per se, but rather these courses are built into the theoretical aspects of the technical curriculum.

Projects are encouraged and are designed to develop team-building, independent learning and problem-solving skills. Ideally, they should successfully combine both theoretical and practical skills in a didactic unity. The key is to have teachers work together and try to combine subjects, so that students are presented with a unified body of information and skills. We were told, however, that the problem with integration in the curriculum is that there is a great deal of theoretical knowledge that must be present and assessed. Often in the context of projects, some of this knowledge is not made obvious.

We observed one lab which had sophisticated computer applications in electrical engineering and applied physics. The engineering lab instructor was an engineer with full university and skilled-worker credentials, in addition to combined knowledge of engineering and pedagogical training. The programming and testing equipment, recently installed, permitted students to progress through a sequential list of increasingly complex tasks. Trainees worked in teams (two to a computer) and the maximum class size was 16. This was a 90-minute class provided for 12 weeks, separated by blocks of 2 to 3 weeks spent in the respective firms.

Computers were evident in many classrooms. Metalworking students were using modern technology, including computer-aided manufacturing. Students were working with computer software used for manufacturing processes and were learning to produce a product using the program. Students had received general computer training in compulsory school. In vocational school they learned about specific software programs. Students who enter courses with computers were expected to have the required math foundation. They do not receive separate instruction in math other than what they received as part of their technical classes.

Dual System Student Schedule. Trainees' schedules vary in keeping with the dictates of their occupational courses of study. Typical schedules are:

- **Attend school one day per week and go to training firms the remainder of the time or have block scheduling of school and firm time.** One day of vocational school equals roughly nine, 45-minute class periods per day and a block week equals 37 hours.

- **Attend school two times a week for two years and only one time per week in the last year of the apprenticeship.** This model generally applies to vocations for which the content and regulations are fairly recent, e.g. electrical or mechanical engineering that rely on the introduction of new technology.

- **Attend school full-time for one year (the equivalent of one year of apprenticeship training) and then one day per week for the next two years in school.** This pattern applies to the basic vocational school year and also generally applies to occupations such as woodworking technology, home economics and agriculture. This model was developed to address the needs of the baby boom era when there were more young people than training slots in firms. The model has persisted in some professions and disappeared in others. Also, the government stipulates which occupations must use full-time vocational training.

For example, in the case of woodworking technology, the tradition is to teach the basics in school first to ensure a sound foundation, and to follow with the specialized curriculum. Many crafts people are very satisfied with this model--especially small companies that do not have time to divert production time to training. For the young person, this structure is less ideal because they are legally classified as a full-time student during that basic year and do not earn a training wage like most apprentices in the dual system. This model makes some occupations unpopular as a result.

- *Case Study:* **Apprenticeship Training in a Large Multi-National Corporation.**

The Diehl Corporation, with 15,000 employees and 3 billion DM in sales, is one of the 100 largest industrial companies in Germany. Its eight divisions include: non-ferrous metal; brass products production; controls; industrial equipment; aeronautical systems; watches and radio-controlled clocks; machine tools; and ammunition systems. Its headquarters are in Nuremberg and there are 14 facilities in Germany and other locations in Europe, North America, South America and Singapore.

The company has 700 apprentices in 30 professions in three and a half-year training courses. About half are *Hauptschule* graduates; and the remainder are *Gymnasium* graduates. There is a training center in each of their 14 plants. The company trains only the number of apprentices the individual plants need and are willing to support, based on their planning forecasts. As a result, the company is generally able to offer employment to all trainees that successfully complete the program.

The recruitment and selection processes. The recruitment process includes advertising in the newspapers, open houses, and referrals from the BA's employment agency. The company looks at grades, the type of school attended, social background, proximity of their home and report cards (especially reports of behavior and deportment.) Children of employees receive admission preference. We were told that grades are not as important as teacher comments and a general impression of the applicant's personality and ability to work in groups and be a team player. The focus is on youth that can integrate successfully into the group work of the organization. Only one out of every eight applicants is accepted.

Tests are administered to the applicants, but only when they are borderline and there is doubt about their suitability. For applicants to technical vocations this includes a three-part test of intelligence, cognitive ability to deal with technical material, and manual skills. The cognitive test is multiple choice. The intelligence test requires identification of opposites and antonyms. The practical test presents spacial visualization problems, manual dexterity, and application of scientific technology. The results of the three tests are profiled and compared to an employee company standard profile. The tests in the commercial areas include measures of cognitive skills.

Structure of training. In the training center, apprentices spend the first year in a workshop covering basic knowledge of the field. Trainees also attend the local vocational school for two

days each week. As an example, metalworking apprentices receive an overview of all areas of their field, including the related basic knowledge in related subjects such as math. Thereafter they are sent to other departments and plants and exposed to a range of competencies and skills applicable in these areas. The trainees then come back to the training center for specialized training, such as advanced technology in CNC or CAD and CAM. In a given workshop, you may have trainees from various class years working on different projects and skill areas.

In the apprenticeship for specialized electronics, trainees receive general vocational training in electronics during the first year. The next half-year represents a common period of specialization for trainees. By the beginning of the second year, the curriculum begins to branch off by occupation for trainees pursuing different specializations. One branch may accommodate fitters for electronic machines, energy specialists for electronic power plants, operational technologists, and industrial electronic specialists. Trainees preparing for occupations in telecommunications will take another branch. Within each of these areas, further specialization is possible. For example, within telecommunications, trainees can prepare for radio or information technology.

After the first year, apprentices go into one of five local plants for a year and a half to learn within a production environment. They rotate through all activities related to their particular occupation within the plant. After three and one-half years they sit for the exam and if successful, become regular employees.

After three years of employment as journeymen, employees are reassessed. Some are encouraged to continue for further training. The company may even help sponsor their further training. Communications are maintained with the plant via special mailings and they are eventually recruited back to the management training program. About one-third return to the company.

The company also hires university graduates from business and technical universities. They begin as trainees for one year before moving into regular jobs in the company. About 10 percent of staff have a higher graduation credential.

The management trainee system extends to all the professional areas within companies. Therefore all apprenticeship graduates can aspire to the highest levels of company leadership.

The training center is also used to help employees prepare for higher and other professional qualifications. This is even done for those who are to be laid off. The company receives money from the BA to help avoid a dismissal and to train employees in other qualification areas. When dismissals are made, however, the company must provide a redundancy payment. More than half of the employees in the defense department have been dismissed recently.

Program attrition. By law, it is difficult to dismiss trainees during the training period. Generally, there is about a 5 percent dropout rate in industrial areas; about 7 percent in commercial areas; about 15 percent in the trades, with some trades having as high as 50 percent dropout rates. There is very low dropout from the Diehl program because of the

competitive admission process and because many trainees come from families of workers. As a result, trainees are well-motivated and have the support of their families.

We asked about conditions that ensure success for trainees or that precipitate dropping out. We were told that high attrition rates are often due to the structure of the company, especially in the smaller companies where the training program revolves totally around production. At Diehl, every apprentice is supported at every level of instruction--in workshops and in production--and the result is little attrition. Additionally, the company supports the ongoing training of managers not only in technical areas, but also in areas of employee motivation and support. Finally, the works council--not the union, but representatives of workers--has the task of supervising the training and the right to offer suggestions for training. There are two safety checks for supervising the quality of the in-firm training: (1) the works council; and (2) the Chamber.

- ***Case Study*: Apprenticeship in a Small Firm.**

Notter Haustechnik Gmbh is in the heating, ventilating and plumbing design and service business. It retains trainees in these areas as well as in office administration. The firm is a member of the *Handwerkskammer Koblenz*. This a family-owned firm founded in 1914. Mr. Karl Heinrich Notter, the present owner, began his training in the dual system and studied electrical engineering in Hamburg. He then joined his father's firm and built it to its current staff of 70. He normally takes on five or six new trainees every year.

The firm has a strong commitment to training. According to Notter, "It's very important that the firm trains young people. It is the only way to get quality persons." He indicated that all the Meisters currently in the firm's planning and design department were initially trained in the firm. Also, after 10 years, 25 to 30 percent of his apprentices are still with the firm.

Selection of Trainees. The firm owner relies on his connections to the Chamber and uses the labor office for finding apprentices. Additionally, he may place advertisements in the newspaper. Generally, there is a lot of interest in his company. Most applicants are graduates of the *Hauptschule* (80 percent), but some are from the *Realschule* (10 percent) and the *Gymnasium* (10 percent). He tends to hire the ones from the *Hauptschule*, indicating that he wants to give these young people a chance for a good livelihood and also because they tend to stay longer with the firm. After passing their exams, he offers each trainee a position because he knows they are tested. He has watched them grow up in the company and knows their readiness for the experience ahead.

What makes for a successful in-firm learning experience? In response to our question, Mr. Notter laid out the following four factors:

- ***A good preparation in compulsory school.*** The school system is changing and many young people who would have traditionally attended the *Hauptschule* are attending the *Realschule* or *Gymnasium*. Those attending the *Hauptschule* increasingly come from "weak" families and are therefore often problem apprentices. Many need special pedagogical help, especially those studying in the metalworking area. He indicated

that it is important to have small classes in the *Hauptshule*, from 30 down to 15, especially in the last years. He added that the profession is very technical and therefore the syllabus in the vocational school is very demanding. Special efforts must be made to ensure that students are prepared for the demands of the workplace.

- ***A good selection process.*** He reviews the applicants' school report looking for a good scholar. He also looks at the family. Normally he interviews the parents for about an hour and shares information about the firm including opportunities for career development and advancement, as well as the economic outlook in the firm. He feels that it is important that parents are willing to help and support the youth through to the end of the training period. He added, "It's a new experience for the young person and parents must guard against their dropping out. Trainees are about 16 years old. This is a very difficult time for them physically and emotionally. It is important to get them through this into adulthood."

- ***Continuous monitoring and contact with parents.*** He remains in continuous contact with the parents throughout the apprenticeship. Also he views the trainees' progress notes from the vocational school each year and often follows up with conversations with the parents and teachers. As firm owner, he has overall responsibility for all apprentices; however, the Meisters have responsibility for their practical training.

- ***Opportunities for a range of experiences in related areas.*** Initially, the trainees go through a rotation in the three main trades represented in the firm--electronics, central heating/cooling and plumbing--before specializing in one. The company has developed these three service specialties. This capacity is part of its marketing strategy to increase the company's competitiveness and flexibility in serving the needs of customers.

  Notter shared his philosophy of the value of mastering related skill areas: "All workers must know their profession well, but must also look to the right and the left of the profession." He indicated that about 30 percent of his employees have completed two apprenticeships, and therefore can offer a greater range of services to the customer. As a result, they make from five to ten percent more in wages than employees without this expanded range of skills. This also allows him greater freedom in scheduling employees for specific contracts.

D. Role of the Chambers and Training Centers.

The *Handwerkskammers* are regional Chambers for the Skilled Crafts of Small and Medium-Sized Enterprises. Their member businesses encompass 127 trades and their management includes the national trade unions. The *Handelskammers* are Chambers of Commerce and Industry and they represent large businesses and industries. However, these two organizations have overlapping membership and a similar role in the dual system. Nationally there are about 56 Crafts Chambers and 80 to 90 Chambers of Commerce and Industry. All Chambers function as self-governing bodies and work to address the changing job requirements and skill level of their respective workforces. Only about 10 percent of firms represented by the

Chambers of Commerce and Industry provide training. In the crafts sector, however, about 40 percent of firms participate in training. (Deutscher Industrie and Handelstag, **Duale Berufsausbildung in der Bundesrepublik Deutschland.** 1988.)

In Germany, half of all youth trainees in the dual system are in placements in firms of less than 50 employees; therefore, small and medium enterprises are major participants in the education and training of German youth. It is in the best interests of these businesses to have access to the latest technology and innovations if they are to remain competitive and ensure their future. These businesses look to their Chambers for help in maintaining their competitive edge in technology and personnel resources.

For its constituents, the *Handwerkskammer* provides:

- Economic and legal advice.
- Support for in-firm training activities and monitoring of member training firms.
- Criteria determining the qualifications of firms for training, such as the level of facilities and the suitability of production capacities, services and staff qualification for the prescribed training program. It also provides support to training firms on the structure, content and training aids of the program. Additionally, the Chambers keep a register of all vocational training contracts. Specialized training counselors on the staff of the Chambers attend to the particular training activities of member firms.
- Initial vocational training in the Chamber-sponsored, inter-firm training centers to supplement Germany's dual system of youth preparation of skilled workers. Training centers are important components of quality control and innovation not just for the German dual system, but also in creating and maintaining a competitive edge for German businesses. In addition to the one or one and one-half days youth spend in a vocational school obtaining theoretical knowledge and continuing their basic education, part of the on-the-job training component includes attending inter-firm training centers. Here, young people are provided basic and specialist training to ensure comprehensive knowledge and experience of the occupational area.
- Further training for skilled workers.
- Boards of examiners to hold interim and final examinations for trainees.
- Technology transfer from science and research to application in firms.
- Model and research projects involving the interface of science, research, technology and their applications.

- Information to teachers about vocational and further training and opportunities in the trade.

All firms in the regional area pay fees to the Chamber whether or not they have apprentices or use its services. A rough breakdown of the Handwerkskammer's budget was described as follows: 40 percent from the firms; 40 percent from continuing education and fee-for-service work; and 20 percent from the Federal Ministry of Education and the *Land* Ministry of Economy, for capital and equipment costs.

- ***Observations at a training center.***

The Metal and Technology Center (METZ) of the *Handwerkskammer Koblenz* is one of the most modern vocational training institutions in Europe. It offers training in 20 metalworking vocations, including information on the most current technologies in the field. Its facilities include 30 workshops which accommodate up to 450 placements for practical training, and 12 classrooms for instruction in theoretical aspects of the trade accommodating 350 trainees.

To stay abreast of new technology advancements as well as the needs in the field, the METZ maintains continuous dialogue with public ministries, scientific institutes, colleges and universities, industry and their small and medium-sized enterprises. It conducts a number of research projects in areas such as laser technology in the handicrafts, environmental counseling and protection, use of computer aided design (CAD) systems on small computers and expansion to CAM and PPS. The METZ also provides courses leading to the master craftsman's diploma. Opportunities are available for part-time and full-time preparation schemes.

- ***Activities involving apprentices.***

About 6,000 apprentices participate annually in inter-firm training at the METZ . The time spent at the training center is part of the in-firm training program and in no way interferes with the trainees' obligation to attend a vocational school. Time spent at the training center is usually spent in blocks from one to four weeks. These blocks are coordinated with the vocational school schedule.

In addition to initial and further training, the center provides services involving updating skills of foreign skilled workers, training for dislocated homemakers, special support for disadvantaged youth, such as early school leavers, retraining of the unemployed referred from the labor office, and special courses for instructors from other training centers. Additionally, the center hosts teachers from the local *Hauptschule*, *Gymnasium* and vocational schools to keep them knowledgeable about the various trades. The Chamber also has a program of scholarships for further education which are available to outstanding apprenticeship graduates.

The training center also holds classes for "special students". These students, characterized as "slow learners" or "learning disabled", spend what would normally be their first year of apprenticeship in the center with the goal of placement in firms in their second and third years. This effort is supported by the labor office through a competitive contract with the METZ.

We were especially struck by the modern, high-quality equipment of the METZ--everything in the center is set to industry standards and in some cases exceeds these standards. Some of the equipment was on loan or had been donated by manufacturers, as a way of introducing Meisters and students of the trade to particular state of the art equipment. In addition to the high-quality equipment (including many computer applications within the trades) classes were small with between 12 and 16 students. Where computers were used, there were one to two trainees to a station.

The machine tool training lab had some CNC machine tool equipment that had been built and installed only weeks before our visit. A representative of the center explained that the current set of equipment in the lab was the third generation of equipment since the center was opened in 1986. He further remarked that local industry looked to the centers for leadership and would not use them for up-date training unless they had the latest equipment.

The Study Team's tour of the facility revealed a welding center with laser cutting equipment, CNC cutting equipment and high-quality testing equipment, as well as a superb shop environment. The team observed an auto shop that had the latest engine analyzers and four-wheel alignment machinery. The electronics lab had professionally-built trainers for instruction in motor controls. One lab, which featured instrumentation training, was so new that the instructor was still working the bugs out of a computer program designed for the courses.

E. Assessment of Knowledge and Skills.

Three major elements of quality control for the dual system are federal regulation of occupational content, a national syllabus and the final exam. Guidelines tell what a skilled worker should know and be able to do without guidance at the end of the preparation period. These outcomes are determined based on the research on the expectations and requirements of the actual workplace. If the employers and unions agree on what these outcomes are to be, they become the training standards for that particular profession. In this manner, standards are established for common content and expectations across the country. The training syllabi and final exams are updated periodically in keeping with best practices in the occupational areas.

Knowledge and skills are assessed ultimately by passage of the apprenticeship examination. Examining boards, composed of equal numbers of employer and employee representatives and at least one vocational school teacher, hold interim and final examinations of trainees. Although the abilities to be examined are specified in the training regulations, the Vocational Training Committee of the Chamber determines the conditions of the examination, such as admission, form and duration, criteria for marking, the issue of certificates, and the rules for repeating the examination. Depending on the occupation, the exam may include a test of practical and/or theoretical skills.

A heating apprentice, for instance, may be required to blueprint and construct a number of joints for a heating system as part of the exam. The demonstration blueprints and joints are then examined and rated by the examination committee. For the written part of the

examination, an increasing number of occupations make use of uniform questions throughout the country; however, for some occupations, the Chambers determine the questions used.

Continuous progress during the training period involves a journal or "log" of skills acquired. The journal is prepared by the apprentice and the Meister signs off as each skill is acquired. It becomes a part of the assessment process when it is displayed at exam time, along with the demonstration of skill-related problem solving, by the apprentice. The log is also a form of accountability--proof the trainee has mastered the requisite skills, and proof that the Meister or trainer has observed them. Apprentices are often given extensive review periods to prepare for the exams and there is a high success rate. Those who do not pass are given additional opportunities to prepare and retake the exam.

Current debates center on reconstructing curricular plans and final tests into modules, and opening the possibility of testing at the end of each module along the way rather than only at the end. Behind this debate is the assumption that more at-risk youth would be motivated to higher-level performance if shorter testing periods were possible.

F. Training of Trainers and Teacher Development.

- ***Worksite Trainers.***

Nationally, there are about 800,000 in-firm trainers. About half are Meisters, and the remainder have taken alternate routes to qualification. This includes at least five years experience as a skilled worker with an appropriate vocational credential and the successful completion of all parts of a four-part exam that addresses:

- legal issues;
- general knowledge of youth;
- teaching ability (written, oral and practical); and
- technical knowledge.

The alternate training route was created in response to the demand for qualified trainers. It requires a candidate to be at least 24 years of age and to have successfully completed an examination developed by the BMBW. The examination measures (a) occupational skills in at least a "corresponding" occupation as determined by the Chamber, (b) legal issues affecting the profession and (c) pedagogical knowledge. Courses are offered by the Chambers for individuals wishing to prepare for the exam.

By either route, technical aptitude is not enough. It must be accompanied by an enthusiasm and commitment for the training and development of young people. Training in small or medium enterprises that relies on Meisters is generally thought of as having higher quality training than large industry that does not.

- ***Teachers.***

Teachers are civil servants and in Germany are accorded a high social status. The preparation of vocational teacher training varies by the *Länder*. Usually the process includes:

- successful completion of a university (or equivalent institution examination) exam degree in a content area;
- 12-18 months period of practical training; and
- 1-2 years in post secondary training for teaching methodology.

Normally, vocational teachers work a 24-hour week and are qualified to teach in at least two areas of content. Some teachers serve as liaisons between the school and the firm.

III. Challenges for the German Vocational System

The German system of employment preparation is characterized by a number of course corrections and efforts to effect changes in line with evolving external and internal pressures. Among the external pressures is the need to respond to rising international competition and to move toward more high-performance workplaces. The reunification of Germany has also caused a rethinking of the dual system and how to transpose it into the eastern part of the country along with a new social and political system. Finally, there are a number of internal pressures impacting the dual system which are being pushed along by an increasing desire for young people to attain a university education at the expense of the dual system.

- ***Response to International Competition.***

In the mid 1980s, the Germans realized that Japan had reached, and in some instances surpassed, the quality level of German products and were producing goods more efficiently and more economically. The German response included developing training centers, revising the number and types of apprenticeships offered, creating new apprenticeships to reflect technological advances, and reducing the number of occupational streams to 375. Additionally, many of the syllabi were changed to reflect current and future standards. The training centers feature well-educated trainers, state of the art equipment and innovative training equipment. They serve as a critical third leg in a vocational system based on in-firm, school- and intra-firm or center training.

- ***Overspecialization, the need to increase the level of basic education and better connections between dual system and university pathways.***

Among the challenges, the dual system faces is the restraints of overspecialization. Like most countries, the German economy continues to require more workers who have flexible skills and can continue to learn and change with the evolving demands of the workplace. A representative of the Federal Ministry of Education and Science said, "What industry needs is creative, cosmopolitan thinkers, not just people with high technical skills in one particular area."

Traditionally, university training has resulted in better-paying jobs than for those educated in the dual system. Up to 10 to 15 years ago, university graduates held senior-level jobs in firms. Now they are increasingly taking middle-level jobs previously held by graduates of the dual system who in turn are now being pushed out. As a result, a greater number of youth want to enter university education, and we were told that, "Industry is fearful of the demise of the well-skilled German worker." Increasingly, policy concerns focus on ways to allow graduates of the dual system to enter the university and/or to elevate dual system training to a university equivalent. The hope is that these options would encourage youth to stay within the dual system once they have embarked in this direction.

Another concern facing the dual system is the trend toward "lean production". The move away from bloated organizations and toward a more flexible and cross-trained workforce has impacted the number of training places firms make available as well as the type of skills workers bring to the restructured workplace. New methods of production and training are being actively discussed in areas such as team work, broad thinking, improved communication skills and a greater focus on projects and problem solving.

- ***Problems of unemployment and providing training for all.***

German policies and structures support an active labor market policy designed not to react to changes in the labor market or just to finance unemployment, but to avert employment, get individuals into jobs, retrain workers as the need arises and prepare youth for jobs in areas of demand. Without these measures, some speculate that the present unemployment rate (the highest since World War II) would have been one million people greater.

One of the greatest challenges is providing vocational training for everyone. Statistics from the 1980's relating solely to West Germany predicted that by the year 2010, 7 to 8 million unskilled jobs would be lost and about the same number of jobs for skilled workers created. In 1993, more than 50 percent of the unemployed registered with the Federal Institute of Labor had not completed vocational training.

We were told that more than 90 percent of all youth in Germany are involved in some form of vocational training (either in the dual system, further training or university). However, among immigrant youth aged 15 to 18, only 40 percent take advantage of vocational or further training. If they had the same participation as other youth, the overall rate of youth participation in training would be closer to 98 percent. Increasing the participation of all youth in employment training remains a problem to which many solutions are being advanced.

- ***Success of All?***

According to officials at the BA, the relatively low participation of immigrant youth in vocational training programs stems from a lack of understanding among many parents of the value of a training placement and its ultimate benefits when contrasted with the short-term opportunities for their children in full-time jobs as unskilled laborers. Many of these immigrants came to Germany as "guest workers" 30 years ago. As German citizenship is very difficult to obtain, these immigrants are still considered foreigners. As a result they are still

legal citizens of their native countries and many Turkish (the largest minority) males are drafted into the Turkish army. To avoid the draft they pay exorbitant amounts, fueling their need for full-time employment and not participation in training. In addition, many of these young people have not had the benefit of good early education and can be considered "bilingual illiterates".

To address this problem, the BA has initiated a number of efforts, including:

- Hiring specially trained vocational guidance counselors to work with immigrants and recruiting counselors representative of the targeted ethnic groups.

- Producing guidance publications and other media in a variety of languages, especially Turkish.

- Providing special funds to training centers for extra services to trainees with language deficiencies, supporting training in workshops for the apprenticeship period, and for special coaching for exams to enable youth to receive a regular credential.

Because of a shortage of funds, many of these measures are being reduced. However, the Germans feel that this expense is less than the cost of unemployment and the resulting social implications. As one official put it, "If only 40 percent of these youth are going into training, the remaining 60 percent will eventually be unemployed immigrants--a potentially explosive situation. The clock is ticking."

Germany is also working to integrate women into a broader range of occupational areas. Currently, women are represented in a limited range of occupations in the western *Länder* and increasingly in the eastern *Länder*. (Previously in the east, companies were forced to train girls and boys equally. Now they are under no such mandate and are not training girls equally.) Of the 60 most popular occupations, females are concentrated into about 15 occupations, primarily hairdressing and retail.

At the school level, opportunities are available for any youth who may need special help to succeed. One or two lessons per week can be organized for students in special problem areas. Additionally, firms, may on occasion hire teachers to provide special help. Trainers in the workplace also fulfill multiple roles with their apprentices. This includes help and advice with social, personal and vocational problems.

- ***Shortage of vocational teachers.***

There are 20 times more vocational trainers than vocational teachers (40,000) in the dual system. To address the teacher shortage issue, there are discussions concerning increasing the salaries of vocational teachers above those of teachers in the *Gymnasium*. Given the shortage of teachers, there is often difficulty in providing the basic education required under the dual system.

Because the apprenticeship examinations are based on in-firm training which the Chambers determine with the vocational teacher serving only in a consultative role, many large firms are questioning the need for vocational schools. The large firms tend to run their own schools and workshops and provide much of the theory as well as the practice of the profession. However, ninety percent of training-certified firms are small and medium-sized enterprises and do not have the in-house capacity to provide comprehensive instruction and training. They and their apprentices rely heavily on vocational schools to provide the essential foundation of theoretical knowledge.

SWEDEN

I. Elements of the System that Support a Quality Learning Program of Career Preparation

A. Reforms Affecting the Quality of Vocational Education.

The Swedish education system is undergoing comprehensive reforms which are moving it from a highly-centralized to a decentralized system. At the center of the reforms, vocational education is being more fully integrated into the curriculum and in-firm training time has become a requirement for most of the curriculum options. The reforms are the result of general dissatisfaction among employers with the prior system, competition abroad and the need to improve access to higher education for students studying vocational subjects. As in Denmark and Germany, Sweden has debated the scope of vocational instruction (narrow-verses broad-based), and there are efforts to foster closer links between academic and vocational education. Additionally, a number of social factors are affecting the restructure of education such as the need to decompress wages and create a more competitive environment with incentives for further education and training.

The current Government has made building the best education system in Europe among its central public policies. However, education reform has not been imposed strictly from the national government. Employer and labor associations have played a critical role in initiating and driving the reforms. In addition, key responsibilities for funding allocations and curriculum have been transferred to local municipalities for quality implementation.

Despite obvious differences between Sweden and the United States, there are a number of areas where the Swedish reforms to higher secondary education serve as an important looking glass for reforms proposed in the United States. Both countries seek greater participation of business in education, greater access of vocational students to higher education, and greater emphasis on the development of higher standards. Because of a decentralized education structure, the role of the national government in bringing about education change is increasingly limited.

- ***The move from a centralized to a decentralized education system.***

The Swedish Government is decentralizing its educational system--a radical step for a country that has historically had very tight national control over every aspect of the school system. The desire to attain a balance between national regulations and local control by municipalities has led to the establishment of a national framework with local decision on how to implement and achieve goals. The national curriculum has been eliminated in favor of syllabi that indicate **what** pupils are to learn. The **how** is to be determined by the local municipalities. Each municipality is to develop a strategic plan outlining how education will be delivered.

The funding stream has also changed. Each municipality now receives education funding

based on demographics and geography in a lump sum, with no particular local activity requirement. They can then decide how much is spent on education versus other municipality needs. Under this new reform, the municipality, not the national government, is responsible for employing the teachers.

- ***Competition Among Schools and the Provision for greater choice.***

The Swedish system promotes program quality by creating a choice system whereby schools are in competition for students and government subsidies follow the students. Schools compete for children, and public funds follow the child. As a consequence, schools aggressively promote their attributes, effectively communicate with parents and ensure that they are delivering quality education at high standards. We were told, "Schools are always looking for innovative programs to start, seeking seed money from the government for program development, and then marketing to attract new students." Students and their parents select the most appropriate school based on the school's reputation, areas of expertise and the convenience for the family.

If the program of study is not offered at the local school, the student may chose to attend another school. The local school then pays the receiving school the funds associated with the student and provides for the student's transportation. Companies can also contract with schools to offer their own education program for students. Depending on the program offered, the government may provide as much as ten percent of the cost of these operations, plus the education funds that follow the student.

Program accessibility and entrance qualifications are driven by a combination of student and employer supply and demand. Although there are well-defined national branches within each of 16 national programs, upper secondary schools have the option of developing additional branches, based on local needs, thus allowing for greater student choice and concentration on an area of unique interest.

Some vocational programs have limited access by requiring high grade point averages for entry, thus keeping an oversupply from emerging in some of the most popular vocational fields. For example, to get into cosmetology in Stockholm, a student needs a grade point average of 4.3 on a five-point scale, but can have a lower grade point average to enroll in the two university tracks. Students who cannot meet the entrance criteria must look for a second choice option.

- ***The new upper secondary curriculum frameworks.***

The Swedish upper secondary school is equivalent to grades 11, 12, and 13 in the United States. In the old system, students had three options: (a) a one- or two-year special course for vocational training, (b) a three-year program for those planning on going to university and (c) a four-year program for those entering technical and engineering education.

Students in the vocational branches received very little academic preparation from the general studies curriculum. The old system, with its 150 different vocational programs, is now being replaced with a system that has only 16 national programs that enable students to specialize in a number of branches within national programs.

Of the 16 clusters, 14 are primarily vocational oriented, and two prepare primarily for higher education--social science, and science and technology. Approximately 45 percent of Swedish students choose the two university options. The main university track is the social science option that offers branches in economics, humanities, social sciences, and international business studies. Less than 17 percent of the students go into the science and technical study option.

The programs are designed to give a broad basic education within a vocational field as well as to provide the foundation for continued studies upon completion of the upper secondary school. The two higher education preparatory courses (the natural sciences and social sciences programs), meet most of the entrance requirements for high school and university studies, whereas the other 14 programs lead to a general qualification for studies at high schools and universities, but may not necessarily meet the special requirements of many courses of study or majors in higher education.

The revised mission of vocational education is to prepare students for further training and lifelong learning, rather than for a specific occupation. In prior years, all vocational training was transferred to the schools. During this time, most employers dropped their vocational training emphasis. Because of the perceived decline in the quality and status of vocational training, employers' associations demanded that the system change from two- to three-year vocational programs, with emphasis on new modern courses and on upgrading the standards. Most employers are not in favor of pure apprenticeship programs and believe that to meet the needs of modern industry, more formal in-school training is required. The new system provides a way for that to occur and also to get employers more involved in on-the-job training.

Each national program has different curricular emphasis with a combination of compulsory and optional classes. However, the system as a whole strives to avoid dead ends in courses of study and to allow opportunities to change direction and make successive choices.

In addition to the 16 program options, each upper secondary municipality provides individual choice options. These options are designed by the student based on personal interests and needs in cooperation with the school. Between six and ten percent of high school students enroll in individual programs. Often, these are students who do not know what they want to do or cannot qualify for one of the existing programs. These programs are three years in duration and equivalent to the national programs. Both theoretical and vocational content is included as well as certain compulsory core subjects.

The new education frameworks are aimed at addressing the changing workplace requirements that are resulting in the need for workers with higher levels of competencies, a broader academic base, and more in-depth technical knowledge.

- ***The move toward increased employer responsibility for on-the-job training.***

The new reforms in education make it possible for the local upper secondary school and employers to work closer together. A number of policies provide structure and support for this partnership.

(1) *The new system of upper secondary schools requires vocational students to spend at least 15 percent, or 360 hours of their secondary school time, in on-the-job study.* This comes during the third year of their upper secondary school studies. According to one headmaster, "Vocational educational is now more theoretical in the new system. We have fewer pathways, but broader ones and the vocational programs are less specialized. The company is to take greater responsibility during year three for providing job specific preparation."

The purpose of the on-the-job requirement is as much to expose young people to real workplace activities as to get employers more involved in vocational programming at the local level and to bring the companies and schools back together. Since the trend among many young people in Sweden is away from preparation for industrial jobs, it is believed that by providing an opportunity for on-the-job learning experiences while in high school, more will pursue rewarding and challenging careers available in the industrial sector.

(2) *Funds for education now follow the student in a way that enables firms to create their own schools.* To do so, they must provide the common core curriculum in addition to the technical subjects. Many see this as a way for large companies to get high school graduates who have both the academic and the broad technical base needed for the current workplace. Some view this as essential if industry is to ensure that their future workers have the education and training comparable to the standards in other European countries. While small, the opportunity for industry schools and industry apprenticeship programs is one that many employers see growing in Sweden because they do not think the public system is of sufficient quality to compete with other European countries.

A few large companies support an internal upper secondary school in order to develop a quality workforce to help them gain advantage in the European Community market. There are differing opinions as to how company schools can or will affect the school system. Some believe the expense of running these schools prohibits wide adoption of this practice, while others see the company school as a means of creaming off the best students.

The challenge, we were told, is to get companies to take greater responsibility for developing quality on-the-job learning situations. The new reforms are in their third year nationally and

schools are having some difficulty in finding enough training places for students. Two of the major challenges for securing company participation have been:

- Young people in work-based learning situations are viewed primarily as learners, not workers. Companies do not pay students for work-based learning activities. This distinction may lessen the commitment of companies to providing quality work-based learning experiences.

- During a trial implementation period, participating firms received compensation for providing on-the-job training opportunities. When the full national reforms were implemented they removed this compensation. However, many firms feel they should receive payment under the new system, while some critics feel strongly that this will prevent some employers from providing on-the-job training. Specifically, it makes it harder for small and medium-sized firms to be involved.

Unlike Denmark and Germany, Sweden does not have a strong history of apprenticeship training. Consequently, the work experience component required in upper secondary school is not considered a true apprenticeship. Apprenticeships are uncommon during upper secondary school. They fit into the "individual program category" and can be designed for those students who may not fit into a national program. Apprenticeships are available for students who get a position in a "company" school. These students would be paid for the work experience, classes are held at the company, and training is more intensive.

About two percent of students elect a three-year apprenticeship training option. The program is organized in a company with a trainer. The student still must complete the core subjects that all other students must complete and the company must provide them support for theoretical training. There is cooperation between the school system and the employer in providing the core subject-matter instruction. The apprenticeship training attracts youth who know specifically what pathway they want to pursue and also represents an option for "school-weary" students who seek a different form of education.

- ***Changes in the structure of work and wages as well as efforts to increase worker productivity.***

The nation has a very compressed wage scale. For example, new blue-collar workers earn about 80 percent (approximately $9.00 per hour) of what veteran workers earn in a given field. University-trained workers earn only slightly more money We were told that there is little incentive to pursue further education since there is less than a 10 percent difference in the wages earned by a college graduate and those earned by a vocational program graduate. Youth who have finished a vocational program enter the adult market in that field making 80 percent of what adults make.

The goal of one of Sweden's largest employer associations is to increase productivity by decentralizing the wage structure and abolishing the formal distinction between blue-collar and salaried personnel, thus creating more flexible workplaces and allowing greater mobility within the company. They want to revise the labor laws and are seeking ways to create a greater spread in wages and salary scales to motivate workers to work harder. They stressed the importance of being able to base pay on performance, particularly the institution of a wage system that promotes pay for skills, quality, and quantity. As one business leader said, "Our challenge is to tell young people about the opportunities in their country."

Currently the nation has an unemployment rate of 10 percent, but during the boom years of the 80's, they had a severe problem of scarcity of qualified workers. Several business and industrial leaders interviewed said that by the late 1990's they will not have a sufficient pool of people to choose from because of an increasing shortage of youth.

B. Governance of the New System.

- ***Strong Central Authority Control over the Content of What is Taught.***

Whereas there has been significant devolution of managerial responsibilities and more autonomy and authority entrusted to local school management for decision-making, development of curriculum frameworks still takes place on a national level. The central authorities exercise control over the curriculum content and frameworks. At the national level, education is organized into two units:

(1) The Ministry of Education has been substantially cut down by the reforms to a core staff. It sets the mission and goals for education, including the learning objectives and a required set of core courses (Swedish, English, Math, Civics, Religion, Science, Health, and Art.).

(2) The National Agency for Education (comparable to the U.S. Department of Education) is responsible for taking the Ministry's missions and goals and developing and revising a national plan in partnership with business and labor. Every three years the National Agency revises the national curriculum syllabi. Their first annual report on the Swedish system was due January 1, 1994. It compiles information from local municipalities, including their progress in meeting the national goals, and includes a diagnostic assessment of how the new system reforms are working.

Significant work remains for local implementation and adaptation of curricula, but the guidelines are clear and authoritative. These guidelines also serve as minimum requirements for local firms involved in training along with vocational schools. They provide direction about what has to be taught. Since industry is involved in their development, they are seen as relevant and responsive to needs.

The municipal authorities take the national goals and syllabi and develop them into a local program. These authorities are also responsible for conducting an evaluation of each program.

As one headmaster said, "We work now more like a company. We have our goals, but we can decide how to achieve those goals."

- ***Close relationships and vehicles of communication among employers, unions and the educational community.***

The education-industry partnership (which includes organized labor) is strong at three levels--national, regional, and local. Formally, at each level there is a council or broad partnership comprised of educators, business, and union representatives to oversee the system. The representatives of the councils are members of powerful employer and union associations. There is a committee structure for each of the major cluster areas which ensures quality for each occupational area.

Carl Magnus Hektor, of the Swedish Engineering Employers' Association, indicated that since the new reforms give more control to the local municipalities, employers have more input and are getting even more involved. Schools, in partnership with their local governing boards and employers, are now beginning to create their own programs based on local labor market needs.

Employee and employer associations have full-time liaisons whose sole responsibility is to maintain active connections with the various levels of the education system from federal to local. Informal channels of communication also exist between employers and schools. For example, teachers at the Tumba School visited said that employers will call them as a reference prior to hiring one of their students. They will also call teachers and tell them when they have employment openings and request a student referral. Some teachers are given release time to follow up with students at the worksite and to assist employers in developing courses. Although there is movement to ensure that all occupational teachers have this release time, presently these are school-by-school efforts rather than the result of system-wide policies. There has been little if any involvement of academic teachers in these activities.

Parents are also involved stakeholders both as parents and employees. Local schools invite parents to open houses and parents routinely assist in finding job shadowing and work placements at their own worksite.

II. Content and Structure of the Learning Experience

A. Overview.

Frameworks (*Larophans*) defined and mandated at the national level, state the purpose and structure of the 16 subject program areas (see Chart 1), along with the educational objectives to be achieved by all students in each subject area. At the municipality level, the goals are translated into competencies by the regional council. At the local level, schools and employers define what can best be taught at work or at school and develop the programs to meet the competencies. At the municipality and local school levels, decisions regarding education (primarily curriculum and competency development) are made by committees comprised of

teachers unions, employee and employer associations, teachers, headmasters, parents, and students elected by their peers. Again, a strong representation from the employer and union associations is expected to help guide the educators.

CHART 1

NATIONAL PROGRAMS

CHILD RECREATION PROGRAMS For work within child-care, after-school and recreational activities, health, sports and libraries.	**BUILDING AND CONSTRUCTION PROGRAMS** For work within the building sector - houses and buildings - or the construction sector e.g. streets and roads.	**ELECTRICAL ENGINEERING PROGRAMS** For work within installation, repair and maintenance of electrical, telecommunications and electronic equipment.	**ENERGY PROGRAMS** For work within the energy sector e.g. electricity and power stations, heating-ventilation-sanitation as well as related work on ships.
ART PROGRAMS Broad basic education for work within art related professions.	**VEHICLE ENGINEERING PROGRAMS** For work in the repair and maintenance of cars, lorries and machines.	**BUSINESS AND ADMINISTRATION PROGRAMS** For work on commercial and administrative tasks within industry/ commerce and public administration.	**HANDICRAFT AND TRADES PROGRAMS** For work within a number of different handicraft and trade professions, with a large part of the education being located at work-places outside the school.
HOTEL, RESTAURANT AND CATERING PROGRAMS For work as e.g. a receptionist, conference organizer, waiter or chef.	**INDUSTRY PROGRAMS** For work within industrial production covering amongst other things programming and operating computer controlled machines and process.	**FOOD PROGRAMS** For work within food processing, sales and distribution.	**MEDIA PROGRAMS** For work within advertising, various forms of design as well as the production of printed media.
NATURAL RESOURCE USE PROGRAMS For work within agriculture, forestry, horticulture and animal husbandry.	**NATURAL SCIENCE PROGRAMS** Mathematics, science subjects and technology, also as preparation for further studies.	**HEALTH CARE PROGRAMS** For work within the health, dental care and support service sectors.	**SOCIAL SCIENCE PROGRAMS** Social issues, economics and languages, also as preparation for further studies.

The frameworks for the 16 upper secondary national programs must be offered in each school. The programs are each three-years in length, with the first-year curriculum common to all programs. In this manner, a minimum standard of content is set for all students--not different or lower for vocational students. Students, however, can take more than the required core

level (this is especially true of the university-bound students who are encouraged to take more than the required core). For example, students may elect to take 200 hours of math rather than the required 110 hours. All of the national programs articulate with post secondary level education and thus students who have focused on vocational programs are not discouraged from seeking further education and the threat of a dead-end educational experience does not seem to be present.

The instructional year is 178 days. To graduate from upper secondary school, vocational students must pass a minimum of 2,400 hours (academic students must have passed 2,180 hours). At least 15 percent of the vocational student's education must be delivered at the workplace (hence, the additional hour requirements for vocational students). Except for the required career exploration programs in compulsory school, students preparing for higher education do not have a required work-based experience. (See Chart 2 for the breakdown of these by core and vocational courses.) The "passed hour" concept is similar to, but not truly, a performance-based system. Whereas it can take as many as 3000 actual hours to obtain 2,400 passed hours, students cannot pass in less time. However, they must demonstrate that they have mastered the required competencies.

B. Structure of the Learning Experience.

The upper secondary curriculum is modular- or course-oriented. Each course or module must be at least 30 hours. The courses are offered to ensure that (1) students receive the same learning opportunities, (2) there is maximum transferability between one course of study and another for as long as possible, and (3) students have the flexibility to tailor their studies to individual career choices and interests.

Each student must complete an academic core, a technical core, and a technical concentration. Students in the vocational program options are required to take 680 hours of core subjects. Core subjects include Swedish, English, civics, religious studies, mathematics, nature studies, sports and health studies, and aesthetics activities. Vocational students spend approximately 60 percent of their time in their vocational area of concentration. Each student has an individual choice of 190 hours in which they can do optional work. This choice enables students to undertake additional language studies or to acquire special qualifications in a particular subject such as mathematics or science. Additionally, students must spend at least 30 hours on a special project. The project allows for in-depth study in an area of interest and trains them to work in an investigative manner.

Chart 2

Courses	Hours
Swedish	200
English	110
Mathematics	110
Civics	90
Natural Science	30
Aesthetics	30
Individual Choice	190
Sports/Recreation	80
Religious Education	30
Vocational Subjects	1,370
Local Supplement	130
Special Projects	30
TOTAL	2,400

The system provides for continuity during the upper secondary school years by housing students who are in the same vocational program together with the same teachers over a three-year time sequence. They use a block scheduling system that allows students to spend, for example, during year one, two full days in theoretical and lab-based technical work and two or more days taking their core subjects. The sequence of study is designed to provide for broad-based study, gradually resulting in greater specialization and an increase in practical occupational instruction.

Year One. All students in a given program take the same academic courses. In the first year the day is structured so that in the morning students receive theoretical instruction in core academic areas and in the afternoon engage in practical application and experience in their chosen program. During the first semester of the 10th year the student takes general subject courses and by the second semester is taking classes which are more specific to his or her program area. (At this point, most have selected one of the 16 programs.) Additionally, students spend one week with an employer or several different employers in the field he/she wishes to study.

Year Two. Students choose a specific branch within the program and take academic and occupational classes for that branch. One full week is spent each semester (fall and spring) at a worksite(s) appropriate for that branch.

Year Three. The student spends two days a week learning related academics and three days a week at the worksite. If the worksite is in a large company, the student moves around to see the full operation. In a small operation, the student will typically shadow one person and begin real work as if he/she were an employee.

C. *Case Study*: Observation at a Swedish Upper Secondary School.

Tumba Gymnasium is a large high school, with a major emphasis on graphic education, but the school also offers programs in transportation, industrial, and university education. It has an enrollment of approximately 1,700 students between the ages 16-19, and an average class size of about 32 students. About half of the students are enrolled in the two higher education programs while the other half are enrolled in vocational programs.

Each occupational program or cluster at the Tumba School is designed by a municipal and a local council using the guidelines established at the national level. These council's include students, industry and union representatives, teachers, the director of studies, politicians and members of the school board. Tumba's municipality and two other municipalities have formed a consortium. Programs offered in any one municipality are open to students from all three municipalities on a competitive basis. The multi-media cluster at the Tumba School has proven to be extremely popular among students from all three municipalities.

The proposed course of studies for the multi-media cluster follows:

- Core subjects first two years
- Transition mathematics (algebra, geometry and trigonometry)
- English (150 hours)
- Computer science
- Business economics
- Media science
- Media technology
- Media technique
- Optional and advanced courses

All students within the cluster take the same core subjects. In the second year, students chose a more specialized course of study or stream and devote three days to academics and two days to occupationally-focused hands-on experiences. Academic course content is to reflect the focus of the occupational cluster. By the third year, students are to spend three days a week at a firm and two days at school. Students have primary responsibility for securing a worksite placement. Those who are unable to do so will remain at school and participate in simulated work experiences.

D. *Case Study*: Observations at a Company School.

The Ericsson company is an international leader in telecommunications and electronic defense systems. **The Ericsson Company School** accepted 20 "freshmen" last year, from an applicant pool of 72. In past years, the school has accepted as many as 32 students. There are six teachers on staff and that the school currently has an enrollment of 60. The school provides an upper secondary education with all classes being taught at Ericsson's facilities. Academic/theoretical courses are taught by teachers hired by the local upper secondary school/gymnasium. Technical courses and modules are tailored to Ericsson's needs and are taught by Ericsson staff or teachers hired by Ericsson.

Students participate in a 3-year, 40 hour per week program that alternates theoretical and practical experiences. During the first two years, students spend 14 hours in theoretical courses and 26 hours in vocational theory and experiences. The vocational experiences include general training in mechanics and electronics. By their third year, students spend 40 hours per week in vocational theory and experiences. Depending on the company's needs, students may specialize in Re-working Engineering, Electronics, Metal Plate Engineering, and Maintenance Engineering. School staff estimates that students at the Ericsson school receive four hundred hours more of technical instruction than students in a regular gymnasium.

Students who graduate from the Ericsson school are not guaranteed a position with the company. During their first year at the school, students receive government funding. During their second and third year at the school, Ericsson pays students the stipulated wage rate. Children of company employees are not given preference in the selection process.

E. Strategies to Address the Needs of all Learners.

The system promotes positive, personal and social growth. We noted the following strategies used to address the needs of all learners, including concerns for their personal and social growth.

- Students stay with a vocational teacher for the entire three years. This encourages the development of a trusting and constant relationship to evolve that will enable an adult to consistently assist students with social/emotional issues. The teacher serves as a facilitator and mentor.

- Courses such as algebra, geometry and trigonometry are not taught as sequential subjects but as combined math concepts as they apply to the vocational area of study. For example, academic or theoretical knowledge is often provided on a need-to-know basis.

- Standards are not lowered so that students can meet them, but instead resources are available for students to receive additional assistance to meet the standards, such as remedial studies, assistance after school, and individual instruction by the teacher.

- Girls receive a special voluntary two- to three-week course in the summer which introduces them to non-traditional fields. This is to encourage females to enter into traditionally male-dominated fields.

- Students are empowered to take charge of their learning process by engaging in projects. Classes are not restricted to lecture style. Group project learning is utilized to actively engage in the learning process.

- If a student is not successful in one program, the school system is still responsible for helping to prepare the young person for entry into the workplace. Youth who do not pass after every effort is made on their behalf, are placed into an individualized program that combines schooling and working until students are employed.

F. *Case Study*: Observations at a company program for youth with special needs.

The electrical power utilities in Stockholm initiated a "cable academy" as a three-year apprenticeship program targeting troubled youth. The program was started in response to a shortage of personnel in the electrical field, particularly those willing to meet the physical rigors of the job. For this work, however, the individual needs much theoretical training. The strategy was to recruit youth into the field who had not experienced success in the regular school setting. This strategy has proven largely successful.

The academy selected 18 youth from 40 applicants. The trainees participated in an initial six-month test period working in the field, after which they became employees in training. At the request of the union, these youth have been treated as adult workers--for example, if late, they are docked a proportion of their pay. After the trial period, the program involved two days a week in theoretical training and three days a week in on-the-job experiences. At the academy, trainees learn math, Swedish, English, and principles of electricity. Seminars are provided in areas of social development and interpersonal relations. Trainees select from a number of options for concentration, including overhead lighting, street lighting, underground cables, and digging machines.

All but one of the students will be offered a job upon completion of the apprenticeship. The company has been taking new students every third year, but will not continue the program because they have now satisfied their need for qualified personnel.

G. *Case Study*: Observations of Work Experiences for University-bound Students.

An excellent example of integration was discovered in an entrepreneurship program at Gangsatra High School. Students enrolled in the social science (university prep) curriculum had created and were operating their own companies. The marketing and the trade and administration teachers were working together with academic teachers to help students form and run these companies. The class had a private sector person who served as an advisor.

Students had selected the focus of their companies based on a market survey they had conducted to determine the products and services to offer. Each student group or company had opened a bank account, had responsibility for accounting and other activities, and was required to do presentations in both English and Swedish.

One company was running an ad business. The company is registered with the Young Business Enterprise of Sweden and sold shares of stock to raise the capital needed to start the company. The ad company had produced 18,000 brochures that were going to each household promoting advertisements for radio and newspapers.

Another of the companies operates a school store. Again shares of stock were sold in order to purchase items for the store. Students ordered stock weekly, managed a personnel schedule, and had organized their personnel into working teams with defined assignments. They prepared a monthly financial report and ran a daily count of their books.

The two companies which operated enterprises within the school paid the school rent for their facilities. Students had received guide books from the National Youth Enterprise Organization to help them in planning their business.

These students take seven hours a week in marketing; seven hours in business administration in which they learn about financial systems, banking, and accounting; and two hours in their company. For these students, the youth enterprises focus in marketing and business studies has become a concentration for their social science curriculum.

H. How Knowledge and Skills are Assessed?

The national academic goals are assessed in English, Swedish, math, and natural science with a standardized test at the 5th and 9th year. It was our impression that assessment is an area in which there seems to be great dissatisfaction, especially in the academic courses. Vocational classes used paper and pencil tests along with project assessment to determine mastery. This project assessment is done informally and on an individual teacher basis. There is much interest around how to standardize this type of evaluation. If a student did not reach mastery they would go back and relearn or retry. The only national vocational exam is in the automotive trades.

Parliament has revamped the grading system to one that uses four levels--passed with high distinction, passed with distinction, passed, and not passed. Many occupational classes had a

skills checklist which allows students to see the skills they would learn and to monitor their own progress. This checklist is also used by the teachers to assess mastery.

I. Training of Trainers and Teacher Development.

- ***Worksite mentors.***

Worksite mentors are selected from the most senior and experienced workers in the company. There does not appear to be a central training program although the Tumba school indicated that the teachers do some training of worksite mentors in pedagogical skills.

- ***Teachers.***

There are specialized four-year training colleges for *upper secondary teachers*. Teachers in compulsory school are trained to teach all subjects in grades 1-4 or 4-7. Upper secondary teachers are expected to teach at least two or three subjects.

Vocational teachers must have industry experience and a teaching certificate acquired by one year of study at the teaching college. Currently that certification is under review by a special committee appointed by the Minster of Education. It is believed that with the new regulations, the vocational teacher will need broader knowledge and that the knowledge base will have a shorter life span. Continued work experience will be important for teachers to stay current with technology. Industry and unions play a role in keeping vocational teachers current in their fields by providing further training. Unfortunately, these activities are limited and are often requested by teachers.

III. Strategies to Ensure the Success and Motivation of all Youth.

The Swedish do an excellent job of ensuring that students have a common foundation of knowledge and that they do not fall through the cracks.

- **Students in compulsory school, grades 1 through 9, have a good foundation before moving onto upper secondary.** All students in compulsory school have the same requirements and are held to a common set of standards. We were told that at this level, learning is very hands-on and often older and younger students are in the same class, helping each other.

- **Career preparation is a strong component of the Swedish system.** Workers are routinely encouraged to bring their children to work to expose them to real life jobs. Compulsory education requires that all students get a minimum of three weeks exposure to the occupational clusters. Every 7th grader must spend at least one week in a job in the industrial-technical sector, every 8th grader gets a week exposure in the service sector, and every 9th grader spends a week in a health-care or day-care facility. This is an excellent opportunity for youth to be exposed to careers early in life and to begin thinking about and setting career goals. Additionally, each school also has an

"informer". This person's responsibility is to educate students about their upper secondary choices. These are people who know the labor market. As a result, students are prepared to make a "choice" at the end of their 9th year.

If a student in the 9th year is not academically or emotionally ready to go on to upper secondary school, has not made a program choice or cannot get accepted into their program choice, they can elect to take another year of general academics and career exploration. These students are not made to feel like failures, it is accepted as an alternative choice.

The role of the counselor is to help students select the right concentration once in upper secondary school. Subsequently, most of the guidance is provided by the vocational teachers. Vocational teachers also assume the responsibility for helping students find on-the-job training and for getting them placed in employment upon high school completion.

- **There is no "general track" of study at the upper secondary level.** By age 16 every student selects a program cluster to begin their studies--vocational studies and university-bound alike--and then gradually specializes, always receiving a solid academic foundation to ensure transferability and maximize options. The outstanding feature of the Swedish upper secondary system is that it provides every student with a focus and a niche. They always belong someplace and are working toward a defined goal.

- **There is little or no penalty for making a wrong choice.** The education system is free and has multiple reentry points. An adult can chose to reenter at any time to take more courses or to change careers; and any upper secondary degree--vocational or academic--makes the student eligible for university, although there are admittance standards.

- **Performance counts.** There is a clear link between what you learn at school and what you have access to after school. To be enrolled in some vocational programs, students must have higher average grades from compulsory schools than those needed to get into one of the university level programs.

- **Extra efforts are made to serve the special needs of students.** Special education students are integrated in the regular classroom where possible. By law, if there are more than five non-Swedish speakers with the same native language, they are entitled to lessons in their own language. This means a teacher must be hired using general budget money for these students.

  Eight percent of the student population receives a program individually created for them because they are high risk, handicapped or unmotivated. There is the individual choice option for the one to two percent who cannot fit into one of the national programs.

- **All students under the age of 20 must be provided with an upper secondary education and those who do not enroll (about 10 percent) receive further education in youth centers.** The centers have the responsibility for tracking these young people and doing whatever it takes to get them back into school. Usually this means creating a special program based on their interests and needs in an effort to get them into school or a job.

- **The system which governs upper secondary students also governs adult workers seeking retraining.** As a result, adults may attend the same classes as 16 to 19 year old students. This seems to have a positive influence on the dynamics of the classroom experiences and on the younger students.

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE AND PROGRAM DESIGN IN THE UNITED STATES

For learning to be relevant enough to young people to sustain their motivation and commitment, it must be a part of a clear pathway to success, replete with real opportunities that are worthwhile and attainable. To create this reality, educational reform and practice must be linked to economic development and employment prospects.

The prospects of educational success must not be lost to youth prior to the point when they are forced to contemplate their future. Rather, every young person must have at his or her command a quality core educational background as a framework on which to base future decisions and to integrate further knowledge. Until we as a nation make the commitment to keep the vast majority of our young people within an acceptable band of achievement, it will be difficult to build high quality systems of employment preparation in which the majority of youth can participate and find success. This requires rethinking our approaches to compensatory and enrichment education to ensure that every child receives a rich and rigorous elementary and middle-grade education with continuous supports appropriate to their needs.

Like a solid educational foundation, employment preparation cannot take place in the absence of job opportunities. Young people must be aware of the link between their employment preparation and the economic opportunities and viability of their communities. Where there is little economic viability, there is little hope and personal investment on the part of youth. If mechanisms do not exist to support these opportunities locally, young people should be accorded the opportunity to access opportunities outside of their localities.

Young people must be exposed to role models in those careers with which they can relate, preferably in a mentoring capacity. Knowledge and skills need to have immediate applications, along with multiple opportunities for reinforcing and refining those skills. This is the true challenge for school and work-based learning and those involved in creating these types of reinforcing experiences.

Business and labor need to provide employment opportunities for young people and share in their educational development. Mechanisms must also exist to help link young people with these willing business and labor partners. This is a critical role that can be played by government employment and information agencies, schools and community-based organizations.

At present, however, mechanisms for involving firms and unions in work-based learning programs are not readily available. The federal government should devise supports to trade associations and unions to support the capacity of their members to create and support quality learning environments for young people as well as incumbent workers.

The federal government should also continue and escalate efforts to develop national academic and skills standards. Standards are essential to the development of a quality system because they help to create a common vision and are a means to assess and benchmark results.

Greater business and labor support of youth education and training may foster quality learning environments as businesses develop workers with more flexible skills. The federal manufacturing technology centers and state manufacturing extension centers are existing mechanisms which can be expanded to help firms upgrade training capacity in addition to their manufacturing processes. Major investments must also be made in the staff development of educators in both school and the workplace to help them design programs and use learning strategies that support the linking of school and work-based learning.

Labor market data must also be readily available to help predict labor market needs, and mechanisms must be in place, such as staff and curriculum development, to shape programs in line with these changing needs. At present, these data are not routinely available to program providers or consumers in a way which will inform program development and decision-making.

Additionally, career guidance and exposure to the world of work must be available to ensure that a solid foundation is in place so that young people and their parents can make informed decisions about their future and can select the appropriate pathway. This requires a radical rethinking about our current structure of guidance and counseling and the way we initiate young people for adult roles.

To maintain motivation and optimum performance, student progress should be determined and feedback provided continuously. This suggests the need for different modes of assessment designed to inform student progress and program success rather than penalize and discourage student advancement. In this regard, there is progress being made toward the development of more authentic methods of assessment including portfolios, project work and competency-based measures.

The structure of programs should mirror a commitment to the development, success and high expectations for young people. In this respect, we have developed a number of promising models such as career academies, high schools with a specific focus, tech prep programs, and our version of youth apprenticeship, that reflect a restructured learning environment or program that provides options for multiple pathways including attendance at four-year institutions. These options also require a commitment of focus by young people and ensure that they do not complete secondary education without a field of initial specialization that informs and prepares them for certain career possibilities whether or not they choose to pursue them. We need, however, to make these opportunities more universally available, in addition to other options that provide for greater flexibility in the time, place and structure of learning. This means recognizing the skills and processes valued in the workplace and ensuring that young people have access to these values, knowledge and experiences whether they are simulated in a school or service learning environment or in an authentic workplace.

Programs need to be founded on good educational practice, be well-funded, and embrace state-of-the-art workplace knowledge and experiences. Teachers and workplace mentors must be well-trained and able to provide ample support through a variety of approaches to ensure student success. Program completion should result in respected credentials and worthwhile

opportunities. Finally, we must recognize and reward young people who are outstanding in these occupational pathways, in the way we recognize and support National Merit or Westinghouse Science scholars for their effort.

We should not take shortcuts or allow diminution of our commitment to the needs of youth. We need to make assurances to American young people that if they are willing to make the individual effort, they will have occupational options of value and access to further education.

APPENDIX

Study Team Members

The Quality Programs Team was headed by ***Dr. Glenda Partee***, Assistant Director, Council of Chief State School Officers. Dr. Partee has provided staff support to the Council's connecting school and employment priority since its inception. She participated in the Council's 1991 study tour of Germany, Denmark and Sweden sponsored by the German Marshall Fund and authored the report of findings which has been disseminated extensively within the education community. She has extensive experience in policy research, issues of education reform, technical assistance to state education agencies and instructional systems design.

Ms. Jeanne Adair is a Project Manager for Jobs for the Future. Ms. Adair's responsibilities at Jobs for the Future are primarily centered on the delivery of technical assistance to Youth Apprenticeship demonstration sites. She also assists with program evaluation and research. Ms. Adair, a former New York City School teacher, has consulted to the Boston Higher Education Partnership, the Boston Education Foundation and the Boston Foundation on curriculum, program design and education, and is currently a Research Associate with Lesley College. In addition to her extensive teaching experience, Ms. Adair was Director of Women's Economic Development for Church World Service in Haiti and has served on various community development boards including the New York City Urban League. Ms. Adair holds Masters degrees from the Bank Street College of Education and the Harvard Graduate School of Education, where she is currently a doctoral candidate.

Mr. James E. (Gene) Bottoms, Ed.D., is the Director of the Southern Regional Education Board Consortium. For twenty-six years Mr. Bottoms has been working in the field of education as teacher, principal, counselor, administrator, scholar and researcher at the local, state and national level. He has extensive experience working with a variety of constituencies--teacher educators, state and national policymakers, educational agencies, and business and industry--in the pursuit of educational improvement. He is assisting 13 Southern States in establishing 26 pilot sites to improve basic competencies--mathematics, science and communication--for secondary vocational completers. He has developed a contract with the National Assessment of Educational Progress to conduct baseline assessment of 26 pilot sites in basic competency.

Ms. Mary Agnes Hamilton is a Senior Research Associate for the Human Development and Family Studies Department of Cornell University. Ms. Hamilton is presently responsible research and development related to the Cornell Youth Apprenticeship Demonstration Project, one component of the Cornell Youth and Work Program. She is Associate Director for both the Project and the Program. Her ethnographic research focuses on teaching and learning issues in the transition of youth to adulthood. The apprenticeship project provides a research and development base to examine the socio-technical development of youth as they create an apprenticeship system with structural supports in the workplace, in families, in community agencies and in educational institutions, as well as in state and national legislative initiatives and departments.

Dawn Krusemark is a Staff Assistant in the Education Issues Department of the American Federation of Teachers (AFT) addressing an array of school-to-work issues. She is currently working on the second in a series of publications sponsored by the AFT on world class standards which will focus on the work-bound student in other countries. Prior to joining the AFT, Ms. Krusemark served as a Coordinator of Workplace Learning Programs for the AFL-CIO of New York State where she set up literacy programs for workers in a variety of workplaces. Ms. Krusemark has a B.S. and M.S. in Elementary and Special Education and taught emotionally disturbed children at the elementary level for several years during which time she also served as president of her local teachers' union,

Ms. Mary McCain is Vice President for National Affairs of the American Society for Training and Development. She is responsible for ASTD's public policy activities at the federal and state level, focusing on the issues of quality and competitiveness, education and training, and the implementation and use of technology in the workplace. Before joining ASTD, Dr. McCain was Executive Director of a non-profit social and economics research organization, the Women's Equity Action League. Her previous experience includes working in the office of U.S. Senator Ernest F. Hollings both in Washington, D.C. and in South Carolina and with the Ethics Resource Center and the Urban Institute in Washington, D.C.

Darrel Staat is the President of Eastern Maine Technical College in Bangor, Maine and has held the position for three years. He is active in the local community working with such organizations as the Greater Bangor Chamber of Commerce, the Action Committee of 50, The Hogan Road Business Association and the Training and Development Corporation. At the state level he serves as a director on the Maine Youth Apprenticeship Policy Board and a corporator on the Maine Development Foundation. Prior to going to Maine, Dr. Staat held the position of Vice President at Florence Darlington Technical College in Florence, South Carolina. He received his doctorate from the University of Michigan.

Diane Swanson is Director of Educational Services in the Education and Human Relations Department of Printing Industries of America, Inc. (PIA). She has been with PIA for nine years. She is responsible for the promotion and implementation of meetings and seminars, training and vocational education efforts, including PrintED Accreditation for graphic arts secondary and post-secondary programs. Diane taught in public schools for seven years, then worked as editor and public relations officer for several small publications before joining PIA. She holds a Bachelor's degree in Political Science from Cornell College and has a fifth year in education completed through Northern Illinois University. She has extensive experience in the design, marketing, implementation and evaluation of education publications and seminars.

Chris Weaver is Louisiana's State Director of Vocational Education. From July 1992 to March 1994 she served Louisiana as Assistant Superintendent of Vocational Education, and prior to this she was principal of Woodlawn High School, a comprehensive urban high school. She also served as the principal of Caddo Career Center, a vocational center serving eleven high schools, for seven years and taught as a marketing coordinator for 14 years. She earned both her Bachelor's and Master's degrees and completed her "+30" at Northwestern State University. She completed 18 additional graduate hours in vocational education at North Texas State University. Ms. Weaver was selected as the 1981 Louisiana Teacher of the Year

and has gained substantial professional recognition during her career. She is Chairperson of the Program of Work Committee for the State Council on Vocational Education and is Principal of one of two Louisiana pilot sites selected by the Southern Regional Education Board. She is also a highly-regarded speaker on educational restructuring and innovation.

Ms. Jean Wolfe is the State Director of Pennsylvania's Youth Apprenticeship Program. Under Ms. Wolfe's leadership, the Pennsylvania initiative has grown into a nationally recognized model for preparing students to meet business and industry's demands for the highly skilled employees required to compete in today's global market. She is working with the Pennsylvania Departments of Education, Commerce, and Labor and Industry to develop the model into a statewide youth apprenticeship. Ms. Wolfe serves on the Steering Committee for the National Skills Standards Project in Metalworking and on the Institute for Educational Leadership's Committee to study how to engage and maintain employer involvement in youth apprenticeship. Prior to her appointment as State Project Director, she served as Regional Project Manager for the State's York and Lancaster County Youth Apprenticeship Programs. She brings over 15 years of business experience to the youth apprenticeship initiative, the last 10 years in an executive capacity with a Pennsylvania-based manufacturing company.

Mr. Mark Scott is Associate Director for Policy and Programs for the Center for Learning and Competitiveness, based at the University of Maryland. A graduate of Sydney and Harvard Universities, he was formerly Chief of Staff to the Minister of Education, Employment and Training in New South Wales, Australia's largest state. In this capacity, he was actively involved in the development of policies to devolve the management of school education and technical education to regional levels, to restructure the school curriculum, and to develop new systems for assessment and credentialing in revisions of education legislation. As Director of Communications for the Ministry of Education in New South Wales, he was responsible for communication strategy and policy in Australia's largest state government department.

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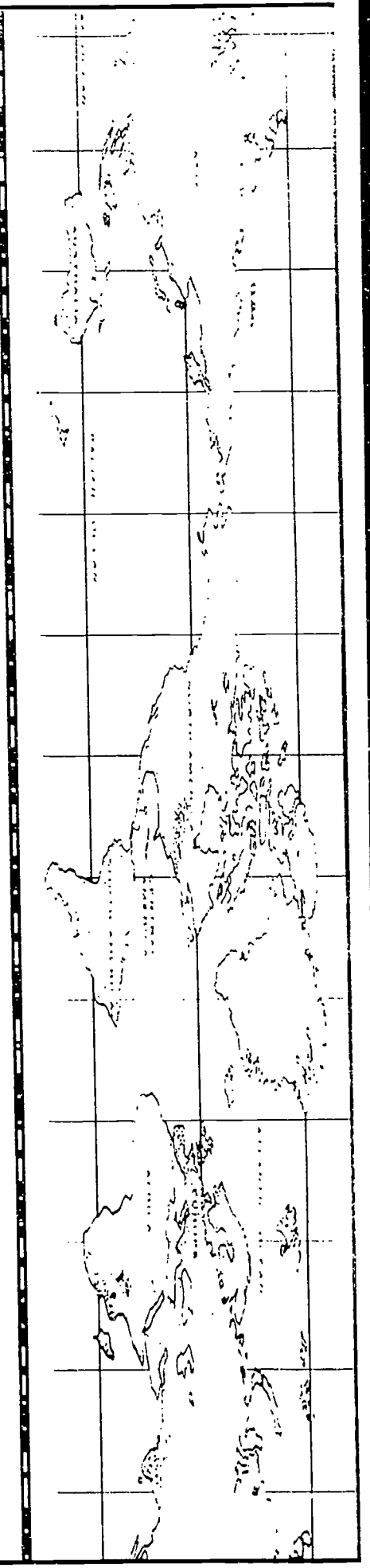

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