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ABSTRACT

Vocational education in Switzerland takes place mainly in three kinds of institutions. Apprentices receive training in small laboratories or workshops from a master, in larger companies from a special trainer, or in state or private workshops. Besides this job-oriented education, apprentices attend courses in vocational schools. Research in vocational education and work life in Switzerland is addressing these topics: vocational/professional education, adult education, education for special groups, humanization of work, technological change, unemployment, and new models for vocational education. The Swiss National Research Program focuses on three broad areas in vocational education. Research on personality development includes a learning-to-learn project for apprentices with learning problems or disabilities, a longitudinal study of apprentices, and projects to develop methods to help apprentices cope with transition from school to apprenticeship. Research projects on the organization of vocational/professional education seek to improve teachers' training, to characterize the needs of individuals who try to change their professional activities, and to elaborate and evaluate a curriculum for education in elementary economics. Research on transitions includes projects on homemakers' reentry, technological and organizational changes that influence work, and counseling for farm families. (Questions and answers about vocational education programs in Switzerland are appended.) (YLB)

Current Problems in Vocational Education in Switzerland: Report on a National Research Program

Gerhard Steiner

Occasional Paper No. 93

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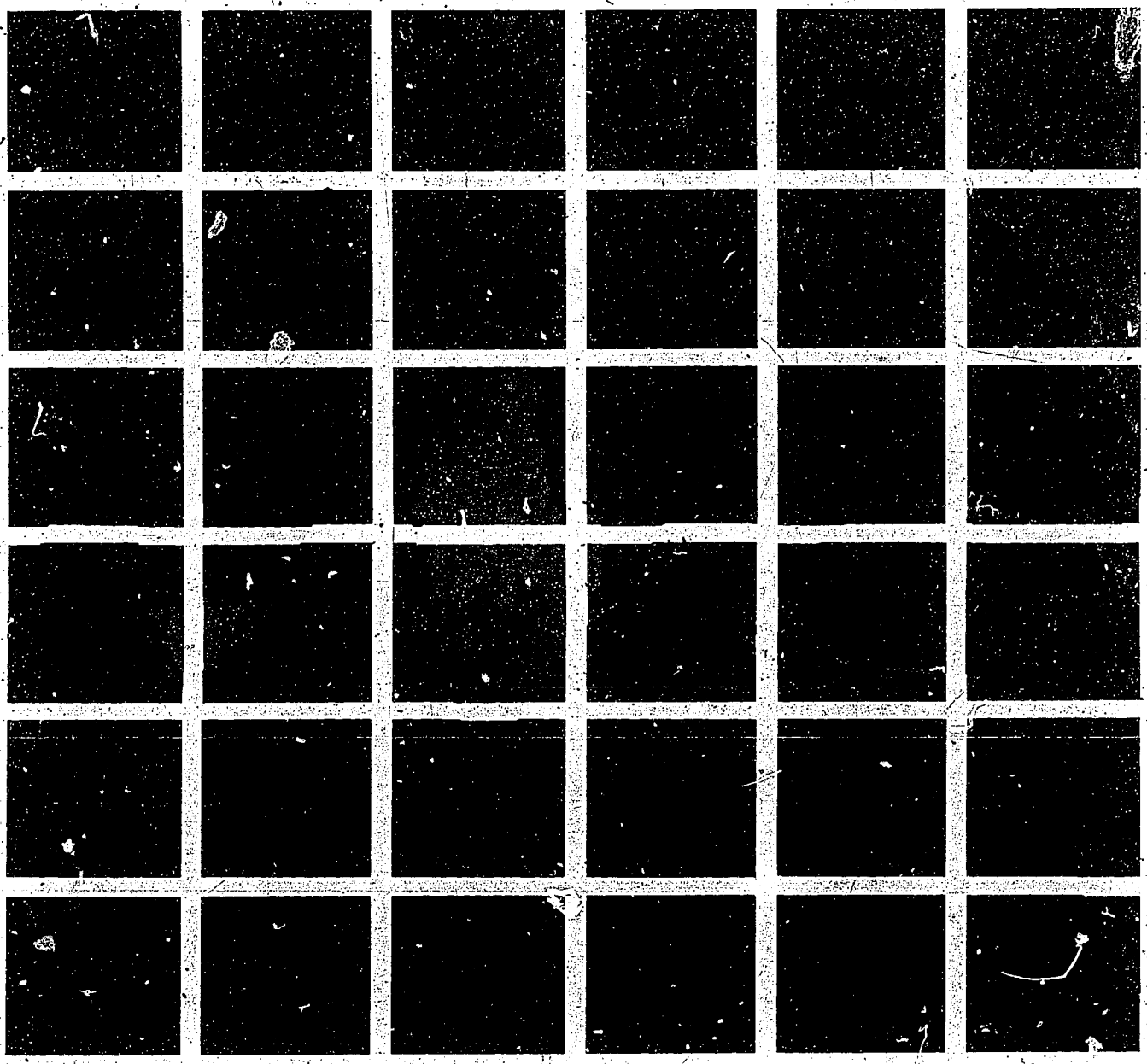

CURRENT PROBLEMS IN VO ONAL EDUCATION IN SWITZERLAND: REPORT ON A NATIONAL RESEARCH PROGRAM

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1983

FOREWORD

The National Center for Research in Vocational Education at The Ohio State University is pleased to present Dr. Gerhard Steiner's remarks on "Current Problems in Vocational Education in Switzerland: Report on a National Longitudinal Research Program." Dr. Steiner, who is Professor and Director of the Department of Psychology at the University of Basel, Basel, Switzerland, delivered his comments to the National Center on November 16, 1982.

Dr. Steiner presents an overview of the vocational education system in Switzerland and the research questions and problems in the system that his country's National Research Program on Vocational Education is addressing. He discusses such important areas of research as (1) the reentry of displaced homemakers into the work force, (2) the improvement of teacher training, (3) the transition from school to work, (4) personality development and attitudes related to work, and (5) technological and organizational changes that affect work.

Dr. Steiner taught school for twelve years at all levels from the primary grades to high school. After he received his Ph.D. in educational psychology he worked as Assistant Professor at the University of Bern (Switzerland) with the university's teacher training program, which also serves teachers of vocational schools. Dr. Steiner has also conducted extensive training programs in the private sector. Since 1977 he has been at the University of Basel, Switzerland. In 1978 he was appointed Director of the National Research Program on Vocational Education, which is a part of the Swiss National Science Foundation.

We take great pride in presenting Dr. Steiner and his lecture on "Current Problems in Vocational Education in Switzerland: Report on a National Research Program."

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

CURRENT PROBLEMS IN VOCATIONAL EDUCATION IN SWITZERLAND: REPORT ON A NATIONAL RESEARCH PROGRAM

Swiss Vocational Education

Vocational education in Switzerland originates in the tradition of old craftsmanship as well as tradesmanship, and closely resembles the vocational education structure of the other German-speaking countries: the Federal Republic of Germany (West Germany) and Austria. Vocational education in the nonacademic professions (i.e., handicrafts as well as trades) takes place mainly in three kinds of institutions:

1. In small laboratories or workshops where a master of trade or crafts (e.g., a master carpenter, plumber, baker, or butcher) has, in addition to other regular employees, one or two *apprentices*;

2. In larger and very large companies (e.g., in the chemical industries, in banking, in the Swiss Post, the Telephone and Telegraph Company, or other federal institutions) where a great number of apprentices are introduced into a certain profession by special trainers (e.g., mechanics, plumbers, or clerks who almost always hold a trade-master's degree);

3. In state or private workshops (special training workshops) where classes of about fifteen apprentices learn their profession isolated from the production process in a company (i.e., without a particular responsibility in the company).

Thus, the educational environment may differ widely for apprentices, even those in the same profession.

Vocational education in the French-speaking part of S[illegible] about 20 percent of the entire population) differs from vocational education in the German-speaking part in that there exists a certain tendency towards the third kind of educational institution for apprentices—the special training workshops. The trend toward the extensive use of these workshops may be based on the idea of promoting greater chances of equal education for members from all socioeconomic groups.

Besides this job-oriented education, every apprentice has to attend courses in a vocational school for at least one full day a week. Apprentices are taught both theoretical topics, such as bookkeeping or language, and practical, profession-specific topics, such as the basic principles of welding.

Apprenticeship can be started after nine years of compulsory school at the minimum age of fifteen, and can last over a period of two to four years (e.g., two years for salespersons, four for an electronics technician), according to the requirements of the particular profession.

In Switzerland, there are about 250 different professions that are approved for apprenticeship training by the Federal Office of Industry and Labor. The Federal Office not only defines what

profession is accepted as such, but also defines the framework for the education required in the profession. Subsequently several professional leagues participate decisively in developing the curricula for education in that profession. The trade unions also have the ability to take a role in decisions on procedures or requirements in vocational education programs.

The preparation for vocational choice (vocational counseling) occurs mainly in the last two years of junior high school for those students who plan to start an apprenticeship. A recent trend for many students is not to go to the "gymnasium" (a senior high school that prepares students for the university), but instead to plan an apprenticeship in a trade or craft.

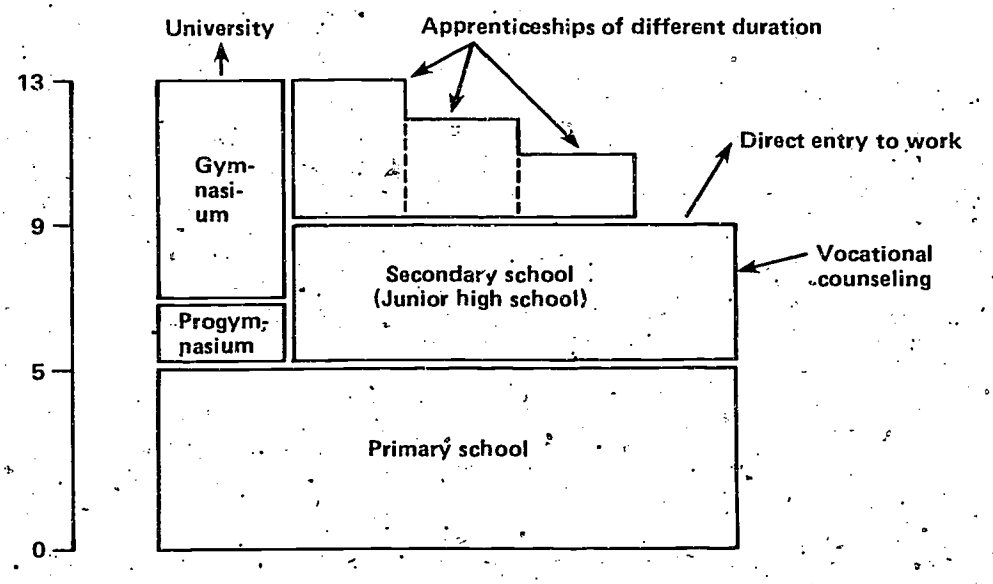

Figure 1. Education system in Switzerland. School education is subject to the law of the "cantons" or states within the Swiss federation; thus there are about twenty different educational systems within the country. Education within the primary and secondary levels lasts for a total of nine compulsory years.

European Research In Vocational Education

One part of preparing the National Research Program (NRP) was the development of a "Trend Report"* on research in vocational education and work life in neighboring countries in order to obtain an overview about the mainstream of recent research. The research topics identified reflect some of the main problems in the professions as well as in the economy of these countries. Most of these same problems will be apparent in Switzerland within the next five to ten years.

The *Trend Report* provides information on some 1,000 recent research projects, divided up according to several different content categories: world of work, education, structure of society, and state and politics (as far as these are concerned with vocational education and work). As

*Born, R., and Steiner, G. *Trend Report on Research in Vocational Education, Mainly in the German-speaking Countries of Europe.* Aarau: Schweizerische Koordinationsstelle fur Bildungsforschung (in German). 1980.

mentioned previously, the report was also intended to uncover certain research needs in neighboring countries to be analyzed in order to anticipate future problems for our country. Figures 2 to 5 show some quantitative results from the *Trend Report*.

On the whole, it can be seen that a strong research effort has been made on topics such as vocational/professional education, adult education (recurrent education), and education for special groups such as women, foreign workers, handicapped people, and ex-offenders. Areas of research emphasis include the humanization of work, technological change, and unemployment.

Another topic, new models for vocational education, is also receiving special emphasis. Research on this topic is particularly aimed at the enhancement of professional mobility, thus raising such questions as: What basic skills are needed for a certain profession? How do we avoid an overemphasis on particular professional specializations? How do we basically reorganize or innovate traditional education in classical professions, such as mechanics?

One outstanding research need seems to be a better coordination of all important aspects of vocational education and work. Therefore, our research questions should be neither too global nor too specific in nature. At the same time they must encompass individual personality, the actual situation of work, and the needs of society.

The next section shows how Swiss research is organized according to these criteria.

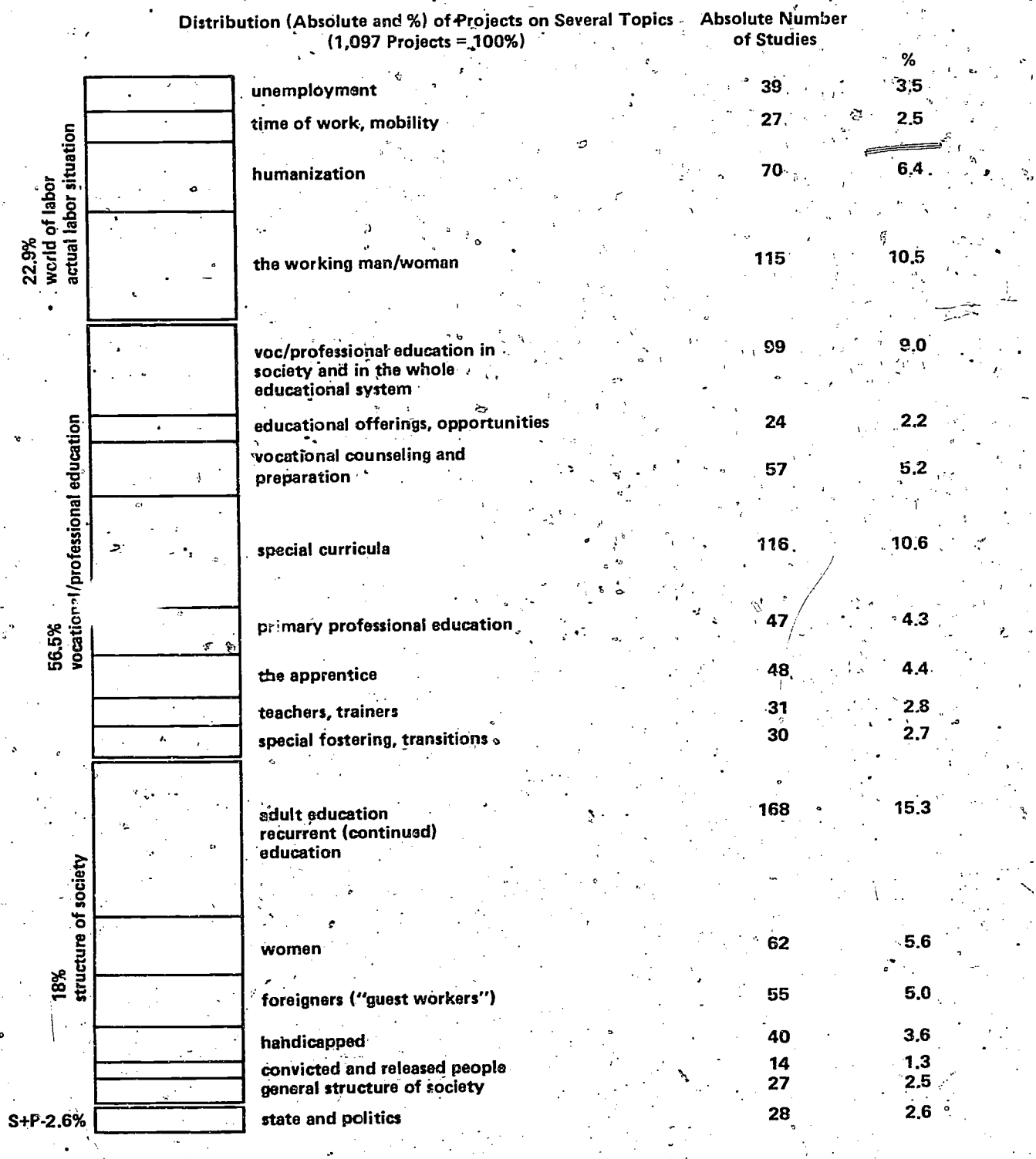

Figure 2. Distribution of recent projects among several classes of topics included in the *Trend Report*.

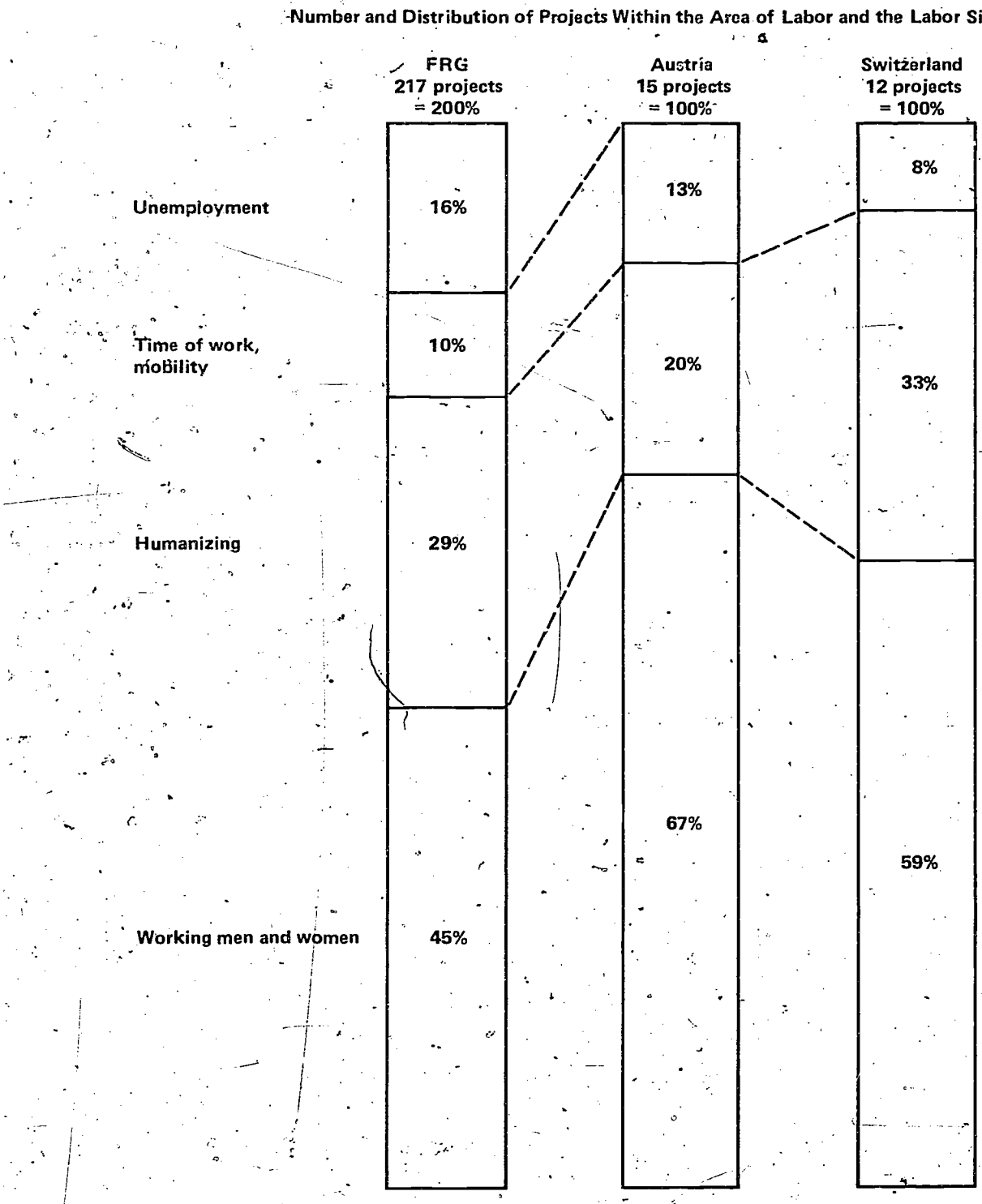

Figure 3. Comparison between three German-speaking countries of number and distribution of projects on topics from the world of labor and the labor situation.

Number and Distribution of Projects Within the Area of Vocational/Professional Education

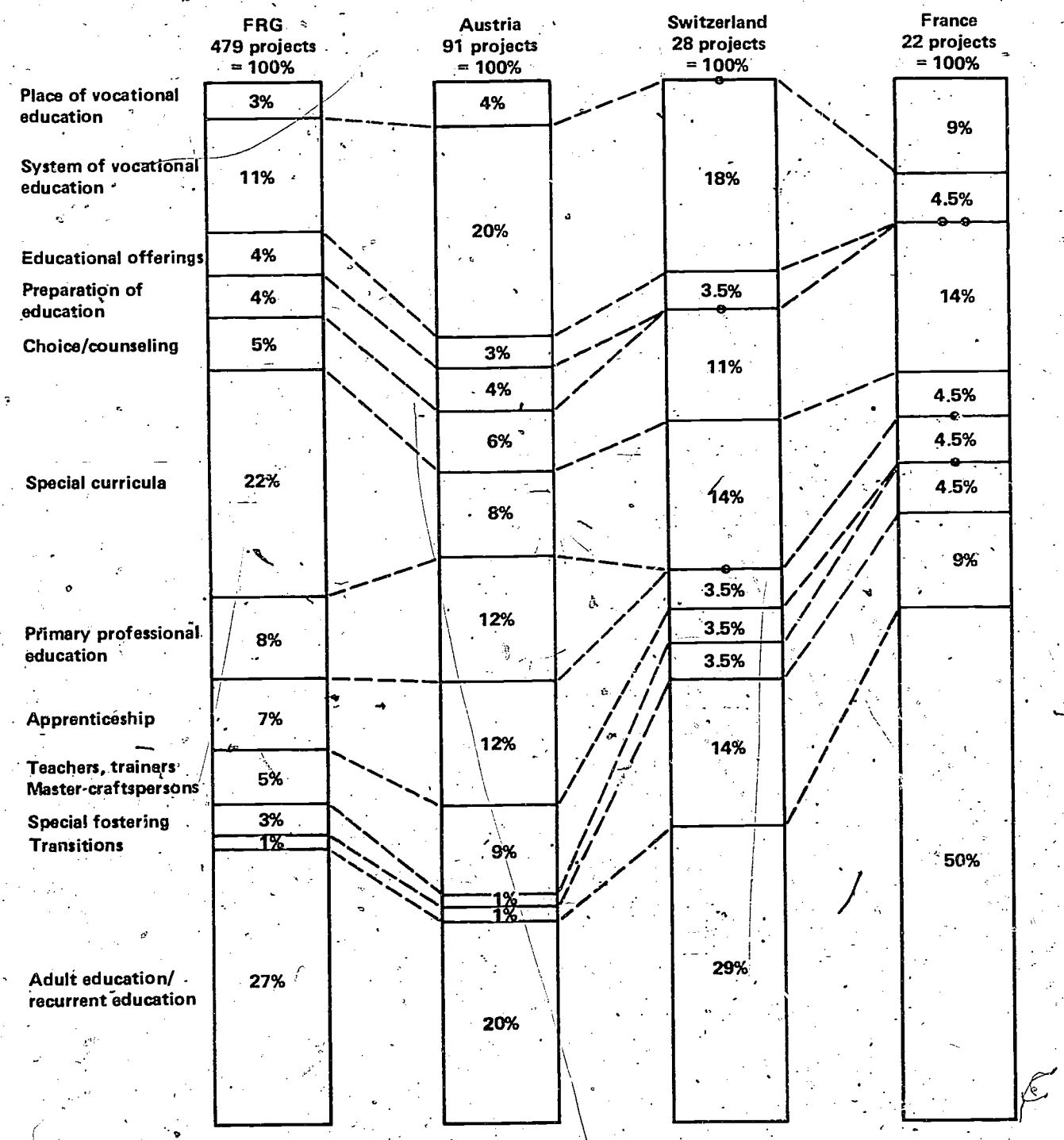

Figure 4. Comparison between West Germany, Austria, Switzerland, and France on projects in the area of vocational/professional education. (Small circles in the columns indicate single projects.)

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Number and Distribution of Projects Within the Area of the Structure of Society

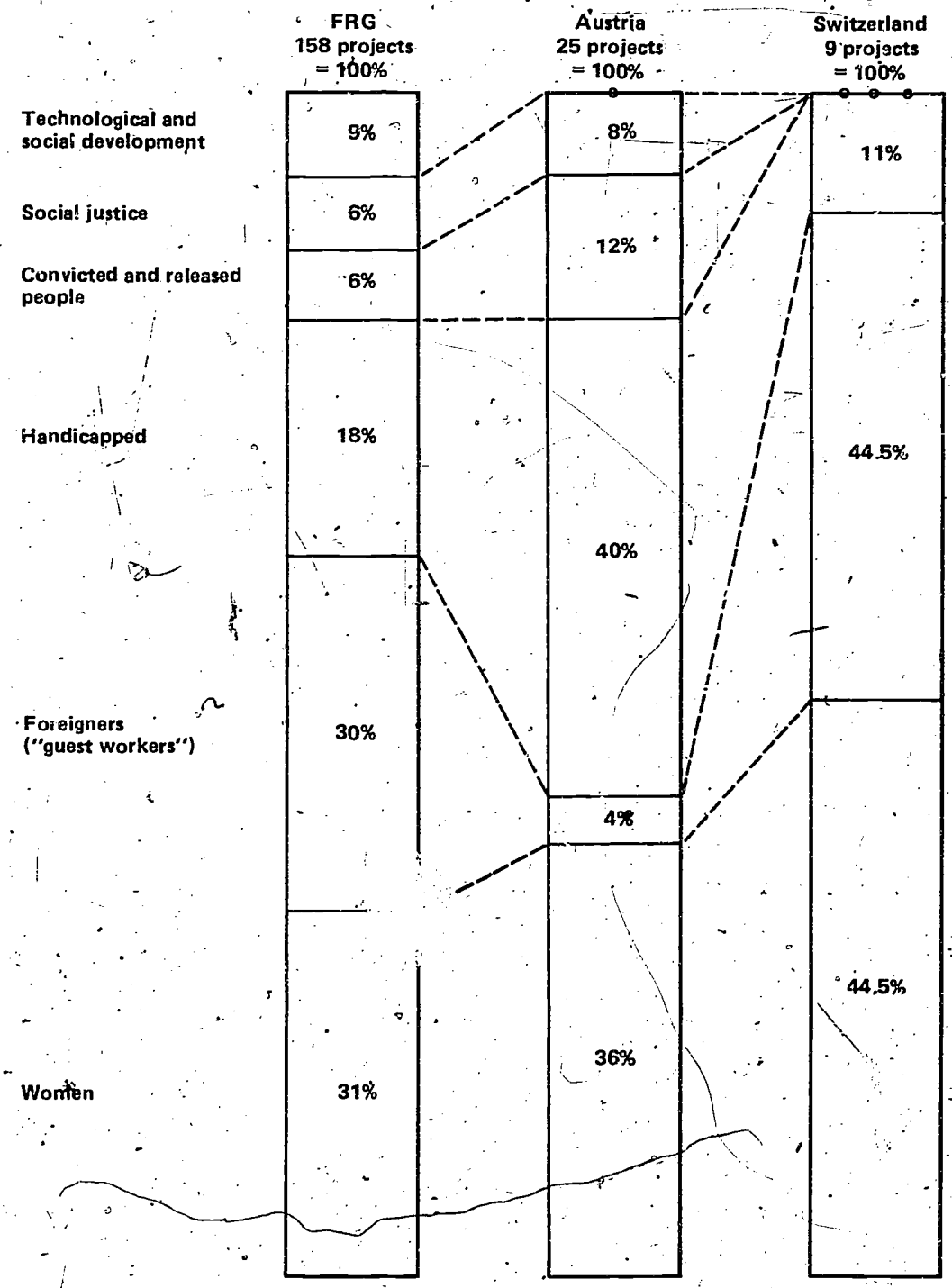

Figure 5. Comparison of projects in the area of structure of the society of West Germany, Austria, Switzerland, and France.

The National Research Program for Vocational Education: "Education et Vie Active"

What Is the National Research Program?

The Swiss National Research Program is a group of particular research projects that are clearly within areas of national importance. Research questions and problems are usually identified by the scientific community (e.g., universities and private research institutions) but also are suggested by public institutions or organizations that are normally not engaged in research (e.g., the Swiss Red Cross). National Research Programs (NRPs) are initiated by the Swiss federal government and are entrusted for realization to Division IV of the Swiss National Science Foundation. Former or current National Research Programs include "Prevention of Cardiovascular Diseases," "Wood as a Source of Energy and Raw Material," "Methods of Preserving Cultural Values," and other topics.

Our National Research Program in vocational education, "EVA" (from the French title "Education et Vie Active" or "Education and Active Life"), focuses on three broad areas in vocational education. The program was developed in conjunction with an execution plan that was formulated by a committee of experts and the director of the National Research Program. All research projects must follow this same execution plan. The three areas within the EVA program are explained in the following.

1. The first area is "Personality Development in Education." The area addresses such questions as: How does the personality of a young man or woman develop under the manifold influences of the educational and work environments? How do apprentices experience the intellectual, physical, social, emotional, and moral requirements that a particular educational situation imposes on them? Answers to these questions are of interest to the administrators of vocational and commercial schools, the government, labor unions, occupational counselors, and to all those who are directly involved in the education of the apprentices (master craftspersons, teachers at vocational schools, instructors at private companies, and so on.) They are also quite important to the apprentices themselves.

2. The second large area of research is "Organization of Vocational Education." In this area, the research questions stem from problems in the development of textbooks, learning and teaching materials, the adaptation of teaching supplies for specific educational needs, or professional requirements for particular activities (such as the activities in health care, social work, etc.). Many institutions, as well as individuals in primary or recurrent education of adults, are interested in this kind of research.

3. The third area is known as "Transitions." Numerous problems with vocational education arise from situations of transition, such as the reentry of women into a professional activity after several years of rearing children and keeping house, the transition of handicapped people from a health or rehabilitation center back to work, and the transition of unemployed or imprisoned persons back to normal life and work.

You may be astonished to hear that unemployment is not a special area in a Swiss National Research Program. The reason for this is that our unemployment rate is still below 1 percent. Of course, we do have to cope with some specialized types of unemployment. For example, federal committees are now devising a means for restructuring the Swiss watch industry. Such restructuring will include the creation of new jobs in industrial sectors close to watchmaking. Such activities, however, go beyond the scope of our NRPs.

Actual Research

Currently, fourteen projects are being conducted under the EVA program: ten of them in the German-speaking part of Switzerland, three in the French part, and one in the Italian part. This distribution is consistent with the approximate percentage of German-, French-, and Italian-speaking people in the country.

After the official announcement of the EVA program in 1978, forty proposals for projects were submitted. After a two-week seminar with all the interested researchers, many of these proposals were revised, rewritten, and submitted as fully developed applications for financial support. Nine of them were accepted in 1979 and started in early 1980. A second series of five additional projects started in early 1982 after the same kind of selection procedure.

Research on Personality Development

The concept of "development" must be taken with two different connotations: first, development in the sense of a change occurring over the years that can be observed and described; second, development in the sense of an actively induced change (e.g., by specific treatments or educational interventions).

Let me first explain a "learning-to-learn" project for apprentices that is especially designed for those with learning problems or disabilities. The project aims at better controlling (1) individual learning techniques, (2) learning readiness or motivation, and (3) the adequateness of behavior vis-a-vis the whole educational situation. The project group is about to develop a learning-to-learn program and to introduce it, with the help of teachers, into vocational schools of different kinds for immediate use in classes or with individual students. Both unions and private companies in the banking and chemical industries are interested in this project and are eager to cooperate with the project group in order to enhance the efficiency and quality of several forms of in-company education.

The learning-to-learn project started with an investigation into the question of "How do apprentices learn spontaneously?" In other words, what do they know about their own learning processes? What do they do when they are about to learn? What motivates them to learn a certain content? What hinders them in learning?

After obtaining more precise information on the work environments of several groups of apprentices, the next research questions were: Is an enhancement of the knowledge about monitoring one's own learning process possible? What learning techniques are useful? How can self-control of learning motivation be obtained? How can learning inhibitions be removed?

This research is organized as an intervention study with four parallel experimental groups and a control group in private companies and in a school for slightly mentally handicapped or retarded students. The methodological procedures are (1) obtaining "thinking aloud" protocols

about the learning process and (2) measuring the behavioral changes from pretest to posttest (i.e., changes after the intervention along the dimensions of learning techniques; monitoring the learning process; planning the learning process; and motivation and anticipation of learning inhibitions).

Three other projects focus on different aspects of personality development. One longitudinal study is being conducted for the whole duration of a normal apprenticeship, from the end of compulsory junior high school (age fifteen) to the transition to work after the end of apprenticeship (age eighteen or nineteen). At several points in time, the students/apprentices/workers have been asked (in structured interviews or through testing by other methods) about the most important personality traits and attitudes involved in education and work. These data will be correlated to the specific features of the different educational environments in small workshops, big factories, or special state-level workshops in order to determine whether certain developments in personality are connected to or can be attributed causally to particular situational factors or characteristics.

The crucial problem in this project has been a methodological one: the refinement of the two dimensions "vocational education" and "personality" and the measurement of these. The relevant dimensions are as follows:

Vocational Education or Training	Personality
• Self-determination of professional activity, and degrees of freedom	• Cognitive abilities
• Public appreciation versus public disdain for activity	• Personal participation versus withdrawal from society
• Chances of developmental changes in a certain profession	• Professional participation versus withdrawal
• Chances of social change through a certain profession	• Unfolding versus limiting the personality
• Focusing of apprenticeship on adequate training contents	• Flexibility versus rigidity of sex role interpretation
	• Image of self; actual and enduring emotional state

The longitudinal study will soon be completed, as most of the apprentices have now made the move into work life.

The two other projects in this group are designed to develop some methods of helping the apprentice cope with his or her transition from school to apprenticeship in an adequate manner. In both cases training programs are introduced and implemented, then evaluated and reintroduced to enhance social competence in solving interpersonal problems or in coping with social-moral conflicts. One form of training is rather a clinical one of the "theme-centered" type, whereas the other form is a type of training for enhancing the apprentice's ability to solve

complex interpersonal problems adequately. Here, the apprentices were trained in groups of six to ten members during a whole week. The training program contained the five following goals:

1. to learn, get acquainted with the use of, and apply certain rules of interpersonal discussion;

2. to enhance the level of social-moral argumentation (by introducing cognitive conflicts through moral dilemmas);

3. to learn about and clarify individual value systems, and to compare the individual's own value with the values of others;

4. to provide training in problem solving as well as solving conflicts in social settings;

5. to focus on what and how things have been learned during the course (metacognition and self-reflection).

These goals were reached by several methods: group discussions; role play; games; instructions about social, psychological, and moral topics through discussion; and written materials. Through such exercises, it can be shown to the apprentices that most of the topics are applicable in real, everyday situations—an insight that has led to an enhancement of learning readiness in terms of the aforementioned goals.

Short-term results indicate that the apprentices who receive this training are better prepared to cope with difficult social situations and to communicate more easily with peers as well as with potential and actual conflict partners. The long-term effect of this training intervention remains to be proved.

Both of these projects are being run in large companies or institutions (e.g., banks), as well as in a school of agricultural education for young farmers. The efforts can be viewed as contributions to the personality development of young people who do not necessarily suffer from an obvious lack of interpersonal skills, but who are still in need of learning an effective way to cope with difficult interpersonal relations and situations in the new environment of apprenticeship—or later, of work.

Research on the Organization of Vocational/Professional Education

Among the four projects executed within the second main area of research in the EVA, the one on "naive educational theories" of future professional teachers at professional schools is most advanced.

The goal of this project is an improvement of professional school teachers' training at the Swiss Institute of Professional Education (a professional teachers' college). All teachers (or more precisely, future teachers) involved in this project are former master craftspersons who wish to become teachers in the area of their former profession at one of the states' professional schools. They attend full-time classes for a whole year. The focus of the project deals with the fact that all of these future teachers already have a naive educational theory that leads their actual teaching behavior. Thus, a teacher training program has to take into account these naive theories from the point where each individual actually is in his or her particular theory. The leading idea of the research group is that missing what the future teachers already know (or believe they know) about teaching means missing an important chance for a good (i.e., effective) education for

them. Instruments are being developed to determine the exact knowledge of the teacher-students, and procedures are being developed to integrate the already present knowledge (naive theories) into the training program.

In order to uncover the naive theory of a teacher-student, the research group uses videotaped classroom teaching exercises, confronts the students with their own teaching, and asks them to interpret their own teaching activities. A classification scheme of naive argumentation as well as interpretation provides the base for the instruments mentioned previously. This study is of utmost importance not only for the nationwide improvement of teachers' training but also for the training of master craftspersons who must, according to a recently established law, attend two classes on educational topics in apprentice training. This requirement has not been enthusiastically received by the active master craftspersons, especially by those who own small firms.

In a comparable way, another study seeks to characterize the needs of individuals who try to change their professional activities (e.g., to enter the health care professions after having worked in a quite different environment). Specific features of the person's educational biography will be classified in a matrix for planning training programs. The study is part of educational endeavors for adults in the Geneva area.

A more classical study includes both the elaboration and evaluation of a curriculum for education in elementary economics in light of different teaching styles. The very interesting point of the study is that about twenty teachers are fully engaged in this action research; they are an integrated part of the development of the curriculum as well as of the evaluation of the short- and long-term effects of training on the students' decisions in solving economic problems. As economic education is part of the compulsory theoretical courses for apprentices in professional schools, it is important to make this education more interesting and effective.

Research on "Transitions"

Reentry into work for mothers/housewives in our country has obviously become a leading trend during the past few years. Since no one knows exactly how many women in Switzerland are intending to go back to work, why they want to return to work, or what kind of work they will seek, research in these areas is quite critical. Why a reentry? What changes in society have occurred during the last years or decades that have had an influence on career development of women? Based on these questions, three hypotheses have been stated:

1. The time during which a mother is engaged in child-rearing has become shorter. Mothers now have fewer children than two or more decades ago. The lifespan after the children grow up and leave home is longer than in past decades, as life expectancy has increased. Average life expectancy is now about seventy-seven years for women and seventy-three years for men. How can this new and longer life-style for women be accommodated? Since this problem is historically rather new, there are few ideas or even norms according to which one could act. Perhaps the reentry into the work world becomes the leading idea to cope with in this situation.

2. Society has certain expectations toward traditional activities of women, but these expectations are obviously undergoing certain changes. Whereas in former times all three roles (the women as wife, housekeeper, and mother) were of about equal importance, today the mother role has become most important. This change implies that the traditional expectations in regard to the post-children phase have become less clear. In this phase, the idea of reentry fills a gap.

3. The actuality of reentry may also have to do with changes in education. It has been shown that those with higher basic education levels take a greater delight and interest in working. The education level of women has risen during the last years as the availability of educational services has expanded. From this viewpoint, the female orientation toward having a profession and working has become stronger. This may lead to the opinion that wives who have abandoned their professional activity for the sake of their family do not observe this state as definite—they have planned their reentry from the beginning.

The project group is about to verify these hypotheses to learn about the particular motivation toward reentry or non-reentry. About 1,500 women are involved in a survey that is enriched with dozens of narrative interviews. The study will provide a representative overview about the reentry problem along several dimensions: the geographic distribution (urban-rural) of the women, the age distribution, the marital status (married, divorced, single), the level of education, etc. A continuing study that focuses on institutions or organizations that help or advise women who are willing to reenter the working world is also being planned.

The remaining research projects in the third area have just started. The project called "Innovation and Qualification" focuses on technological as well as organizational changes that influence work. As technology improves, the importance of direct contacts with the object of work decreases, and the direct experience with the production of certain goods becomes secondary (i.e., it is mediated by such modern technology such as computers, machines, and so forth). In addition, intellectual experiences drive out direct sensory experiences, and the "feeling" for certain materials is replaced by complicated measuring devices and electronic data processing. As the visibility of production procedures fades away, the activity of workers is often narrowed down to a monitoring or watching function. In other words, the impact of practical skills is taken over by cognitive abilities. What are the conditions for the survival of workers in particular professions in the face of such changes? The project can be characterized by the following research questions:

1. How do such innovations/changes influence the worker's current qualifications and his or her ability to obtain new qualifications?

2. What opportunities are available for a worker to learn from those innovations/changes and to adapt his or her qualifications to the altered situation of work?

3. Which determinants in the qualifying process are dependent upon the innovation, and which ones are not?

4. How can the process of changing qualifications be coped with? In particular, how does prework socialization (during apprenticeship) and outside-of-work socialization (private life) help or hinder the change process?

The project seeks to refine professional education in three areas of mechanics toward an enhancement of mobility, higher readiness for change, and increased professional flexibility.

A quite different population is involved in a special study on farm families. National statistics have revealed that in Switzerland, four farms per day were closed or abandoned during the period between 1975 and 1980. In the mountainous regions of the Swiss pre-Alps and Alps, 60 to 70 percent of all farm families depend on a secondary income from outside the farm. One of the goals of our federal farm policy is to reduce the number of farm closings and abandonments

because of the subsequent economic effects. The main goal of the present study is to develop both the foundations and the procedures for a counseling service for those farmers who live in situations that no longer allow a full income from farming. The project's data are being gathered from vocational counseling institutions, vocational and professional education schools (in particular, agricultural schools), and institutions that provide for the recurrent education of adults. In addition, farmers in one wide rural region in central Switzerland (Emmental, where the famous Swiss cheese comes from) are being interviewed on current production methods as well as economic, social-psychological, and institutional problems they encounter during the transition from one type of farm managment to another (i.e., during the structural adaptation phase).

A special study in the Geneva area deals with the reasons for the many dissolutions of apprenticeship contracts. Of 4,000 contracts, there have been 700 dissolutions within the past two years. Knowing more about the reasons for these dissolutions may help the vocational counselors as well as other persons involved in planning and executing apprenticeships prevent such incidents.

An extended survey over the French- and German-speaking parts of Switzerland asks for exact information about the vocational/professional fate of the second generation of guest workers, who are workers who do not obtain Swiss citizenship. At the age of sixteen, only 30 percent of all Italian and Spanish children whose parents are living and working in Switzerland get a professional education, whereas 48 percent of the Swiss sixteen-year-olds start a professional education.

All fourteen research projects are being conducted at the same time that the research group is in direct contact with particular individuals engaged directly in vocational/professional education, with individuals affiliated with the federal or the state governments, with labor unions, and with professional schools or institutions that carry out training on their own (e.g., the Red Cross). These connections, with numerous personal links between scientists and practitioners, are intended to form the unrenunciable foundation for the implementation of the research results after the EVA program has been completed.

ACKNOWLEDGEMENT: I wish to thank Regina Born as well as all members of the research project groups who have provided me with information on European research trends and their current research, respectively. I also greatly appreciated the comments by Daniel Villiger and Charles Baechler on an earlier draft of this paper. The work on this presentation was supported by grant No. 4.261.0.78.10 of the Swiss National Science Foundation.

QUESTIONS AND ANSWERS

Gerhard Steiner

Question: I've heard that "moral education" is also part of the educational curriculum in your country. Could you explain just what such education encompasses?

The Kohlberg-type of moral education as taught in Switzerland deals with the so-called "social-moral" dilemmas. Here's an example. Your mother is quite ill, and you know that the pharmacist has the medicine to cure her. When you get to the pharmacist's shop, however, you find that you simply can't afford the medicine. You then borrow money from all of your friends, but it's still not enough. Hoping that the pharmacist will be sympathetic because your mother is so ill, you tell the person that this is all the money you have. But the pharmacist still won't give you the medicine. The dilemma is now whether you should give up trying to get the medicine or break into the store. You are caught in the social-moral situation of continuing to let your mother suffer or committing a crime in order to help her.

Question: Is such moral education common within the vocational curriculum?

As you may well imagine, many such social-moral dilemmas arise within the everyday work in a company. One way to prepare the employees for such situations is to discuss the development of social-moral thinking and judgment while you are also teaching them a job-related task, such as how to operate a certain piece of equipment. Over time, these small doses of moral instruction not only help the employees identify a social-moral situation in the work place, but also transfer this knowledge into other settings. Admittedly, this type of education is just a small part of our vocational education curricula, but it is a very important one.

Question: What is the time frame for the projects that you discussed in your presentation?

All of the projects are either currently operating, or will be finished within the next two years.

Question: Are all of the projects in your NRP conducted by one institution?

Actually, the projects are conducted by a number of different institutions. Although most of them are run by university project groups, some are also run by other organizations or private persons (e.g., former professional counselors).

Question: How do you decide whether your research should take a national or European emphasis?

As I mentioned, many of the research topics identified in the Trend Report reflect problems that are not now apparent in Switzerland, but that may appear within the next few years.

Unemployment is a good example of this. Thus our research takes both national and European emphases. We also try to pay attention to the other topics that surface while we're working on current projects. For example, right now we have many projects on teacher training, but these projects are for teachers who teach in *schools*—not in the workshop. Thus we're in need of a project to deal with the training and preparation of our master craftspersons. We're planning such a project right now at my own institute.

Question: What kinds of problems do you have in the dissemination of your research results? Since three different languages are spoken in your country, does this mean that all your work has to be translated into all of these languages?

Dissemination presents what is a rather difficult situation for us. From a U.S perspective, Switzerland looks like one small country. Actually, there are rather large social gaps in the country because of the language difficulties between the German-and French-speaking parts. You must speak to people in their mother tongue to get access to their problems. Thus, although it is extremely expensive to translate everything into French and German, we do this because it is very important to have cooperation within the country. Luckily, most of the Italian-speaking citizens know either German or French; thus we don't have to translate into a third language.

Question: Why would a master craftsperson want to become a professional teacher? In this country, such a move won't guarantee you either more money or more prestige.

For such people in our country, the main reasons are (1) an interest in teaching, and (2) security. Five to six years ago, many of these people faced hard times because it was difficult to find work. Thus teaching is a more constant source of employment. In addition, unless the person owned his or her own company, they would probably make more money as a teacher than they would as an employee of a large company.

Question: I'd like to refer to your comments on the areas of research emphasis. What does the "humanization of work" area that you mentioned focus on?

A project in this area may deal with learning how to cope with difficult social interaction situations on the job. Others may deal with the effects of different work environments (e.g., a small room versus a huge workshop) on production efficiency and work attitudes. Actually, we're beginning to focus more and more on this latter type of project because our panel of experts has recognized the need for a totally new and separate national research program on human nature and the work place. Thus, in the future, we'll probably be focusing on how to make work more convenient for the worker. We'll be looking, for example, at how to make the job of someone who sits in front of a computer all day (i.e., a banker) more "real."

Question: What is the situation in Switzerland regarding sex equity in vocational education at your secondary level? Is your government taking any special actions to promote equity?

As in many other countries, we are making progress toward sex equity in vocational education, but we're not quite there yet. I do think, however, that the situation is improving constantly.

To answer the second part of your question, the government does not promote any special sex equity activities because it's not necessary. Job choice is simply left to the individual. For example, suppose a young girl wanted to be a carpenter. Her father may say, "You know that carpenters don't make a lot of money, and it's a hard profession. Maybe you shouldn't do that." He may also mention that it is not easy in their village for a girl to find an apprentice position in a carpenter shop. Thus she may have to look in several different villages for a position. If she insists, however, the father would probably agree to her choice. Right now, however, you seldom find girls in carpenter or plumber workshops. In the United States, girls seem to be a bit further ahead in this regard. For our country, I think the equity process will require at least another five or ten years.

Question: Your brief discussion on studies in technological change mentions several items. Are you far enough along to talk a little bit more about what kinds of future qualifications the workers are looking at?

The projects are set up in the following way. The researchers will conduct interviews with what we call "fine" mechanics, or those persons who work on very sophisticated equipment. These persons are usually considered quite successful in their careers since they have progressed through a number of increasingly difficult jobs and have such a high degree of technical knowledge. The researchers will then be looking at questions such as, "What personal decisions were made when the person decided to change his or her professional activity? What made the person want to move in a different direction toward a higher position? How did the person develop the flexibility needed for changing to and succeeding in each new job?" Basically, we'll be conducting a sort of retrospective investigation into the biographies of a dozen or so different types of mechanics.

Question: You mentioned that new technology tends to move the technical-level worker away from familiar artifacts on his or her job. Do you see the same kind of thing happening to the professional worker as more and more technology makes critical information available to more people throughout the organization?

Given our present trend toward research on work and job satisfaction, we will probably move into this type of research in the near future. At the present time, however, we don't have any projects that deal with such questions. My guess is that professional workers would probably need stronger personalities in the face of such technological changes.

Question: Your country relies primarily upon private employers to provide skill training. Are they required to provide such training, or are they given financial incentives to provide it?

The companies respond whenever the government expresses a national need to expand training opportunities. It's simply an astonishing relationship. Here's an example. Two or three years ago we had too many students apply for apprentice positions in several professions. If these extra students would not have been placed, we would have developed a severe youth unemployment problem. All small, mid-size, as well as large companies in the country were then asked to open their doors and provide two or three additional apprentice positions—a request they readily agreed to.

Question: Since the International Labor Organization's headquarters is in Geneva, do you work with the ILO on any of this research?

We shall certainly have official contacts as soon as the first results of our NRP are out that could be of international importance.

Question: One of the problems that we have to deal with when conducting research in this country is data collection. We have to protect the human subjects' privacy. That stretches out our research time and makes some research virtually impossible. Do you have a similar situation in your country?

It's exactly the same. One of my duties as director of the program is to write letters to governmental decision makers to explain to them why we need the data. Most of the time they agree to our request. Sometimes, however, we do run into problems.

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