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ABSTRACT

The Soviet Union has no efficient system of vocational training that provides adequate levels of knowledge for specialists working with new techniques and new technologies. General secondary school graduates with no preliminary vocational education become engineers. Secondary vocational graduates lack the opportunity to continue their education in the high technical schools. Perestroika of high, vocational, and secondary general education demands the foundation of a flexible system of vocational training, related to the requirements of the society, for specialists in different occupational areas. A pedagogical system based on research would prevent a situation in which the system of training lags behind the technical and technological development. The main goal of such research is to solve complex problems using systematic principles. The city of Tomsk (U.S.S.R.) is leading the way in the vocational reform movement. New forms of intensive vocational education and training have been worked out and approved. Curricula of general, vocational, and high schools are linked through flexible programs. Experimental research has focused on problems associated with intensive training of specialists under the present conditions of cooperation and interaction among schools and business. The need to strengthen the polytechnical content of general subjects and to improve the preparation of teachers has been noted. (YLB)

Vocational Training of Specialists within the Soviet Union

Michael P. Paljanov

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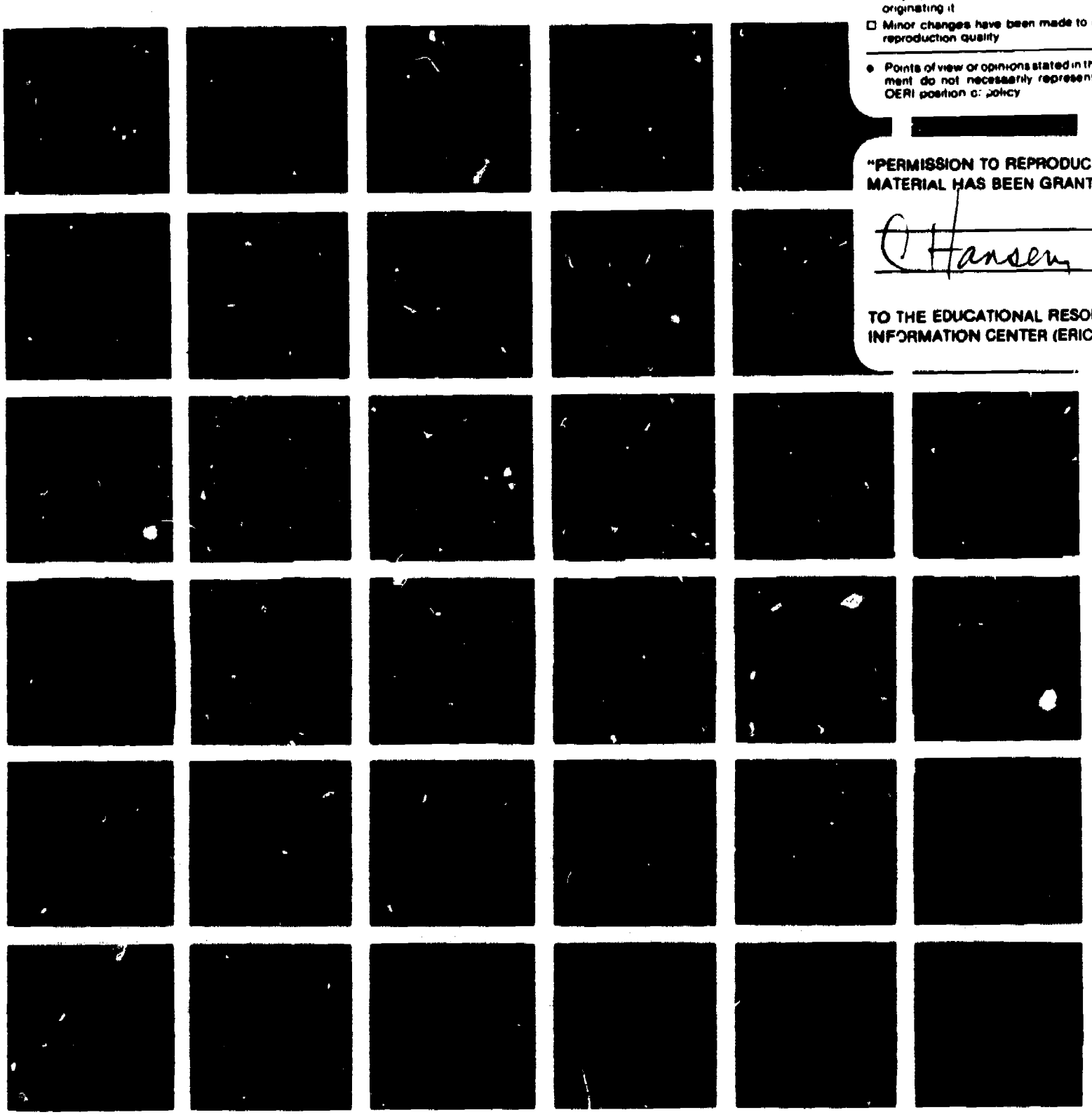

Occasional Paper No. 129

VOCATIONAL TRAINING OF SPECIALISTS WITHIN THE SOVIET UNION REGARDING NEW TECHNIQUES AND NEW TECHNOLOGIES

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Mission Statement

The mission of the Center on Education and Training for Employment is to facilitate the career and occupational preparation and advancement of youth and adults.

The Center fulfills its mission by conducting applied research and using the full range of resources of The Ohio State University in evaluation studies and by providing leadership development, technical assistance, and information services that pertain to—

- the delivery of education and training for work;
- the quality and outcomes of education and training for employment;
- the quality and nature of partnerships with education, business, industry, and labor;
- an opportunity for persons in at-risk situations to succeed in education, training, and work environments;
- the short- and long-range planning for education and training agencies; and
- approaches to enhance economic development and job creation.

FOREWORD

The development of a market economy in the Soviet Union is providing numerous challenges within the country. Many of these challenges relate to establishment of business/industry enterprises and training of a productive workforce. In December 1990, Dr. Michael Paljanov addressed these concerns at a seminar held at the Center on Education and Training for Employment. He was joined by his associates Dr. Anna Malysheva and Dr. Joseph Yankelevich. Dr. Alexey Pankin, Leading Inspector, USSR Academy of Pedagogical Sciences, also participated in the presentation.

Dr. Paljanov is currently the director of the Tomsk Branch of the Research Institute on Vocational Training and Professional Orientation, USSR Academy of Pedagogical Sciences. He holds the degree of doctor of pedagogical science

A specialist in the fields of education and professional training, Dr Paljanov has taught in the secondary schools and at the Tomsk Pedagogical Institute. He has also served as head of the Faculty of Pedagogics and Psychology, Tomsk Pedagogical Institute, and as a researcher at the Research Institute of General Pedagogics, USSR Academy of Pedagogical Sciences

Dr. Paljanov's publications include Comprehensive Development of Pupils, Connection of Education with Productive Work in Secondary Schools, and Vocational Training of Upper Level Students Preparing for Productive Work.

Currently, Dr. Paljanov is engaged in research relating to intensive training of specialists in the new techniques and technologies required by current and emerging enterprises. This includes the exploration of new forms and methods of youth vocational training.

It is a privilege to share with you Dr. Paljanov's views on secondary education in the Soviet Union now and in the future.

Ray D. Ryan Jr.
Executive Director

"Vocational Training of Specialists
Within the Soviet Union Regarding
New Techniques and Technologies"

Until recently in the USSR, there was no special joint research into the problem of providing specialists with intensive training in new techniques and new technologies relating to the needs of enterprises (businesses) and institutes of education.

The importance of elaborating upon the complex problem of training specialists in the modern period of scientific-technical progress advancements is underscored by recent changes in the governmental structure of the Soviet Union regarding educational and vocational training. Until now, there has been no efficient system of vocational training that provides adequate levels of knowledge for specialists working with new techniques and new technologies. In our country; the established structure and content of general education could hardly achieve the goals of modern vocational training.

At the present time, a large majority of general school graduates enter the high schools. Nearly 70 percent of upper-form pupils who don't participate in vocational education enroll in high technical schools. Consequently, only 30 percent of general secondary school graduates can be expected to make informed career choices. The secondary vocational schools are primarily concerned with preparing their students for occupations that do not require high education (five years' secondary education). Only 5 percent of secondary vocational school graduates enroll in the technical high schools. (See figures 1 and 2 for information concerning the structure of the traditional school system.)

Thus, on the one hand, general secondary school graduates who do not have any preliminary vocational education become engineers. On the other hand, secondary vocational graduates lack the opportunity to continue their education in the high technical schools.

It's a paradox. When we need workers with high professional qualifications (according to the purposes of the new economic policy); secondary school graduates are not ready to make deliberate choices concerning their future occupations. Also, the upper-form students don't understand their individual psychological and psycho-physiological characteristics, mechanisms, and driving forces of personality as these factors relate to vocational development.

Under such conditions, the content of general and polytechnical education and vocational training does not reflect

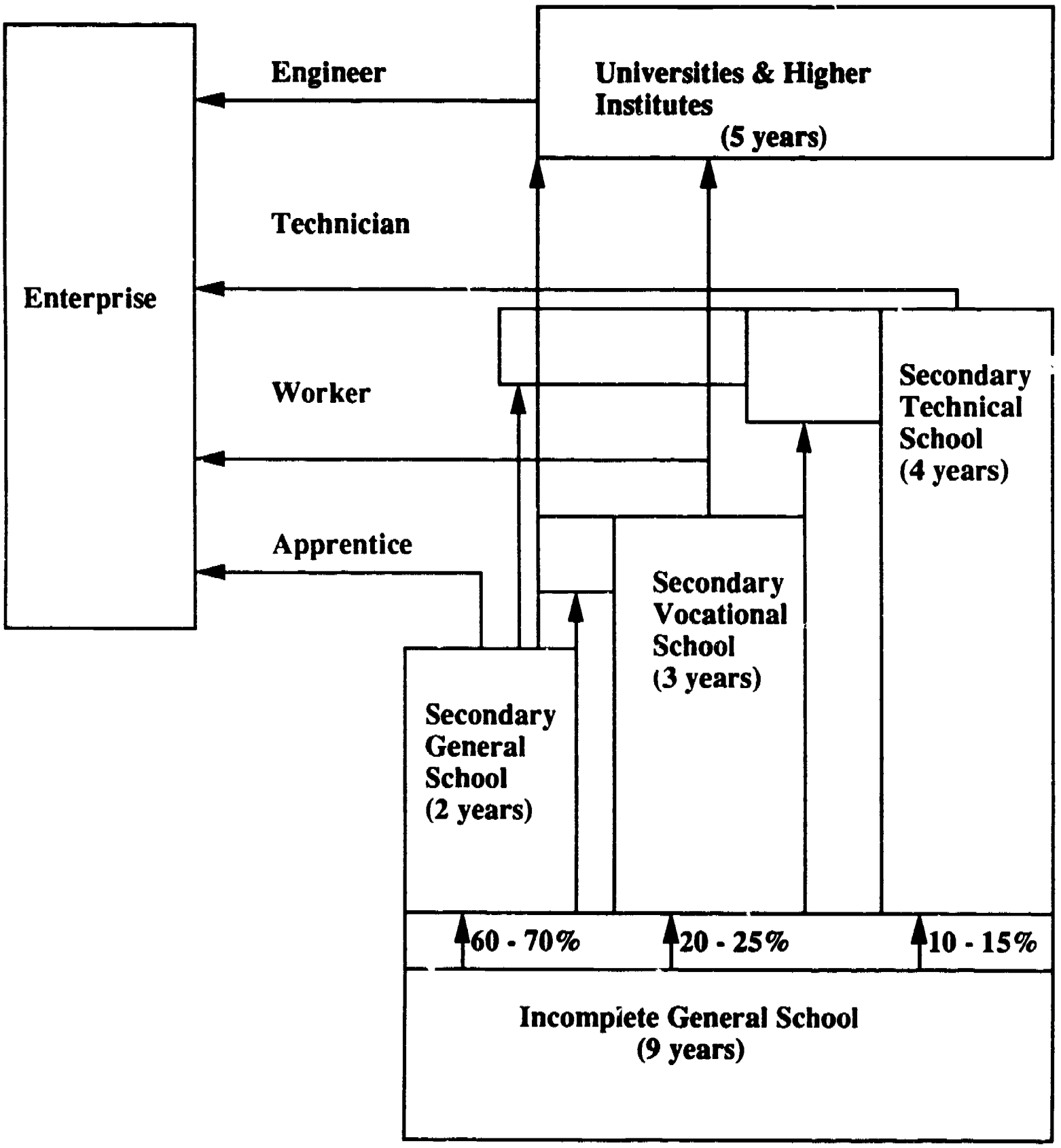

Figure 1. Traditional system of training personnel

Subjects

1. Russian
2. Literature
3. History
4. Social Studies
5. Government
6. Geography
7. Chemistry
8. Physics
9. Math
10. Biology
11. Calculating
12. Vocational (Occupational) Guidance
13. Basics of Production
14. Foreign Language
15. Physical Culture
16. Military Education
17. Economics
18. Techniques of Security
19. Drawing (Drafting)
20. Basics of Technology
21. Vocational Education
22. Practice (Work) in Enterprises
23.)
24.) Special Subjects (Metal Processing, Radioelectronic, etc.)
25.)

Academic/Vocational Correlation

55% = Academic Education

25% = Theoretical Vocational Education

20% = Vocational Training

Figure 2. Secondary vocational school subjects and correlation between academic and vocational education.

technological and organizational innovations in industry.

Perestroika (restructuring) of high, vocational, and secondary general education demands the foundation of a flexible system of vocational training, related to the requirements of the society, for specialists in different occupational areas. It is necessary to create optimum conditions for students' personal and vocational development and to prepare them to make deliberate choices regarding their future occupations. In this case, we can speak about creating vocational education programs that include opportunities for additional specialization within the permanent educational system.

The creation of a pedagogical system based on the use of a flexible curricula throughout our programs should take place through scientific research. The conceptual basis for this work is the provision of continuity and permanence for general and polytechnical education, as well as the integration of educational content.

The investigation of the problems inherent in the present vocational training system should be based on the principle of preventing a situation in which the system of training lags behind the technical and technological development. The main goal of such research is to solve complex problems using systematic principle. Different aspects of vocational training problems (organizational, methodical, psycho-professional, social, economical) are to be investigated.

The main idea of the research is as follows: For the first time in our country, the approach to the training of specialists will be devised as a unified system of general, polytechnical, and vocational permanent education, which will be characterized by its own independent goals, objectives, principles, flexible curricula, thorough programs, methods, forms, and media. In connection with this fact, it is necessary to prevent isolated and uninformed students from being allowed to choose education in secondary, vocational, technical, and high schools until they have demonstrated an adequate understanding of the available educational options.

One of the cities that will lead the way in this vocational reform movement is Tomsk. Tomsk is an ancient Siberian town situated on the bank of the river Tom. It was founded in 1604 as a merchant trade center. Tomsk is a large scientific and cultural center in Siberia; the first Siberian University was opened there. Today, there are seven high institutes in our town.

The Tomsk Branch of The Research Institute of Labour Training and Vocational Guidance; USSR Academy of Pedagogical Sciences, was founded in 1988. It consists of four scientific

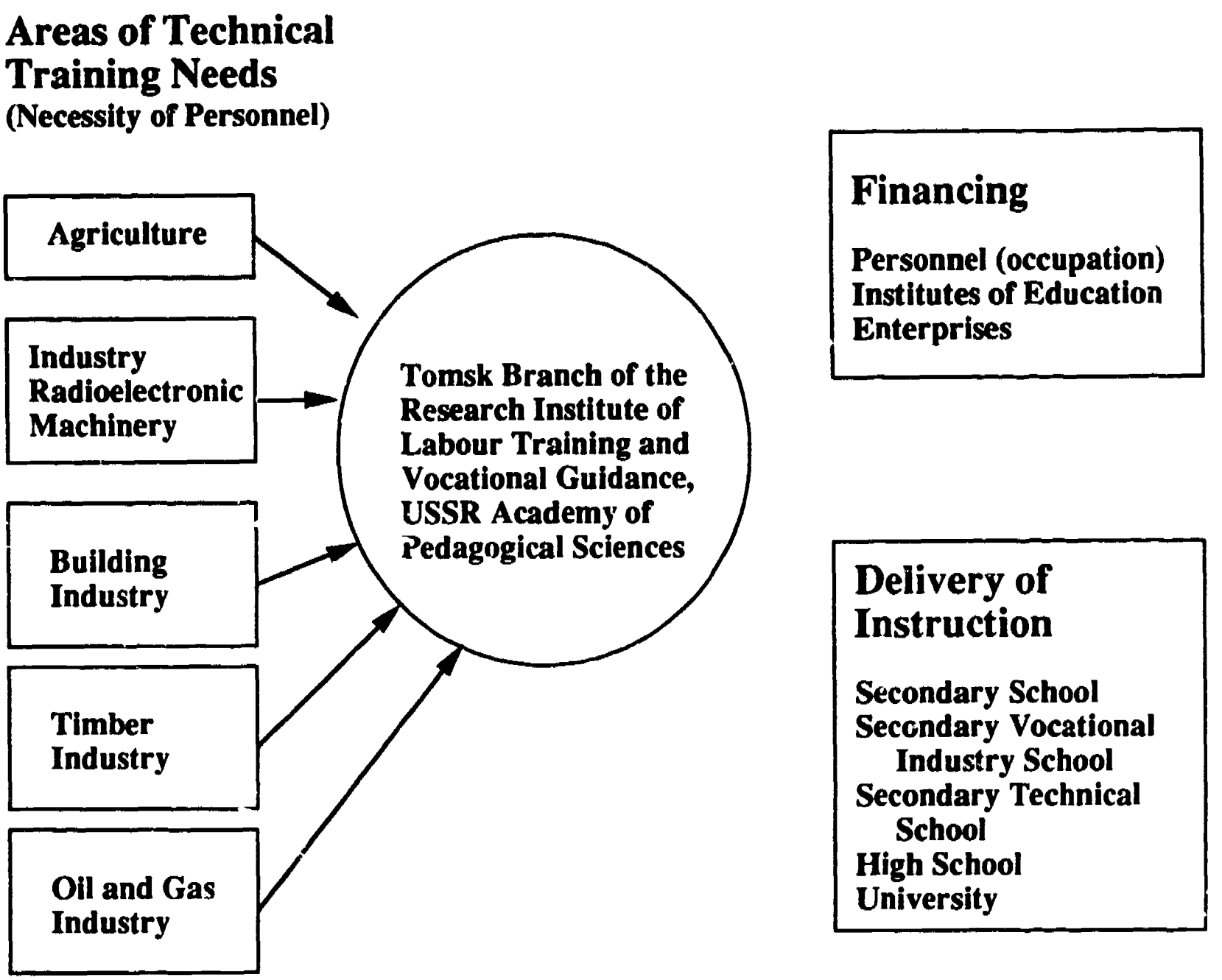

Figure 3. Vocational education in Tomsk

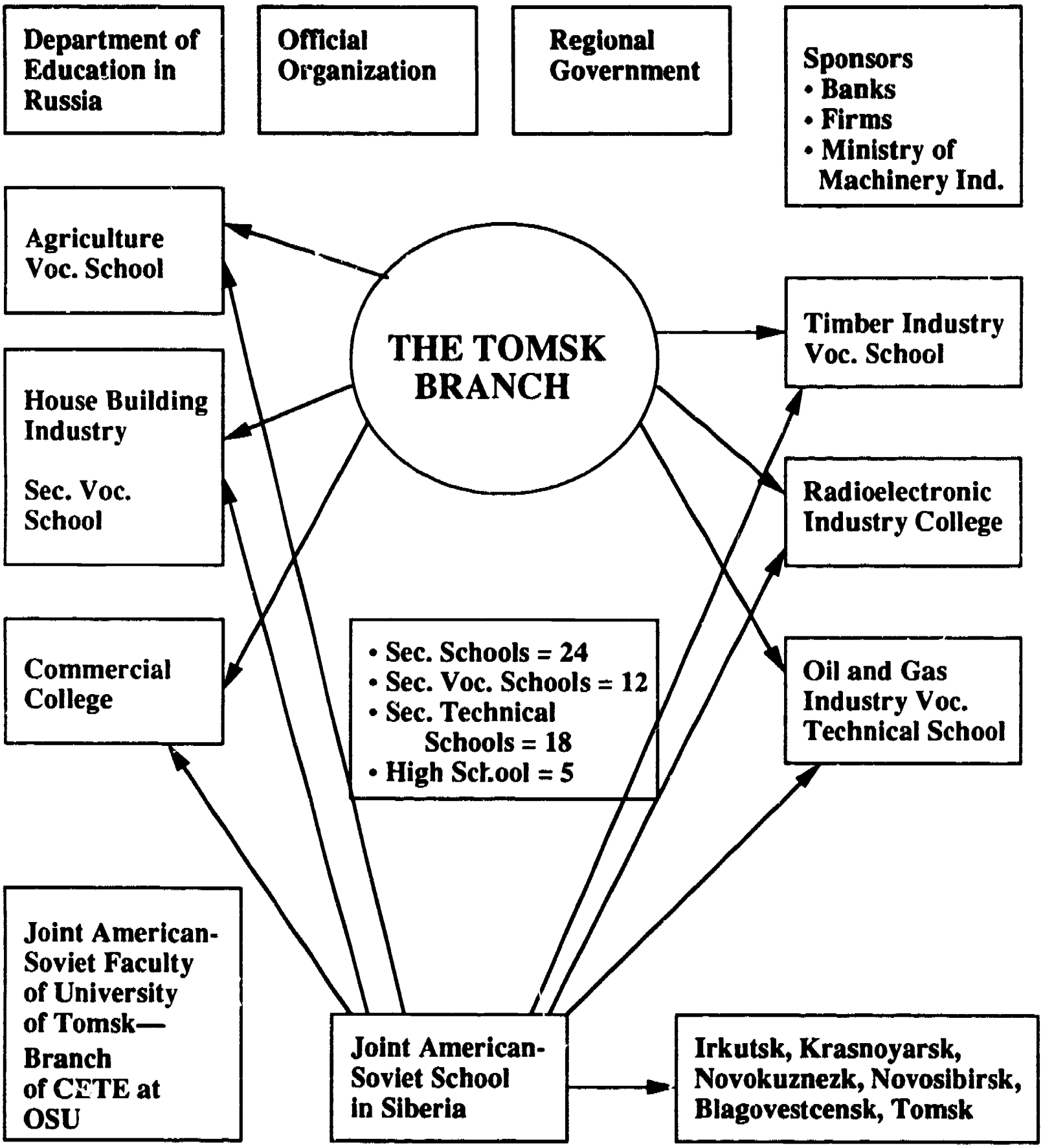

Figure 4. Coordination of Tomsk Institute's Program

research groups in Tomsk and several research groups in other Siberian cities and towns such as Novosibirsk, Irkutsk, Krasnoyarsk, and Blagoveschensk (see figures 3 and 4). Three of these research groups are financed by the USSR Academy of Pedagogical Sciences; the other research groups are financed on the basis of managerial agreements with business/industry enterprises.

The Tomsk Branch serves the needs of science and practice. Branch researchers have developed a wide range of products designed for all levels of vocational education. These products come in a variety of forms: research reports, thorough and flexible programs, handbooks for teachers and students, etc.

Using preliminary results, new forms of intensive vocational education and training have been worked out and approved by the Tomsk Branch in general secondary schools, secondary vocational schools, and high schools. Educational-scientific-industrial complexes are located in other Siberian districts as well. They unite kindergartens, general secondary schools, and vocational secondary schools with separate high school faculties and business/industry enterprises. In these forms, new intensive methodology is used, and the curricula of general, vocational, and high schools are linked thorough flexible programs. (A graphic depiction of the experimental system scheme is provided in figures 5 and 6.)

The new branch of the USSR Academy of Pedagogical Sciences in Tomsk coordinates its work with other available scientific resources, including the Tomsk Branch of the Siberian Department of the USSR Academy of Sciences, the Tomsk Siberian Center of the USSR Medical Academy, and a large network of high schools.

Using this approach, we have been able to conduct some experimental research. Investigations have focused on the problems associated with the intensive training of specialists under the present conditions of cooperation and interaction among the secondary general schools, secondary vocational schools, secondary technical schools, high schools, and business/industry enterprises and of the institutes of education. These experimental research efforts helped to solidify the main direction of the elaboration of concerns such as the following:

- Creating flexible curricula and thorough programs for general secondary vocational schools and high schools that are the basis for students' permanent education and specialization (e.g., occupational areas such as radio electronics, metal-working, and metallurgical work

- Working out intensive forms and methods of vocational training such as vocational education classes, classes

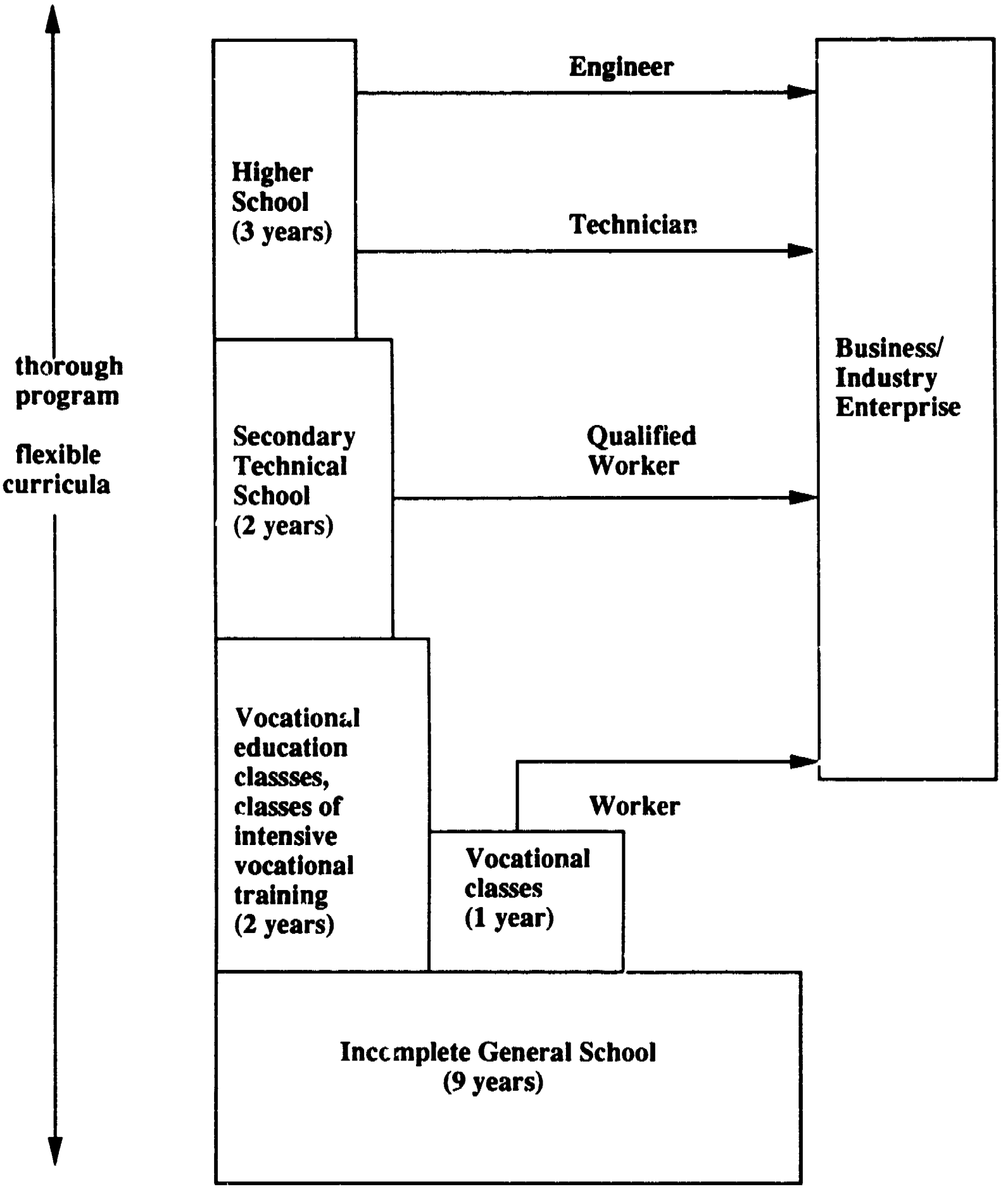

Figure 5. Experimental system of training personnel

I. Basic Block	**Math** **Sciences** **Literature** **History** **English** **Calculating**	**18 hours** **(3 days a week)**
II. Occupational	**Technical** **Technology** **Economics** **Professional Education** **Practice on Enterprises**	**6-12 hours** **(1 or 2 days a week)**
III. Electives	**Physics** **Math** **Chemistry** **Radioelectronic** **Driving, car equipment, service** **History** **English** **10-15 subjects**	**12 hours** **(2 days a week)**

Figure 6. Vocational school study-program schedule

of intensive vocational training, and modularized classes (vocational education classes with further specialization in different occupation areas

- Providing psycho-professional student diagnostics that aim at the selection of to the vocational education classes with further psychological assessment

- Establishing principles of selecting and contrasting curricula for general, polytechnical, and vocational education that aim at training young people for work using new technique and new technologies

- Introducing calculators, computers, and different kinds of technical media for teaching in our system of education

- Increasing the quality and economical efficiency of qualified workers' training for enterprises that are introducing new technologies

- Preparing for the integration of such courses as Society and Man, mathematics, The Modern Techniques and Technologies in Industry, Organization and Economy in Industry, Ecology and Scientific-Technical Progress.

- Developing textbooks for teachers and students, notebooks for students, and different learning blocks from which students can choose

- Gathering experiential data on students' attitudes toward education, work, and decision making regarding their future career choices. Experimental results show that the majority of students change their attitudes about vocational training; e.g., changing labor education from negative to positive. On the one hand, many vocational graduates work in base enterprises; on the other hand, students look forward to continuing their vocational education with the cooperation of business/industry enterprises.

Having carried out this research, it is easy to notice the need to strengthen the polytechnical content of general subjects and to improve the preparation of the schools' teachers. Other questions that need to be asked include the following:

- What is the economical effect of the supported system of training workers?

- In what kinds of occupations do vocational graduates work?

- What effect does vocational education have on ability development?
- Are graduates of vocational education classes satisfied with the jobs they obtain?
- Do business/industry enterprises feel satisfied with the training received by vocational education students?
- What effect does vocational education have on further education and training?
- What effect does vocational education have on the development of values, self-esteem, and citizenship

These questions are frequently asked but are still unanswered. I think the answers can provide a wide basis for scientific agreement.

Today we have such a situation in which it is possible to organize temporary international creative work groups through use of current information technologies. At the same time, we can share the great experience of creating programs, new forms of intensive training, integrative courses, methods of selection, psycho-professional diagnostics of pupils, etc. There are also good opportunities for the interchange of instructional media and personal computers between different countries in the world.

We have the opportunity to organize international seminars in Siberia (March and August 1990, Irkutsk; July 1990; Krasnoyarsk). From these efforts, we hope to organize scientific tourism and to create a new type of vocational school (joint Soviet-American vocational college). Plans call for these schools to be created in Tomsk or Irkutsk. Our goal for the immediate future is to develop specialists for joint enterprises that will be beneficial for everyone involved.

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