The engineering of vocational and technical training

Québec

Part 1

Government orientations, policies and structures

Part 2

The central management of training

Part 3

Program development

Part 4

Program implementation at the local level

For purposes of consistency, the original format has been maintained. Thus, the document contains four parts, each of which includes a detailed description of one of the major components of the engineering of vocational and technical training, as well as reference cards illustrating the content of each part.

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PRODUCTION TEAM

DESIGN AND SUPERVISION

Serge Côté
Director general
Direction générale des programmes et du développement
Secteur de la formation professionnelle et technique et de la formation continue

CONTENT DEVELOPMENT

Serge Côté
Director general
Direction générale des programmes et du développement
Secteur de la formation professionnelle et technique et de la formation continue

Denis Laroche
International cooperation coordinator
Direction générale des programmes et du développement
Secteur de la formation professionnelle et technique et de la formation continue

André Blanchet
Director of planning and development
Direction générale des programmes et du développement
Secteur de la formation professionnelle et technique et de la formation continue

Manon Paquette
Education consultant
Collège Mérici

Berthe Bernatchez
Director
Direction de la formation professionnelle et de l'éducation des adultes
Commission scolaire de la Capitale

Guy Pelletier and Claudie Solar
Professors
Université de Montréal

ASSISTED BY

Fernand Laplante
Direction générale des programmes et du développement
Secteur de la formation professionnelle et technique et de la formation continue

Pierre Bélanger, Manon Bergeron and Danièle Soulière
Commission scolaire de Montréal

Langis Lemieux
Commission scolaire des Découvreurs

Gilles Vallée
Commission scolaire des Navigateurs

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Direction de la production en langue anglaise
Services à la communauté anglophone

GRAPHIC DESIGN

Deschamps Design
info@deschamps-design.com

“For the children of today, the workers of tomorrow…”

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[1] T.N.: Also referred to as "continuing education and training" in related documents.

PART 2

Foreword

At the end of the 1990s, two large international forums organized by the International Organisation of the Francophonie (Bamako, 1998) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (Seoul, 1999) highlighted the importance of technical and vocational education and training (TVET) in the socioeconomic development of countries and the fight against poverty and social exclusion. The recommendations ensuing from these two forums also allowed the two organizations to ensure that their intervention strategies and action plans supported the governments of their respective member countries in their efforts to renew their national policies on TVET.

In 1998, Québec had the privilege of being closely associated as a technical partner with the organization of the Assises francophones de la formation professionnelle et technique held in Bamako. It also helped implement the ensuing action plan adopted by the heads of state during the 8th Francophone Summit in Moncton in 1999 (renewed at the 2002 Beirut Summit).

The conceptual framework and the thematic notebooks on the engineering of technical and vocational education and training are part of Québec's contribution to this action plan. With widespread distribution in countries of the Francophonie, these tools have been used as the reference framework for the implementation of a broad intergovernmental partnership program involving close to 50 countries in six regions of the world. The Agence intergouvernementale de la Francophonie also relied on the framework to create the Base des savoirs francophones (BSF) (database of francophone knowledge), which is designed to actively support, through the Internet, the member countries in their exchange of expertise and in their reform and development initiatives related to TVET.

More recently, UNESCO, through its International Centre for Technical and Vocational Education and Training, UNESCO-UNEVOC, has shown interest in using this framework to support its international efforts, in particular the management of knowledge in vocational and technical education and training.

Québec is pleased to share its expertise by making this framework available to UNESCO-UNEVOC in English, French and Spanish. In this way, Québec will be contributing to the improvement of the vocational and technical education systems of numerous countries. It will thus continue its commitment to the countries of the Francophonie to support international cooperation in vocational and technical education on a multilateral basis worldwide.

Pierre Reid,

Minister of Education of Québec

The reform of vocational and technical training

The context

The conclusions and recommendations ensuing from the Assises francophones de la formation professionnelle et technique in Bamako in 1998 and the Second International Congress on Technical and Vocational Education in Seoul in 1999 highlight the broad international consensus that exists with respect to the importance of technical and vocational education and training (TVET[1]) and the principles and orientations that should guide any reform process in this area.

The text adopted at the end of the Assises francophones de la formation professionnelle et technique in Bamako, entitled *Les Conclusions de Bamako*, states the following:

Reform is based on four main guiding principles:

- As a specific sector of education, but open to the labour market, TVET contributes, just as does general education, to an overall level of education. This supposes that:
  - TVET is solidly established in the new basic school
  - TVET is part of a lifelong learning process
- TVET should continue to focus on local, regional and national socioeconomic realities in the current context, which is characterized by the globalization of the economy and employment. This requires a better understanding of the nature of the labour market and an analysis of the demand, in both the formal and informal sectors of the economy.
- Any reform process must involve the expansion and diversification of program offerings, while giving preference to cooperative forms of TVET. This implies a generalized decompartmentalization of education systems with respect to:
  - the adaptation of structures so that open, simple and flexible modes of operation can be incorporated
  - the consideration of structured and unstructured models in the types of training
  - more flexible management of human resources so that individuals' competencies can all be put to use
  - the design of flexible programs focusing on competency-based objectives
  - the diversification of funding, in particular through the commitment of all parties concerned
- This new concept of TVET supposes that management methods be revised by setting up partnerships based on the redefinition of the role of the state and of all partners in the sector. Only a true policy of dynamic partnership with clear guidelines can create the conditions required for sector reform. An authentic

[1] The Québec ministry of education generally uses the term "vocational and technical training."

> partnership bringing together public authorities, business, nongovernment organizations and users must be based on a shared willingness to achieve a common objective as well as on respect for and balance of competencies; it must strive for the real co-management of the TVET system. [Translation][2]

The recommendations ensuing from the Second International Congress on Technical and Vocational Education in Seoul signal the need for a human-centred development paradigm. TVET, as an integral part of lifelong learning, has a crucial role to play in this new era as an effective tool for realizing the objectives of a culture of peace, environmentally sound sustainable development, social cohesion and international citizenship.

Seven of these recommendations[3] constitute the main axis of intervention on which UNESCO's action plan is based:

1.3: *Therefore* TVE [*Technical and Vocational Education*] *systems must be reformed to give life to this new paradigm by achieving flexibility, innovation and productivity, imparting the skills required, addressing the implications of changing labour markets, training and re-training the employed, unemployed and the marginalized with the objective of achieving equality of opportunity for all in both the formal and the informal sectors of the economy.*

1.4: *There must be a new partnership between education and the world of work to address the need to develop a synergy between the sectors of education and industry and the various other economic sectors, to foster the development of generic competencies, the work ethic, technological and entrepreneurial skills, and for imparting human values and standards for responsible citizenship.*

1.5: *There is a need to introduce the required changes in a manner suitable for each country, so as to empower and engage human beings in the context of the new paradigm, with* TVE *as a common key focus of the reform process.*

5.1: *Although governments carry the primary responsibility for* TVE, *in a modern market economy* TVE *policy design and delivery must be achieved through a new partnership between government, employers, vocations, industry, trade unions and society. This partnership must create a coherent legislative framework to enable the launching of a national strategy for change. Within this strategy the government, apart from actually providing* TVE, *can fulfil the roles of giving leadership and vision, facilitating, coordinating, establishing quality assurance and ensuring that* TVE *is for all through identifying and addressing community service obligations. The capacities of the partnerships must be enhanced through training schemes and facilities to impart appropriate skills.*

5.8: *All* TVE *partners will be required to increase constantly their knowledge and expertise in many areas affecting* TVE *systems. Effective mechanisms must therefore be established to share experience and expertise through ongoing research of particular relevance for key policy issues. Other approaches may include jointly shared data banks, multi-media technologies, and regional and international co-operation.*

5.9: *There is significant scope for countries to share their experience with the design and operation of national* TVE *policies and strategies, and appropriate public and private roles and partnerships. In this*

[2] Excerpt from the document *Les Conclusions de Bamako : Éléments de politiques et d'orientation de la formation professionnelle et technique en Francophonie et cadre d'action*, which was adopted at the end of the Assises francophones de la formation professionnelle et technique in May 1998 in Bamako, Mali.

[3] Excerpt from the document *Second International Congress on Technical and Vocational Education: Lifelong Learning and Training for All, A Bridge to the Future. Final Report*. Seoul: Republic of Korea, 26-30 April 1999.

regard there is a need for mutual and cooperative assistance between developing and developed countries and those countries with emerging market economies.

6.2: *Further co-operation is encouraged between* UNESCO *and its international partners such as the* ILO, *the World Bank and the Regional Development Banks*, OECD, *the European Union and* CEDEFOP, *the European Training Foundation*, ISESCO, *the Commonwealth*, *La Francophonie, etc. to enhance* TVE, *with* UNESCO *assuming a co-ordinating role through its comparative advantage in the various fields of education.*

In addition to strongly encouraging the maintenance and enhancement of international cooperation to renovate and sustain TVE systems, congress participants also recommended that international financial authorities "recognize the contribution of education, and particularly TVE, to the maintenance of peace and stability and in preventing social dysfunction, and … incorporate the support of TVE in their conditions for assistance to recipient countries."

On the basis of these principles and foundations adopted by the international community and the orientations that had guided it in its TVET reform begun in 1987, Québec undertook a process to determine the foundations for a conceptual framework that could be made available to countries that were reviewing or renewing their TVET systems. This process led to the development of a preliminary conceptual framework and thematic notebooks on the engineering of TVET.

Development of a conceptual framework for the reform of vocational and technical training

The engineering of TVET, first presented in the form of four thematic notebooks, was designed and written up to support an important project of the Agence intergouvernementale de la Francophonie (AIF), entitled *Appui aux politiques nationales de formation professionnelle et technique* (support for national TVET policies). The project is active in six regions of the world and involves close to 50 member countries of the Francophonie.[4] This document is part of Québec's contribution to defining a conceptual framework for the TVET reform that is in line with the guiding principles adopted at the Bamako conference and to establishing intergovernmental partnership in the main Francophonie regions.

First designed as an analysis and reflection tool to support the thematic workshops held during transnational seminars that began the reflection process in each of the six regions, the conceptual framework for the reform of TVET systems has evolved into a frame of reference that can be used to design and plan the next steps of the partnership process. For example, the frame of reference has served as a guide for defining and setting priorities for partnership projects in each region, and for establishing a structure for organizing information deposited with the Base des savoirs francophones (BSF) since its inception in 2002.

[4]
- Western Africa (Benin, Burkina Faso, Ivory Coast, Guinea, Mali, Niger, Senegal and Togo)
- Maghreb-Machrek (Djibouti, Egypt, Lebanon, Morocco, Mauritania and Tunisia)
- Central Africa (Burundi, Cameroon, Central African Republic, Congo, Democratic Republic of the Congo, Gabon, Equatorial Guinea, Madagascar, Rwanda and Chad)
- Island countries (Guinea-Bissau, Comoros, São Tomé and Príncipe, Mauritius, Seychelles and Vanuatu)(absent: Cape Verde, Dominica, Haiti and St. Lucia)
- Eastern Europe (Albania, Bulgaria, Moldavia, Romania, Macedonia, Lithuania, Poland, Slovenia and Czech Republic)
- Asia (Cambodia, Laos and Vietnam)

Along with the proceedings of the seminars, the frame of reference constitutes a tool that can be used to inform and integrate new members joining the work teams during a project.

It would be difficult to establish a conceptual framework for TVET reform without taking into account the environment in which the reform will be implemented and the basic principles underlying its development and scope of application.

During the international exchanges of Bamako and Seoul, three basic elements were updated. These elements contribute to defining the foundations and limitations of the process to produce a conceptual framework.

- As it already does for basic education, the State plays a crucial role in designing and implementing a TVET policy. It is responsible for determining the bases of the TVET reform process and, as needed, for reviewing it so as to ensure the best possible results.
- All TVET systems must be defined in close collaboration with the labour market. The competencies required to practise a trade or occupation must be at the heart of any process leading to the development of a program of study.
- The design and implementation of a TVET policy must take place in a spirit of openness and participation among all the sectors concerned (formal and informal). The establishment of partnerships between the education community, the labour market and all bodies involved in the socioeconomic development of a country or region is a fundamental condition for the success of any policy project.

The conceptual model presented in detail in each of the parts of this document is referred to as the "engineering of vocational and technical training." **The engineering of VTT is defined as the body of policies, tools and methods required for the coordinated and rigorous design, organization, implementation and evaluation of educational activities in VTT.**

These educational activities are based on the acquisition of competencies. Although there are a number of definitions of the **concept of competency**, most authors describe a competency as **a grouping or integrated body of knowledge, skills and attitudes that allow an individual to successfully perform an action or set of actions such as a work-related task or activity.**

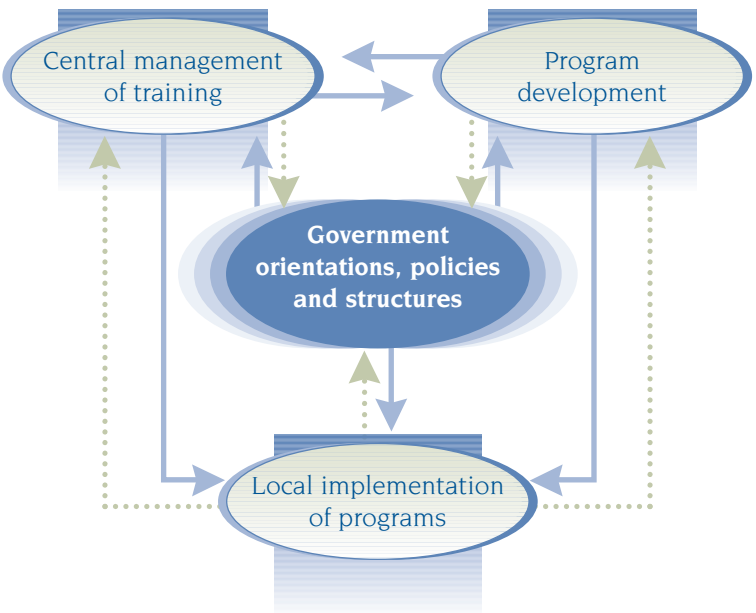
Figure 1 illustrates the VTT engineering model, which is made up of four different components.

1. The first component deals with the definition of government orientations, policies and structures in matters of VTT. Any process involving the reform or updating of a VTT system starts here and is then ratified by law. Given the crucial role that the State plays in providing direction for the system, it is also responsible for defining and implementing the required management structures.
2. The second component involves the central management of VTT, which may take many forms. This management may be very centralized, governing all related decisions and actions; it may also be decentralized, with numerous responsibilities being delegated to regional authorities and even to educational

institutions. Regardless of the management and delivery methods, there are nonetheless several areas that must necessarily fall within governmental jurisdiction because these areas must be part of a global process and will be at the core of any process involving the reform or review of a VTT policy.

3. The third component concerns the development of programs of study. It generally deals with the design of programs of study or the definition of the skill sets required, using the competency-based approach. In conformity with the organizational model adopted by the State, this responsibility may be considered part of the central management of education or may be entrusted in full or in part to decentralized management structures, even to educational institutions. The program development process may just as well take place within a ministry (government programs or State-determined skill sets) as within educational institutions or the workplace (programs or reference documents designed to meet specific training needs). This is why the theme of program development has been covered as a specific component of this engineering model.
4. The fourth component is program implementation at the local level. It covers the major challenges that educational institutions must meet when delivering competency-based programs. The responsibilities inherent in this task include the organization of teaching and instructional methods that simulate as closely as possible the working conditions

Figure 1 Components of the Engineering of Vocational and Technical Training



related to the trade or occupation in question. This component also covers the new responsibilities of educational institutions working in a decentralized management environment based on partnership.

Figure 1 clearly illustrates that the components of the VTT engineering model influence each other. Government policies have an impact on training management methods, program development and program delivery in educational institutions. There are formal links (as indicated by the solid lines) and informal links (broken lines) that show that these latter three components are in constant interaction. Government orientations and policies may even be modified or adapted as a result of this interaction.

The central management of training, for example, is one input in program development, especially with respect to data resulting from labour market observation. Once the programs have been developed on the basis of this information, it is possible to continue the management activities required to deliver the programs, for example, determining instructional methods and funding parameters.

Local program implementation is based on policies, centralized management methods and the results obtained during program development. And the reality of teaching institutions is taken into account in the policy making, centralized management and program development.

Although this reference framework presents the engineering of VTT in four distinct components, these components should be seen as being implemented in an interactive, and not a linear, manner. These activities are therefore not to be carried out in a specific sequence, but rather as processes that impact upon each other and that may be modified as a result of this interaction.

The methodological process

The engineering of TVET is first and foremost a conceptual framework to be used to support the analysis and reflection activities of representatives of countries involved in a partnership project, to enable them to discuss the main initiatives required to strengthen or renew their VTT system. The goal is to allow decision makers and authorities in the participating countries to exchange information on their respective situations and to explore avenues for cooperation with a view to establishing a future partnership among governments undertaking reform of their VTT system.

For each component of the engineering model, a series of themes, subthemes and content elements is presented (see the summary sheets at the end of each part), with the result that idea sharing is promoted. The content of each part provides a detailed description of the various themes, facilitating the comprehension of the underlying concepts and processes.

Although the various themes are covered in a logical sequence, they most certainly do not constitute a methodological process that requires a linear approach to establishing and implementing a VTT policy. Nonlinear models are better suited to the complexity of systems and the time frames required for collecting data.

It is possible to adapt and enhance the proposed conceptual framework on the basis of each country's situation and its administrative and cultural context. This fosters sharing of viewpoints among

partner states and promotes the implementation of a conceptual framework that is specific to each participating country and reflective of its particular characteristics and orientations.

The engineering of vocational and technical training

Government orientations, policies and structures

Government orientations, policies and structures

1 Introduction

Today, education is a key factor in the economic and social development of a country, and vocational and technical training is an integral part of any education system. Yet, while literacy and basic education for all citizens are priorities for most countries, the role of vocational and technical training is perceived in different ways. The debate on the relative importance of general education and vocational and technical training is ongoing, resulting in a variety of different strategies. Some countries favour general education, since it leads to higher education, while others offer vocational and technical training immediately after the completion of basic education, which, in most countries, means after nine years of schooling.

Relegating vocational and technical training to the back burner, however, means reducing job opportunities for a large segment of the population that cannot—and does not wish to—obtain a university diploma. Economic development relies on a sufficiently well-trained work force that can adapt to change. Even in industrialized and technologically advanced countries, less than 25 per cent of jobs require university education, while more than half call for vocational or technical training. Consequently, it would undoubtedly be helpful to review the role of vocational and technical training in a number of education systems.

Employment data reveal the importance, not only of providing vocational and technical training, but also of adapting it to the country's economic and social situation. This is why it is important to involve all players in the implementation or reform of an effective and successful vocational and technical training system. The mobilization of different players from the education and business communities and civil society makes it possible to take into account the needs and expectations of the public and businesses in a shared and ongoing social project.

The implementation or **reform of a vocational and technical training system is, however, a relatively lengthy process, which begins with the formulation and adoption of national policies and culminates in the establishment of a series of administrative measures** favouring sustainable development or promising reforms.

This process is described in detail in this section on *Government Orientations, Policies and Structures* related to vocational and technical training. The section focuses on the policy development process illustrated in Figure 1, which leads to the establishment

of the government orientations, policies and structures underlying vocational and technical training. The text that follows describes each of the phases in detail, beginning with the establishment of the government's priorities and its sociopolitical commitments to its citizens, based on a strong national, and sometimes international, partnership. The government then defines the roles, powers and responsibilities of the different local or regional authorities, which requires the participation of the different political, social and economic partners. It then revises the legislative and regulatory framework governing vocational and technical training, so that the system is brought into line with the new orientations. This includes aspects related to working conditions, training regulations and initial training. Finally, the government establishes an administrative apparatus for the system by creating or modifying the management structures at the government, ministry and local levels. Depending on the degree to which the desired vocational and technical training system is to be centralized, the sharing of responsibilities among ministries, regional authorities and educational institutions must be clear, and the administrative structure must be simple and consistent with the respective missions of each of the components. The goal is to achieve an effective and efficient vocational and technical training system.

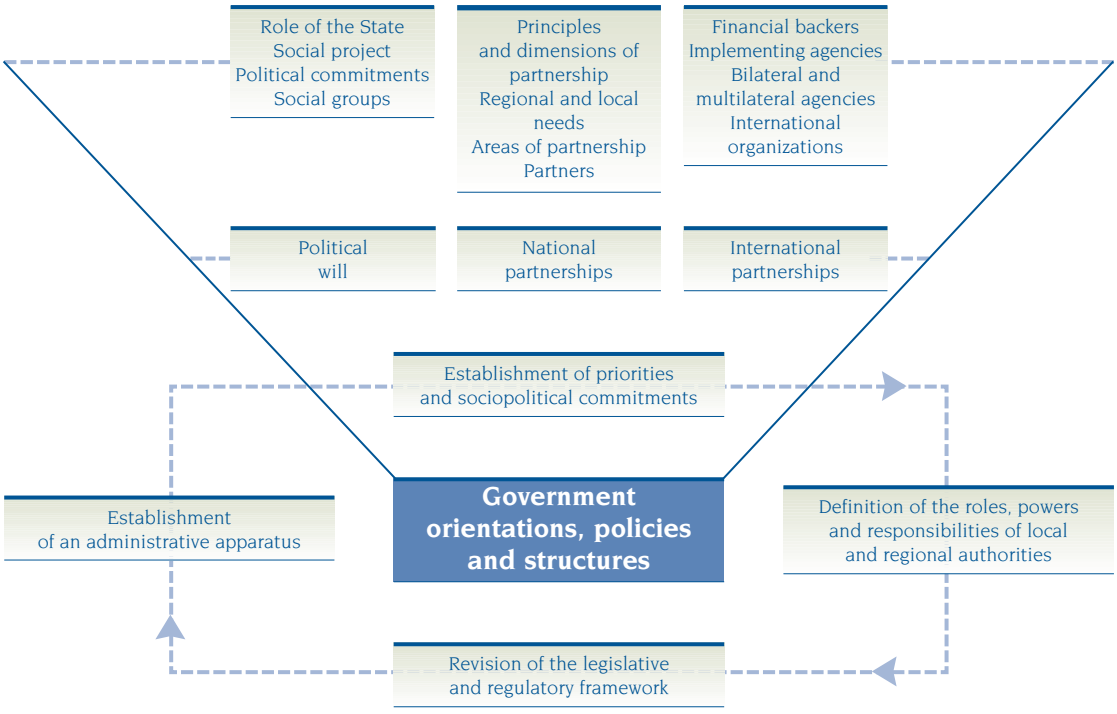
2 Establishment of priorities and sociopolitical commitments

The harmonization of the economy, the labour market and the work force is one of government's main responsibilities. Whether it be in the public, parapublic or private sector, a qualified work force helps promote and support adequate socioeconomic development, both quantitatively and qualitatively. This is where the vocational and technical training system plays a determining role, by adjusting program offerings to the real needs of the labour market in every socioeconomic sector and in every region. The availability of a qualified work force:

- attracts businesses to a given area and encourages existing businesses to remain
- supports productive businesses and organizations
- promotes the growth of the collective wealth
- improves the standard of living of the population

Figure 1 Policy development process

Figure 2 Establishing priorities and sociopolitical commitments



Conversely, the lack of a qualified work force hampers business development, limits investment and job creation, and creates obstacles for foreign companies, thereby hindering social and human development. For this reason, the state must ensure that the initial and continuing training of the work force is relevant, by maintaining and fine-tuning those branches of vocational and technical training that meet real needs, terminating those that are no longer appropriate and developing those required by the ever-changing and highly competitive economy. Failure to do so will result in a waste of financial resources and the demobilization of human resources.

The first step in the reform of a vocational and technical training system is to establish priorities and sociopolitical commitments. As illustrated in Figure 2, these priorities and commitments are based first and foremost on the government's firm *political will*. The participation of political, economic and social players is also required if the priorities are to correspond to real needs and take into account the current context. This is why it is important to form *national* and *international* partnerships.

2.1 Political will

Without the government's political will, the implementation or reform of a vocational and technical training system is impossible. Like a ship without a captain, it would lack direction and flounder. **The State therefore has a major role to play, and its participation is part of a *social project* to which the government is *politically committed*, together with the different *social groups* that contribute to the dynamics of the country.**

2.1.1 Role of the State

The focus of vocational and technical training is human resource development. The growth of the number of highly qualified workers does not only contribute to a country's economic development, it is also the key to its technological, cultural and social development. A clearly expressed political will on the part of the government can channel energies from different sources.

The State has a **leadership role** to play in vocational and technical training. It must state its major orientations or, better yet, initiate a social debate so that all partners and citizens can express their views on the basic question. This process entails a collective awareness that should help unite efforts in exploring means of attaining the targeted objectives. Thus, training objectives can merge with cultural, social and economic development objectives. **Once the objectives have been defined, the government can establish guidelines for a vocational and technical training system, ensuring its integration and harmonization within the overall education system.** Providing access to a variety of quality programs of study for as many individuals as possible is imperative in modern society.

2.1.2 Social project

Vocational and technical training focuses on a social project that allows every citizen access to initial or continuing training for the purpose of learning a trade or occupation. The aim of education in general, and of vocational and technical training in particular, is to equip all individuals to contribute positively and constructively to society, to play a role in it and influence it in some way, to contribute to the collective well-being, and to attain self-fulfillment in accordance with their aptitudes, interests and choices. By providing society with qualified human resources in all spheres of economic activity, the government can meet the needs and expectations of both private and public organizations, which rely on a qualified work force to ensure their own development and, consequently, the individual and collective enrichment of society as a whole.

2.1.3 Political commitments

The government's political will is expressed as clear commitments, in particular with respect to human resources, one of the driving forces of development. **Qualified men and women are the only commodity that the State itself can help produce and whose ongoing availability it can ensure**. In fact, it can control the renewal of the work force, particularly through the implementation, renewal or reform of a vocational and technical training system.

To ensure the support and participation of the various social groups, these political commitments must be translated into action and financial resources must be made available to support these actions.

2.1.4 Social groups

The State could not, however, establish guidelines for quality vocational and technical training, develop programs of study or make educational resources available without the constant participation of all the social players. **It is therefore in the State's interest to solicit and encourage the contribution of the different civil society groups**, in particular employer associations, unions, employee associations and the

different social groups involved in the formal and informal sectors of the economy. **The contribution of the different players, regardless of their cultural or ethnic background, gender or age, is a crucial driving force behind the joint development of a vocational and technical training system and its adaptation to the country's real needs.**

This process involves not only the State, but other local and regional authorities as well. Experience in a number of countries has shown that regional participation and local control play a determining role in the success and effectiveness of projects in education, as well as in other fields.

2.2 National partnerships

Partnership is the end result of a collaborative process that begins with the building of relationships among different social groups or players and with the learning of a common language. Its success is dependent on an equitable relationship among the partners, a clear definition of the roles and responsibilities of each one, and a sharing of a common set of values on which actions will be based, and the advantages of these actions for each player.

2.2.1 Principles of partnership

Partnership is not a question of simply finding collaborators with a view to organizing a given activity. It is a long-term process that involves working together to find ways of changing and improving certain aspects of the training system. The following are some of the principles underlying successful partnerships:

- Partnership cannot be forced; it must be created.
- Each party must have an interest in the partnership.
- Each party must have certain powers.
- Partnership is a means, not an end in itself.
- It must rely on a variety of approaches or formulas.
- It must exist at the local, regional and national levels.

2.2.2 Dimensions of partnership

The diverse ways of organizing training—greater use of practicums, the work-study approach, apprenticeship training—require a greater commitment to training on the part of the business community. Growing training needs and costs, as well as the State's limited ability to pay, demand greater participation from businesses and organizations.

The State, however, is not the only party to benefit from such partnerships. **For their part, businesses reap a number of benefits**:

- access to information about techniques and processes
- possibility of guiding/adapting programs of study to meet their needs
- quality consulting services to meet their needs
- implementation of continuing training activities for their own employees
- support in defining hiring criteria
- etc.

2.2.3 Regional and local needs

The nature of labour market needs and the speed at which they change make it necessary to continuously adapt programs of study. The fact that needs vary according to economic sector and region means that

vocational and technical training must be adaptable to local and regional needs, while maintaining a national perspective. That is why it is important to ensure the active participation of players who are familiar with the targeted regional or local community and its needs.

2.2.4 Areas of partnership

There are many reasons to form partnerships in vocational and technical training. Some forms of partnership already exist, while others must be created. Experience has made it possible to identify a number of areas that require greater cooperation among partners from education, the world of work and the community.

At *the national level*:

- defining major orientations with respect to education in general, vocational and technical training, and employment
- determining actions to be taken in the labour market
- mobilizing the different partners in favour of the work-study approach and apprenticeship training
- specifying the orientations of the education and training systems
- developing proposed laws and regulations

At *the regional level*:

- establishing the desired relationships between regional socioeconomic development plans and vocational and technical training development plans
- influencing the regional distribution of programs of study and the implementation of proposed training plans
- analyzing labour market trends in the region and specifying the main regional challenges with respect to initial vocational and technical training and continuing training

At *the local level*:

- adapting programs of study to the needs of local businesses
- identifying businesses willing to host student trainees for the purpose of implementing programs of study using the work-study or apprenticeship training approach
- student placement planning
- defining the orientations of the centre or school
- evaluating the programs of study and the employers' degree of satisfaction
- participating in the purchase or loan of equipment and the establishment of budget priorities
- participating in recruiting and training teachers

2.2.5 Partners

The above-mentioned dimensions reveal the wide range of possible players in a national partnership:

- local and regional administrators
- employers
- unions and professional associations
- representatives of social groups, including women's groups
- representatives of the informal sector, which, in many countries, represents a significant segment of the economy

2.3 International partnerships

International partnerships can take many forms and come into play at different levels. Partners include *financial backers*, *implementing agencies*, *bilateral and multilateral agencies*, and *international organizations*.

2.3.1 Financial backers

Some international development organizations can provide financial support for the reform of a country's vocational and technical training system. These funding agencies are generally well known and have already set up offices in developing countries. The World Bank, the African Development Bank, the Inter-American Bank, the European Economic Community and the Canadian International Development Agency are only a few examples.

2.3.2 Implementing agencies

Implementing agencies, another type of organization devoted to international development, specialize in the implementation of cooperation projects. These organizations, which exist in many countries, include educational institutions, ministries, government and nongovernment organizations, and a number of private companies and nonprofit organizations.

Note that funding agencies can also act as implementing agencies for the projects they are backing. More often than not, however, funding agencies delegate part or all of the responsibility for implementing their projects to other agencies, such as nongovernmental organizations, private companies, educational institutions or associations of educational institutions. These organizations respond to calls for tenders issued by implementing agencies and, most often, are responsible for a specific aspect of a project, while the implementing agency remains in charge of the overall project.

2.3.3 Bilateral and multilateral agencies

Today, international cooperation is a well-developed area, especially since information and communications technologies now promote the exchange of opinions and make it possible to create and consolidate networks. Thus, the reform of a vocational and technical training system can benefit from bilateral cooperation, i.e. cooperation between two different countries. Cooperation may be multilateral when the agencies in question are themselves made up of several member countries, i.e. the United Nations Educational, Scientific and Cultural Organization (UNESCO) and, of course, the Agence intergouvernementale de la Francophonie (AIF).

2.3.4 International organizations

The aim of the different international cooperation organizations is to help countries that request their assistance to organize or reform their vocational and technical training system but they cannot, nor should they, take the initiative or take control of the process. Each country is in charge of its own reform and is responsible for giving it direction. Each country must set its own objectives, priorities and timetable.

Here, the relationship with *political will* is very clear. Some countries prefer to define the objectives of the reform within the framework of a public debate, the government being responsible for helping the different levels of society reach a consensus. Other countries favour a more centralized approach to the determination of objectives. In every case, international partnerships are

desirable insofar as they contribute to the implementation of national management plans and policies by providing countries that request their assistance with technical and financial support. **International assistance will have positive long-term effects if its aim is to guide national institutions, while holding them accountable for their actions.**

SUMMARY

A vocational and technical training system builds on government priorities and sociopolitical commitments that are consistent with the country's economic and social reality. The establishment of priorities and sociopolitical commitments relies on the government's *political will*, clearly expressed and backed by financial support. Words must be followed up with actions. This political will is supported by *national* and *international partnerships*. The purpose of national partnerships is to define orientations and set priorities while taking into account the local and regional needs of all political, economic and civil players. The purpose of international partnerships is to help in the reform of the training system. The State, therefore, plays a leadership role, and must be open not only to the players' needs but also to possible means of achieving objectives, since partnerships imply a certain measure of sharing.

3 Definition of the roles, powers and responsibilities of local and regional authorities

It is easy to understand how the government's political will to create or redefine a vocational and technical training system might require an in-depth revision of the legislative and regulatory framework in which the system is to evolve and develop. Before beginning such a revision, however, **the government and its principal partners must, on the one hand, have reached an agreement concerning the type of system that best meets the needs of the country or the State and, on the other, have reached collaborative framework agreements.** These agreements are generally reached at summit meetings or estates general in which all partners in the vocational and technical training system and the education system in general participate. These meetings, which can also be held at the regional level, allow the different groups to express themselves and make it possible to design a system in keeping with the different expectations expressed and the framework of a national project.

The successful implementation, development and promotion of vocational and technical training paths in the different regions rely on the contribution and commitment of *political authorities* and different sectors, i.e. *associations and formal, informal and community groups*. The participation of representatives of these sectors is the best guarantee that the region's needs will be met, since these people are familiar with those needs. Vocational and technical training could even make it possible to create new windows of opportunity or develop economic activities in line with regional priorities.

Collaboration with the different sectors should not be limited to defining needs and translating these needs into learning activities. It can also be used to support vocational and technical training by opening the door to different learning strategies: apprenticeship training, different types of work-study schemes, practicums in the community or distance education. **Vocational and technical training will benefit from an open and flexible approach.**

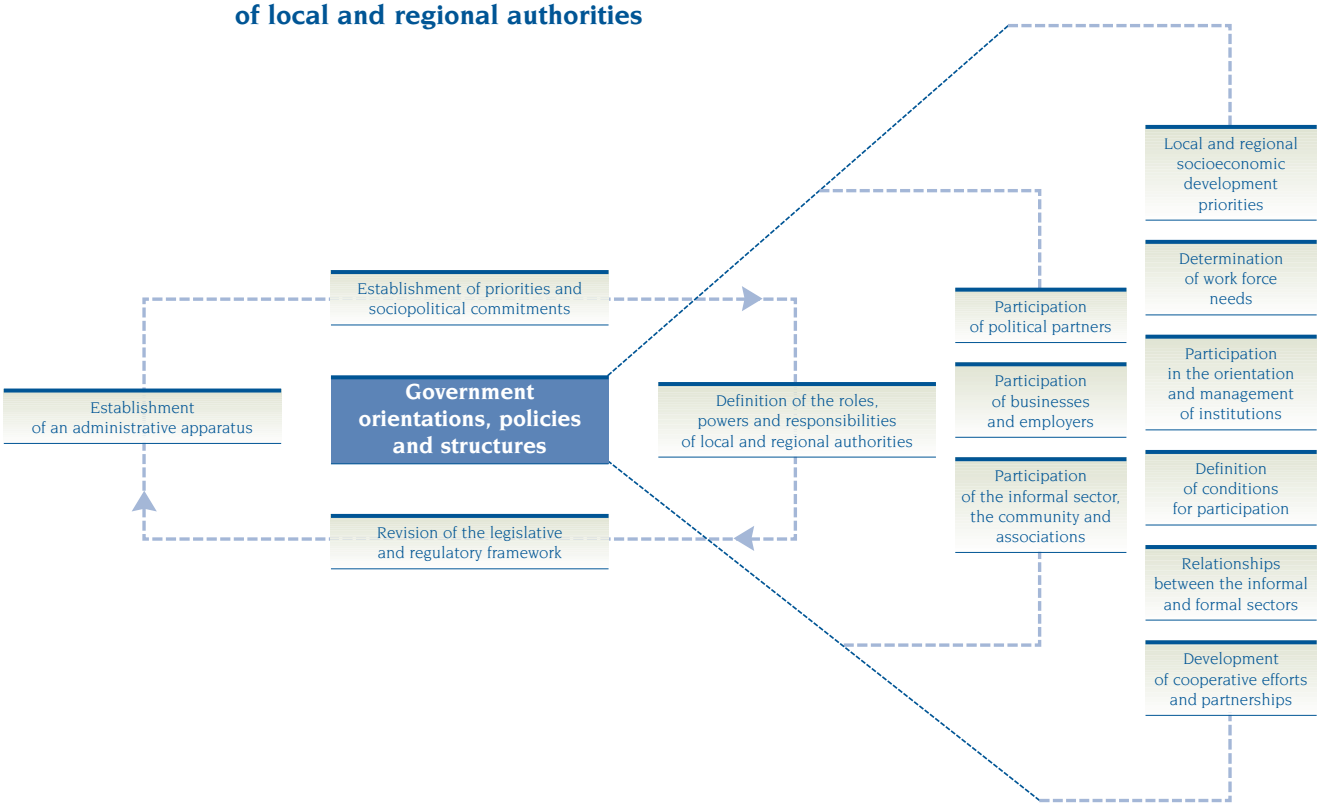
Finally, a variety of program offerings in the different regions will allow young people in particular to pursue their training in their home region and, more often than not, to remain there, contributing actively to local and regional development.

3.1 Participation of political partners

If a vocational and technical training system is to have the desired impact, it is important to ensure that the training it provides contributes to the social and economic development of the regions, and that the training required for this development be accessible in the region or at least *for* the region. For this reason, local and regional authorities must be asked to participate in the development of the system and their roles, powers and responsibilities must be defined.

At this level, a balance must be struck between the direction provided by the central authorities in the system's reform and the appropriation of the process by local and regional authorities.

Figure 3 Definition of the roles, powers and responsibilities of local and regional authorities



The participation of political authorities should make it possible to impart local and regional colour to institutions offering vocational and technical training. Because they are an integral part of the community, adapted to its particular characteristics, institutions offering vocational and technical training can become a driving force of economic development in the region and the local community. For example, they can share their equipment and qualified human resources with businesses that would like to enhance the competencies of their work force, or who require technical assistance for the development of a new product or process. They can also support the development of entrepreneurship by providing different types of business start-up assistance. The establishment of a successful vocational and technical training centre in a region will, in itself, create jobs.

3.2 Participation of businesses and employers

In a system based on the demand for competencies, the labour market plays a significant role in determining work force needs. The participation of businesses and employers of all sizes, in all socioeconomic sectors and in every region, will make it possible to accurately define both qualitative and quantitative needs.

Important partners such as businesses, employers and the organizations that represent them (e.g. sectoral associations, chambers of commerce, and so on) must be able to help guide the management of institutions offering vocational training. The active participation of business representatives on boards of directors, steering committees or management committees, regardless of their structure, will guarantee greater convergence between labour market needs and the training offered by the centre. In fact, these representatives could work with training specialists on the orientation of programs of study and their adaptation to local needs. They can facilitate the establishment of long-term relationships between the centre and the businesses in the region in order to promote the placement of trainees (students and teachers) or to encourage businesses to help fund the centre through financial and material donations, or loans of equipment. They could also help define an in-service training plan for teachers and, possibly, encourage the participation of trade specialists employed by the businesses (lectures, conferences, training, etc.).

The more employers participate in the vocational training centre, the more the centre will become an integral part of the community. This association will enable the training institution to project an image of quality and to build credibility in the community.

3.3 Participation of the informal sector

The line between the formal and informal sectors varies from country to country and possibly from region to region, depending on the social, political and economic context. Whatever its size, however, the informal sector contributes to a dynamic economy. For this reason, we believe that it is important to ensure the participation of representatives of the informal sector, which itself will benefit from a qualified work force.

If it takes into account all the aspects of life in the region, vocational and technical

training can be diversified and potentially accessible to as many people as possible. Remember that the aim of vocational and technical training is to train people to practise all the so-called skilled and semiskilled trades or crafts, whether male- or female-dominated. These trades are often practised in the informal sector, which, in many countries, constitutes a significant, if not the largest, segment of the economy.

3.4 Participation of the community and associations

The establishment of a vocational training centre in a given territory will also benefit from the participation of **the community and associations, which can provide a local and regional perspective that is different from that of the other partners, and thus help provide a complete picture of the community. The aim of vocational and technical training is not limited to training qualified workers in highly complex trades or for work in large companies**, especially in emerging countries.

If vocational and technical training is to be adapted to the local and regional community, it is essential that there be close ties between the institution offering vocational and technical training and representatives from the community and associations. Thus, there is a need to recognize and solicit the participation of nongovernmental organizations (NGOs), i.e. community groups, charitable organizations, artisans cooperatives, women's groups and associations of small employers.

The cooperation of partners from the informal sector, the community and associations will ensure equal opportunity for all potential students. This is especially true when women's groups are asked to discuss women's needs in terms of vocational and technical training. Continuing training activities can improve the situation of employed women or women in the informal sector. Similarly, they can contribute to the recognition, consolidation and development of competencies among experienced artisans.

SUMMARY

The aim of defining the roles, powers and responsibilities of local and regional authorities is to favour the effective participation of the different partners and, in fact, of all those who can help the educational institution fulfill its mission by:

- helping determine needs or define competencies and training plans
- taking in student trainees and allowing them to gain considerable experience in the workplace
- financially supporting the development or operation of the institution offering vocational and technical training
- helping graduates enter the labour market

If vocational and technical training is to contribute to social and economic development in the regions and if the training necessary for such development is to be accessible in the region or at least *for* the region, it is important to promote the participation, on the one hand, of the political authorities and, on the other, of the formal and informal sectors as well as the community and associations, since it is their combined knowledge of the region that will make it possible to identify training needs. If a balance is to be maintained

between the State's direction and the region's actions, the participation of all partners in the life and impact of the institution offering vocational and technical training will guarantee the local and regional appropriation of the training and its adaptation to the particular characteristics of the community.

4 Revision of the legislative and regulatory framework

The legislative and regulatory framework makes it clear that the training system is expected to develop and evolve. It provides orientations for the system and sets the necessary guidelines so that it meets the public's expectations, within the boundaries of the social consensus reached by the government and its partners with respect to the sharing of powers and responsibilities. Without the legislative and regulatory framework, the implementation of an effective and productive management structure for the system would be difficult, if not impossible, to achieve, and the actions taken by the different public authorities would be inconsistent.

The legislative and regulatory framework for the vocational and technical training system usually consists of a number of laws and regulations, including the incorporating acts of ministries or agencies whose principal or secondary mission involves responsibility for offering vocational or technical training, as well as all related regulations. For this reason, before even thinking about revising the legislative and regulatory framework with a view to reforming the vocational and technical training system, it would be helpful to:

- begin by doing a thorough analysis of all the laws and regulations respecting vocational and technical training
- determine how the targeted ministries and/or agencies currently operate and interact
- evaluate the system's ability to comply with the new government orientations in terms of access, effectiveness, the sharing of responsibilities and funding

In short, an effort must be made to measure the level of consistency between the current system and the objectives resulting from the social consensus, which constitute the basis for the system's reform.

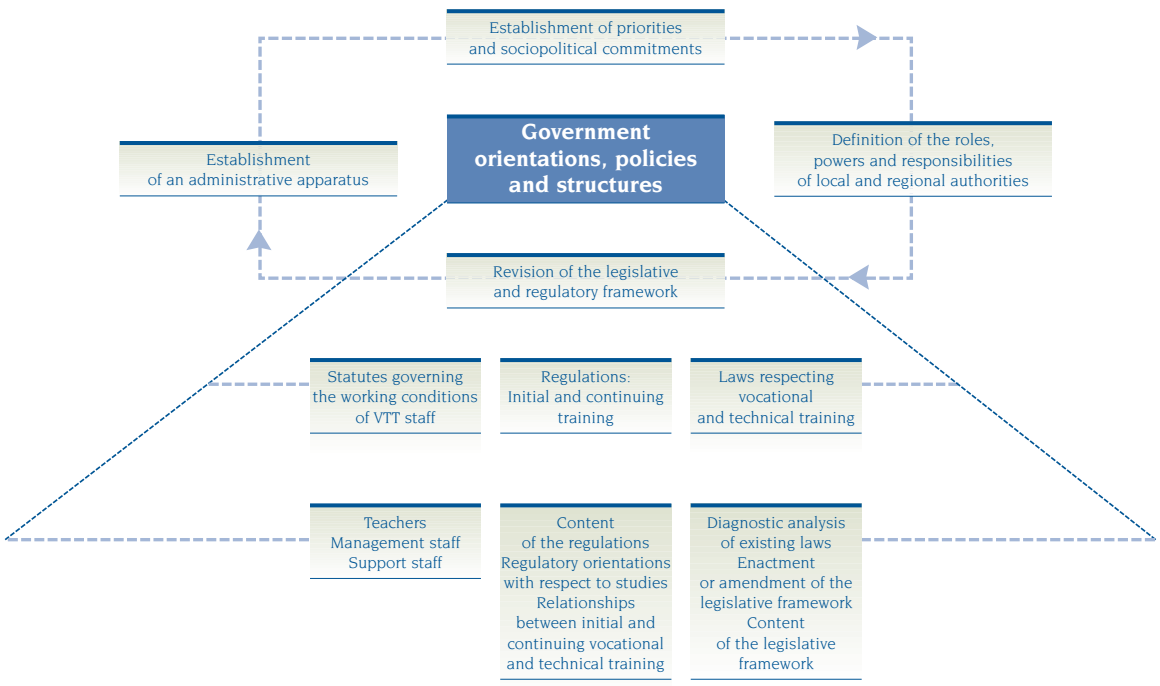
This diagnostic analysis of the legislative and regulatory framework for vocational and technical training will reveal the political and administrative choices that the country has made in its recent or more distant past, and the degree of centralization or decentralization of the training system. Depending on the country and its history, vocational and technical training may be the responsibility of a specialized ministry or several sectoral ministries (Fisheries, Agriculture, Tourism, Youth, etc.) or paragovernmental organizations. It may be offered in more or less autonomous public institutions or in more or less integrated networks of institutions; it may also be offered by the private sector. The task of organizing the vocational and technical training system may also be divided up among different ministries; for example, the observation and analysis of labour market needs could be entrusted to the ministry of Labour or Employment, while the ministry of Training or Vocational and Technical Training could be responsible for developing and dispensing programs of study.

The revision of the legislative and regulatory framework does not in itself presuppose a centralization of powers within the State or within a single government ministry. The analysis of the situation and the diagnosis with respect to the accessibility, adaptation and effectiveness of the current system will reveal whether the system must be consolidated through centralization or, conversely, whether it must be decentralized. A number of countries with highly centralized systems are now questioning their approach and delegating all but those responsibilities concerning the definition of orientations and general objectives, frameworks for action and the evaluation of expected results. Other countries, in which the decentralization of vocational and technical training is threatening the quality of the system as a whole, are leaning toward more centralization. Indeed, **in many ways, it is extremely difficult to reform a vocational and technical training system without a central authority to oversee the process.**

Whether the goal is centralization or decentralization, there is a need for greater participation on the part of employers and social partners in the definition of orientations, training objectives and programs of study. The local and regional communities also play a more important role in the definition of learning activities and in the organization and evaluation of training.

Depending on the context and the social and economic issues at stake, each country will define its orientations on the basis of its culture, experience and institutions. This definition has also been influenced by major international trends in the field, in particular those favoured by the large funding agencies.

Figure 4 Revision of the legislative and regulatory framework



The following sections will address the *laws* and *regulations* respecting initial vocational and technical training, and the statutes governing the *working conditions* of vocational and technical training staff.

4.1 Laws respecting vocational and technical training

4.1.1 Diagnostic analysis of existing laws

The first step in revising the legislative framework for vocational and technical training is to inventory, gather and analyze all laws respecting:

- basic education
- initial vocational and technical training
- continuing training

Laws respecting work force training, the contribution of workers and businesses to its funding, and labour market observation and analysis must also be studied, as must those governing the creation of paragovernmental organizations responsible for vocational and technical training and those delegating responsibility for vocational and technical training to sectoral ministries. There may also be laws respecting private education or continuing training. **The analysis of the legislative framework makes it possible to determine the current system's ability to comply with the new government orientations and, consequently, to identify the legislative changes required.**

It is important to understand that, in most countries, the vocational and technical training system, and the education system in general, is the fruit of a succession of actions that resulted in the creation of educational institutions, agencies, ministry departments and entire ministries with a specific mission, sometimes limited with respect to the system as a whole. These actions were taken at different times by different governments and people in response to specific problems. For this reason, an analysis of all the laws will often reveal that most of the components or structures are already in place to support the desired system, but that there may be a lack of harmony and balance. Poorly defined responsibilities, inadequate communication channels and a lack of overview of the system too often result in isolating organizations and individuals. This in turn causes an incredible overlap of missions and mandates, if not a duplication of structures, and a neglect of other responsibilities, essential to the system's direction or operation. Such a situation can lead to chronic conflicts that hinder the general operation of the system.

All too often, no one takes the time to take a critical look at the entire system, its components and their interactions in order to evaluate the consistency and effectiveness of the clearly defined orientations and missions shared by a group of partners.

4.1.2 Enactment or amendment of the legislative framework

Once the problems have been diagnosed, corrective measures must be taken to enable the system to achieve the targeted objectives, within the boundaries of the orientations adopted by the government and its partners.

Enshrining the orientations of vocational and technical training in a legislative framework ensures the preponderance of the government's political choices with respect to the ultimate goals of sharing power and responsibilities with the different

partners. It is usually a question of establishing the major frameworks and strategic choices that the government wants legislated in order to ensure a certain continuity. **The complex process of enacting and amending laws, however, should be limited to establishing the major guidelines of the system or institution, without regard to procedures.** The latter should be set out in regulations accompanying the laws. **Similarly, it is preferable to have a single framework law.**

The analysis and amendment of the legislative framework and the enactment of new laws are intended to ensure that the major principles underlying the reform of the vocational and technical training system are clearly stated and that all the important parts of the system are based on law, which will enable the government to orient and oversee a unified vocational and technical training policy.

4.1.3 Content of the legislative framework

Depending on the choice of the country or the State, an act respecting education in general or vocational and technical training in particular should at least set out the basic rules concerning:

- **the ultimate goal and aims of vocational and technical training**
- **students' rights and obligations**
- **teachers' rights and obligations**
- **the minimum requirements for becoming a teacher**
- **the ministry's responsibilities with respect to the planning, supervision and evaluation of the system**
- **the creation of institutions to provide vocational and technical training**
- **the management of institutions, in particular with respect to the prerogatives of their administrations and those concerning management committees or the governing board**

The different laws to establish sectoral ministries (Agriculture, Fisheries, Tourism, etc.) that also involve vocational or technical training in that sector of activity must also clearly define the missions, roles and responsibilities of these ministries, the limits of their jurisdiction and their desired interrelation with other laws or regulations governing vocational and technical training.

An act respecting work force training could create a fund to finance initial and continuing vocational and technical training activities, define the rules for participating in the fund and set up an agency to manage it.

Finally, a number of countries have adopted a special legislative framework for private education. It is sometimes necessary to review several sections of the legislative framework in order to harmonize it with the reform of vocational and technical training.

4.2 Regulations: Initial and continuing training

4.2.1 Content of the regulations

Once the major guidelines and orientations of the system have been enshrined in law, operating procedures must be set out in a basic school regulation, for example. **It is easier to amend or adapt regulations to the changing needs of a developing system than to enact a new law.** The purpose of regulations, which can be issued by a chairperson, a Council of Ministers

or the Minister himself or herself depending on the legal choices made, is to define the operating procedures for the vocational and technical training system. Regulations can take the form of an order in council or a memorandum, or anything in between, depending on the country and the specific need. Obviously, depending on the importance of the content, some regulatory vehicles carry more weight than others.

Regulations can deal with:

- the definition of diplomas with respect to targeted categories of trades or occupations
- the definition of programs of study
- the management of program authorizations
- rules concerning admission requirements for the different programs of study
- rules concerning the maximum amount a student can be required to pay for training (if any)
- rules concerning eligibility for student assistance
- rules concerning the evaluation of learning and the certification of studies
- budget rules setting funding methods for vocational and technical training
- rules facilitating transfer from one branch to another and from general education to vocational and technical training and vice versa, commonly referred to as *gateways*
- system evaluation methods

4.2.2 Regulatory orientations with respect to studies

As mentioned earlier, vocational and technical training is usually considered a lever of economic development. Unfortunately, training objectives are too often limited to integration into the work force or the entry of young people into the labour market. Vocational and technical training cannot limit itself to this role, especially when it is intended for young people in initial training. Overall personal development objectives, as well as knowledge of the scientific and technological bases of the targeted subjects will help ensure the necessary versatility and ability to adapt. These latter objectives often seem to be irreconcilable with certain work force training models that propose short programs directly associated with the performance of a task or the operation of a piece of equipment.

Thus, vocational and technical training often finds itself between a rock and a hard place, that is, between, on the one hand, policies governing basic education and general education usually intended for young people and, on the other, continuing training policies generally intended for adults or the work force. For this reason, it is absolutely essential to set out in regulations the values that guided the promoters of the reform of the vocational and technical training system and the basic orientations adopted by the different partners.

The partners must take care to establish training that not only enables graduates to practise a trade, but also to adapt to changing knowledge and techniques and integrate successfully into society.

Finally, a quality regulatory framework focusing on the orientations to be observed in the design of programs of study should, among other things:

- define quality standards
- ensure a certain degree of standardization of processes and products so that they are consistent with the expectations of the labour market

- ensure the constant credibility of the system among national and international partners—public or private, clients or suppliers—through regular evaluation of the system

4.2.3 Relationships between initial and continuing vocational and technical training

These regulations will make it possible, for example, to clearly differentiate between initial and continuing training. **Initial training** consists in the acquisition of competencies associated with the practice of a new trade or occupation with a view to entering the labour market in a job consistent with one's preferences and aptitudes. **Continuing training** consists in the acquisition of new competencies or components of competencies associated with the trade or occupation already practised by the individual, with a view to maintaining or improving employability. Continuing training is intended particularly for adults, while initial training, often devoted to young people, can also accommodate adults preparing for a career change.

If these two types of training are to be able to coexist and evolve in a consistent fashion, and if the two categories of individuals targeted are to find a satisfactory response to their needs, the programs, diplomas, admission requirements, conditions for the recognition of prior learning and educational strategies, in particular, must be clearly defined in the regulations.

4.3 Statutes governing the working conditions of vocational and technical training staff

A vocational and technical training system requires many resources, in particular human resources, to ensure its quality, operation and development. Although teachers constitute the largest group to which particular attention must be paid, management and support staff are also important.

4.3.1 Teachers

As in any education reform, teachers are the ones responsible for implementing the reform of vocational and technical training. Special attention must therefore be given to their selection, training and professional development. Their working conditions and status in the system are indicative of the real commitment to the process of reforming vocational and technical training.

Teachers' working conditions vary considerably from country to country, and sometimes even within a single country. Their status can range from government employees with good working conditions and job security to contractual workers in precarious positions without any real professional status hired by public or private educational institutions.

To ensure the quality of vocational and technical training and of its teachers, government policies must define the training and competencies required of new teachers, while ensuring that the competencies of teachers already on the job are upgraded regularly. Teachers must be seen as specialists in education as well as in their trade or occupation. They are valuable experts whose competencies guarantee the effectiveness of the system. **The appreciation of vocational and technical training also depends on the appreciation of the training and competencies of those that dispense it.**

The legislative and regulatory framework must establish minimum standards concerning teacher qualifications and, possibly,

an authorization mechanism that provides access to teaching certificates or permits. As far as possible, it might also be beneficial to offer incentives to encourage teachers to upgrade their skills in psychoeducation as well as in their specialty through professional development or even academic training.

4.3.2 Management staff

Organizing and managing the different structures of a vocational and technical training system can pose several challenges for its managers. The range of mechanisms, enrollments, players or partners involved, and the many sources of funding, training options, diplomas and methods for the recognition of prior learning make managing institutions a complex process. Consequently, management staff must be selected according to well-defined, well-known criteria regarding management skills. The management staff of a vocational and technical training centre must not only have solid management skills, but also a firm conception of the contribution of its sector of activity to the community.

To manage an institution is to be at the heart of tensions and changes in the economy and the business community, which exert constant pressure on vocational and technical training. While jobs used to be associated with certain levels of qualification (diplomas or degrees), hiring criteria today are related to demonstrated competencies in the practice of a trade or occupation. Institutions offering vocational and technical training are the ones most often directly called upon by potential employers and their own students to demonstrate their ability to "produce competencies."

Continuous labour adjustment, recognition of prior learning, career management, mobility and lifelong learning are the new buzzwords in vocational and technical training.

In this new landscape, the vocational and technical training system is constantly being challenged; its managers must be attentive to their community and on the lookout for new experiences in order to make the necessary adjustments. By and large, in the entire education system, vocational and technical training administrators are the most "visible" and accountable in their respective communities.

In such a management context, the means of responding to the need for adaptation in vocational and technical training will be all the more appropriate if the institutions have a certain amount of autonomy in the implementation of programs of study, even when they lead to official diplomas. The speed and appropriateness of the response will depend on the proximity of decision-making centres and on partnership with the community whose training needs must be met. This ability to adapt is crucial to regional development.

On the whole, **the selection of administrators, their initial and continuing training and the leeway they are given in making decisions are determining factors in a successful reform of the system.**

4.3.3 Support staff

Too often, we tend to forget that support staff is indispensable in the operation of a system, particularly in institutions offering vocational and technical training. It is important to ensure that they upgrade their knowledge of and skills in new operating procedures. Without these individuals, teachers and administrators would be hard pressed to fulfill their mission.

SUMMARY

The legislative and regulatory framework is the backdrop against which the system will be brought up to date and implemented. In order to ensure the reform of the system, a thorough analysis of all the laws and regulations respecting vocational and technical training will make it possible to determine the accessibility, adaptation and effectiveness of the current situation and to define the guidelines necessary to comply with the new government orientations. It is a matter of ensuring that all the important parts of the system have a legal basis, allowing the government to orient and supervise a unified vocational and technical training policy.

Procedures are set out in regulations, which can easily be amended in order to adapt to a constantly evolving vocational and technical training system and to ensure their continual adjustment to the needs of the economy and the regions. A quality regulatory framework covers a number of aspects, in particular:

- quality standards
- a certain standardization of processes and programs of study
- regular evaluation
- harmonization of initial and continuing training, and of education and training
- determination of gateways favouring an open, flexible system

The credibility of the system among national and international partners depends on it.

Within the framework for the reform of the vocational and technical training system, the ministries responsible must orient the system by enshrining in a legislative and regulatory framework the basic requirements for personnel management, whether or not this personnel is directly in its service. **The enhancement of the competencies of teachers and management staff is vital to the development and, ultimately, the success of the reform of a vocational and technical training system**. Even in a decentralized environment, the government is responsible for defining the minimum standards for the competencies of teachers and management staff in vocational and technical training and for ensuring compliance by means of a legislative and regulatory framework.

5 Establishment of an administrative apparatus

The "administrative apparatus" of the vocational and technical training system, that is, the assortment of management structures, is the operational component of the policies adopted. It can take different forms depending on the country, since it involves the interrelation of complex and varied elements related to training, employment and social security policies and their history. The reform of the vocational and technical training system will depend on national culture, traditions and institutions.

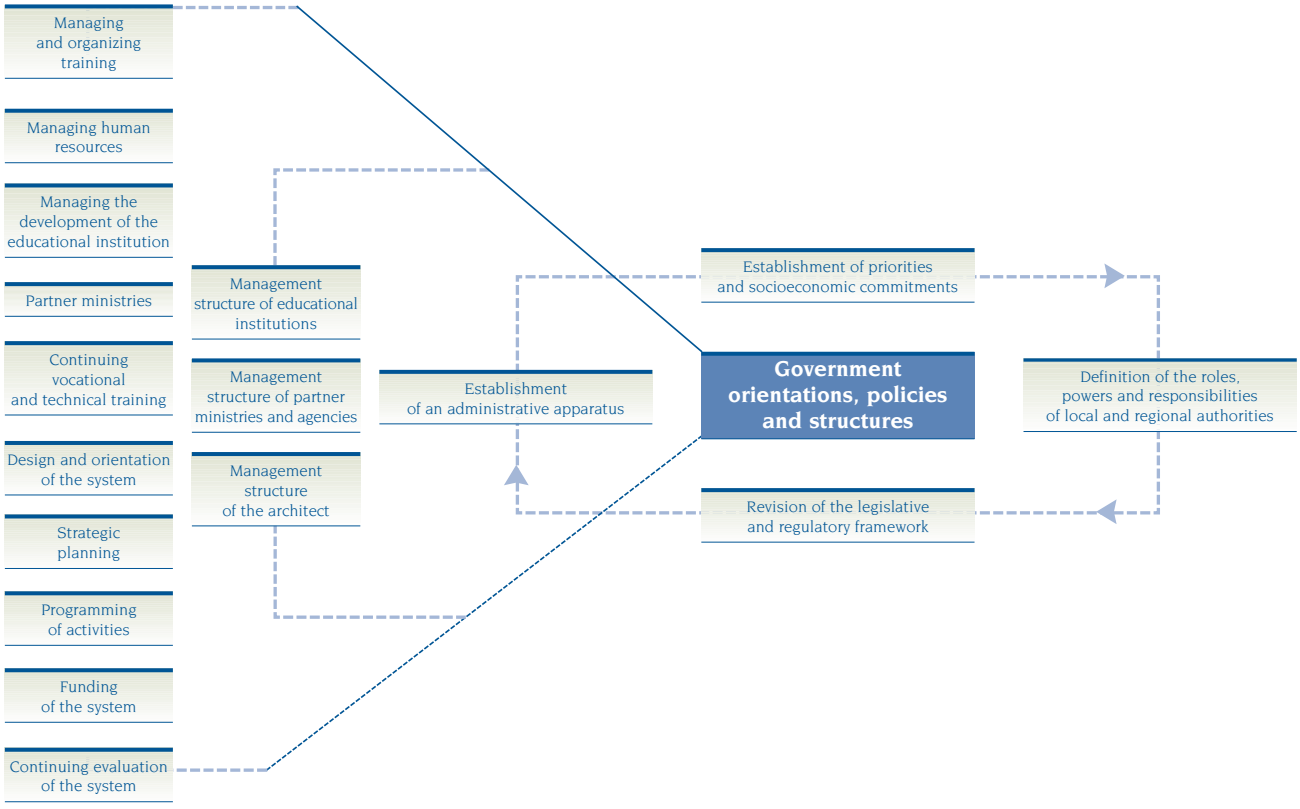
Whatever their relationship, the management structures will help, among other things, to situate both initial and continuing vocational and technical training with respect to general training and higher training. The goal is to prepare young people, and possibly older people as well, for the labour market, while allowing them the opportunity to continue on to higher training and to participate in a process of

"lifelong learning." The nature and pace of economic and social change now requires the ongoing adjustment of individuals and institutions. Consequently, **the vocational and technical training system must be flexible and capable of continuous innovation.**

Depending on the country and its political choices, management models may take different forms. Regardless of the choices made, however, the administrative apparatus must ensure that the expected results are achieved at both the quantitative and qualitative levels. In this perspective, the different components of the system must interact effectively in the pursuit of common objectives. There are at least three levels of management structures:

- In the first level, the government—whether a ministry or another agency—acts as the **architect** of vocational and technical training. It is responsible for planning and organizing training in a given territory, developing programs of study, and funding, monitoring and evaluating the system.
- In the second level, **partnerships** with the other ministries or organizations coordinate the different sectors of vocational and technical training.
- The third level involves the management of the training **institutions** themselves.

Figure 5 Establishment of an administrative apparatus



5.1 Management structure of the architect

Responsibility for overseeing vocational and technical training can be assumed by a ministry devoted exclusively to this type of training or a special administrative "unit" under the responsibility of the ministry of Training or another ministry. What is important to remember here is that, **if responsibility for vocational and technical training can vary, taking into account the different characteristics of a country, the governance unit must be specified and confirmed.** In this document, the central agency to which the State delegates responsibility for vocational and technical training is referred to as the "architect."

The architect plays a leading role in overseeing the system for which it is responsible. It is responsible for its planning, effectiveness, efficiency and consistency with the needs of the country and its regions. It ensures that it is harmonized with the other training sectors. It also ensures that it is adapted to the economy and the needs of the labour market, whether formal or informal, private or public.

Even if the system chosen is decentralized, for example, by delegating responsibilities to government agencies or even private training firms, the architect is responsible for the governance unit and, therefore, for the consistency of the system. Thus, the architect appointed by the State is responsible for planning the services to be offered to the population, for developing, organizing and financing these services, and for monitoring and evaluating the system. It must therefore have the means of carrying out this mission, in accordance with the orientations defined and the decisions made with its principal partners.

5.1.1 Design and orientation of the system

Whatever the country, vocational and technical training models always revolve around two axes: training and employment. Consequently, the design and orientation of the system must fall within the boundaries of the major orientations and government priorities that foster the development of human resources through the promotion of competencies and skilled occupations. In fact, the sustainable development of vocational and technical training requires sufficient time and resources that can only be ensured if it is included in the government's strategic planning. By and large, the upgrading and use of competencies cannot contribute to economic reform if they are not a government priority.

In this sense, it is important, on the one hand, to define how vocational and technical training fits into the education and training systems. On the other hand, it is important to ensure the development of vocational training through effective mechanisms that allow labour market needs to be observed and identified both qualitatively and quantitatively. The effectiveness of such a system will depend on its ability to identify emergent needs resulting from technological changes and new work organization methods as well as labour needs in more traditional sectors.

A. *Role of vocational and technical training in the education and training systems*

The laws described in the previous section have already situated vocational and technical training with respect to education in general. The idea here is to determine the relationship between general education and vocational and technical training on the one hand, and between training in the youth sector and in the adult sector on the

other. Admission dates and requirements, registration dates, basic school regulations and the recognition of prior learning or competencies are some of the elements to be determined.

Many countries have opted for a vocational and technical training system that both ensures personal development and promotes economic development. This dual objective in vocational and technical training is always the subject of debate, and the importance given to one or the other of these axes varies depending on the country. It is the State's responsibility to define the orientations; the architect will see to the implementation of a system with the desired emphasis for each, particularly in terms of program development.

Whatever choices are made, however, **today's world demands quality vocational and technical training that:**

- is related to the labour market and is **competency-based**
- is based on a **broad and solid basic training** that allows for the transfer of learning and the pursuit of further training
- integrates **versatility** and **the ability to learn how to learn**
- fosters the **development of attitudes** such as autonomy, a sense of responsibility and the ability to work in a team

These are the characteristics of successful vocational and technical training programs that promote integration into the work force and job mobility.

These characteristics lead to the definition of high-level goals and general objectives for vocational and technical training, goals and objectives that go beyond a utilitarian or limited view associated with mere job preparation.

B. *Labour market analysis*

The close ties that exist between training and employment require that the architect of vocational and technical training have access to relevant data on the labour market. This is one of the essential dimensions in terms of its mission of ensuring consistency between the two axes. The data gathered will allow the architect to react rapidly by modifying existing programs or developing new programs in response to the more qualitative needs expressed by representatives of the labour market and socioeconomic partners. The data also make it possible to set or revise target enrollments by program and region in order to meet the quantitative needs of the labour market.

However, while the architect must have access to data and be able to decide which data it needs, it is not necessarily solely responsible for its collection. The ministry of Employment is usually responsible for implementing mechanisms for labour market observation and analysis. What is important in terms of vocational and technical training is the architect's ability to direct the gathering of information and to refine its analysis over the years.

Employment data can be gathered at the central government level. In fact, centralization is necessary if there is to be an overview of the situation. In some countries, certain regions also have information about their own economic development. The agencies responsible for this mission are often referred to as **"employment observatories."**

Because of the changes due to globalization, some countries have even started implementing "strategic watch" mechanisms. The idea is to use modern management and information tools and techniques to optimize the labour market observation

and analysis process. These techniques are now being tested in sectors in which the speed of technological and organizational change requires that data and information about qualitative and quantitative work force needs be updated in real time. These new means complement conventional observation and research methods, i.e. sector studies and socioeconomic analyses.

Labour market data—gathered and compiled by employment observatories, government authorities, strategic watches and the architect of vocational and technical training—is the raw material on which the architect will base its program development. The labour market analysis is therefore a basic component in the programming of activities.

5.1.2 Strategic planning

A vocational and technical training system cannot be implemented or reformed unless it is a government priority supported by medium- and long-term strategic planning.

This planning is necessary because of the complexity of the project, the diversity of partners involved (at the national and international levels), the magnitude of costs, the scarcity of competent human resources and the time required for training or professional development. This huge project can itself be broken down into several smaller projects such as:

- designing and implementing a mechanism for observing labour market needs
- designing or revising hundreds of programs of study according to a competency-based approach
- training or providing professional development to hundreds, if not thousands, of teachers and managers of training institutions, as well as of system managers
- building or renovating dozens of vocational or technical training centres and implementing new programs of study
- designing and testing a training-employment correlation model and establishing a map of options
- developing a funding model incorporating State and private enterprise and searching for funding

Each of these projects involves many steps, requires the participation of a number of experts from ministries, government agencies, the private sector and the labour market in general, and calls for considerable material and financial resources.

Although all of the projects can and should be carried out concurrently, they must be part of a whole and must be coordinated by the architect to ensure consistency and the ability to answer to the government and national and international partners with respect to the progress of the overall project and to make any necessary readjustments.

In a democratic system, the strategic role of the State and its leadership cannot be questioned. For reasons of access to training and social equity, the State has become training's main financial backer. Moreover, today, education and training are seen as an investment that will benefit all of society. In the context of global competition, everyone is agreed that societies must rely on the development of their human resources, which means that education and training must remain a political and budgetary priority for the State.

Vocational and technical training is truly a government priority when its development is the subject of long-term strategic planning in harmony with the State's economic, social and educational development policies.

5.1.3 Programming of activities

The programming of activities includes two main dimensions: program development and training-employment correlation.

A. *Program development: Qualitative aspects*

Once the data on the labour market have been gathered, the architect of vocational and technical training oversees their processing and conversion into programs and program offerings. It must expand upon the information, adding details. **A careful analysis of tasks and responsibilities entrusted to practitioners of a given occupation is necessary in order to establish the competency profile and the program of study.**

A similar process for each of the different sector studies will make it possible to group together programs of study with similar competencies, and to ensure their integrated management. Among other things, this approach favours the recognition of prior learning, the harmonization of programs and the establishment of gateways from one level to another.

This translation of labour market needs into competencies to be developed by learners is a complex, precise process resulting in a thorough and lengthy design process. This is why it is important to establish a methodological framework for the development of programs using a competency-based approach and to develop a higher level of expertise through the participation of an architect, integrating all vocational and technical training sectors. This framework is the subject of the section devoted to program development.

B. *Training-employment correlation: Quantitative aspects*

There are also quantitative objectives, i.e. the determination of the number of individuals to be trained in each occupation throughout the country, and in each region. In training, this is referred to as the "map of options."

It is the government's responsibility, through the architect and the ministries or agencies involved in vocational and technical training, to meet the need for educational services. Access to quality educational services is as important in vocational and technical training as it is in basic general training. Within the stated limits, in particular with respect to available resources and labour market needs, it is important to open up vocational and technical training to as many people as possible: it is an effective means of preparing for the labour market and ensuring financial autonomy.

Access to vocational and technical training finds concrete expression in the number of programs offered, the number of places available and the geographical location in which the programs are offered. Obliging young people who live far from a large urban centre to leave home to earn a diploma could contribute to the exodus from these regions, and require the implementation of a student assistance program. It is also difficult for adults to study outside their region, among other things, because of family constraints. The map of options therefore takes into account a number of variables, including those related to the capacity of the vocational and technical training system itself.

Although it might not be possible to accurately determine the exact number of new graduates needed in each occupation

and each region, an effort must be made to avoid imbalances that would result in the unemployment of some graduates because too many received training, or in a number of positions remaining vacant because of a lack of a sufficiently large qualified work force.

To achieve balance, and thereby optimize the vocational and technical training system, a model must be implemented to correlate training with employment. In particular, this model should include establishing a process for authorizing a given program of study. Indeed, given the information about the size of the work force needed for each trade or occupation in each region, and within the boundaries of the economic development objectives adopted by the regional authorities, the architect must authorize a limited number of educational institutions to offer a given program of study. Some programs may be offered by almost all educational institutions, while others will perhaps be limited to one institution per region and yet others, if the need is extremely limited, to one institution in the entire country.

The analysis model for correlating training and employment is presented in detail in Part 2 of this series entitled *The Central Management of Training*. Its aim is not only to seek optimal use of the resources of the State and its partners, but more particularly to promote the successful integration of graduates into the labour market, all the while maintaining the fragile balance between supply and demand in terms of human resources.

5.1.4 Funding of the system

The implementation and operation of a vocational and technical training system require considerable financial resources. Some solutions are more costly than others for the State. Total control of the vocational and technical training system is the most costly model for the government and has recurrent financial consequences for its budget. Admittedly, few countries have the means to adopt this model and those that took this route a number of years ago are looking to have businesses take on part of the cost. Conversely, a vocational and technical training system that is entirely funded by the private sector is at the mercy of the immediate goodwill of businesses and private training agencies, which usually favour the least expensive types of training (merchandising and sales, for example). Moreover, this type of funding limits the role of the State with respect to the quality and consistency of the system, as well as access to training. Between these two extremes, there is undoubtedly a happy medium, since no vocational and technical training system could meet the expectations of its users if it did not have the necessary funds.

One option is to share the cost between the State and the main user of the service, i.e. the country's production system. Businesses can contribute, for example, via a payroll tax. Costs could be covered in part by users, i.e. students. Each solution has advantages and disadvantages. Charging tuition fees can only go so far if one considers the ability to pay of the majority of students enrolled in vocational and technical training. Relatively high tuition fees would immediately exclude a large number of individuals from the system. This is why private training agencies rarely venture into sectors with heavy installation and operating costs. The tuition fees they would have to charge their students would quickly put an end to them.

A payroll tax affects only businesses in the formal sector. In return, it requires that vocational and technical training be considered part of continuing training, and thus opens the door to integrating the youth and adult sectors. Obviously, the different aspects of vocational and technical training orientations and policies are interrelated: a decision concerning one aspect has an impact on another. That is why the reform of vocational and technical training often consists in an overhaul of the very foundation of the system.

The greatest challenge involved in reforming an education system is to implement a mechanism for the recurrent funding of the system in order to ensure its survival and development. Many vocational training centres on the cutting edge of technology have become obsolete because they lacked the means to train their teachers, and maintain and upgrade their equipment.

At international forums, there is increasing talk of developing a "maintenance culture." This cannot happen if regional authorities and managers of institutions offering vocational and technical training do not have the necessary financial means. In Part 2 of this series entitled *The Central Management of Training*, we will discuss the basic components of a funding system for vocational and technical training based on the replacement cost of tools and equipment and on operating costs resulting from the use of raw materials in instructional activities. This system takes into account the relative weight of the different programs of study with respect to costs, the number of enrollments and the duration of training, the objective being to ensure that educational institutions receive appropriate and fair funding.

5.1.5 Continuing evaluation of the system

The architect of vocational and technical training, whether it is a ministry or a government agency created for the purpose, must establish a management structure for at least three functions:

- strategic orientation and planning
- financial management and the allocation of resources
- evaluation of the system and accountability

Since it is responsible for the direction of a public service, established on the basis of the government's choices and priorities and often heavily funded by the State, the architect must see to the quality and consistency of the system, and to cost control, even if the private sector is involved.

Cost analysis is a public evaluation of the system's efficiency, that is, the relationship between the resources allocated to it and its performance. This part of the evaluation of the system is based on reliable and widely available quantitative data, so it is relatively easy to implement although it requires considerable material and informational resources.

The quality and effectiveness of the system are more difficult to measure. What indicators can be used to evaluate the quality of the system? It is a challenging question. Evaluation, however, must be considered a tool for improvement and development and be valued by all players in the system. It must therefore exist at both the central and the local levels and must solicit the participation of all players by encouraging each educational institution to adopt an evaluation policy.

The system can be regulated by implementing and using a centralized database.

This database is indispensable for developing indicators that will be used to assess the condition and evolution of the system. Some of these indicators could include:

- **for programs of study:** number of students enrolled, number of graduates, dropout rate, rate of integration into the labour market, number of teachers, list of teachers' competencies
- **for the regions:** distribution of programs, enrollments, investments; training-employment correlation; retention of local work force
- **for funding:** source of funding, geographical distribution, distribution by program of study, estimated costs, real costs, investment-graduate ratios

A centralized database will be useful insofar as it integrates data from other vocational and technical training sectors if other partner ministries and agencies also offer programs or training activities. It gives the architect of vocational and technical training the information it needs to gain an understanding of the system and to act with a view to ensuring its effectiveness and efficiency, for the benefit of the State and society in general.

5.2 Management structure of partner ministries and agencies

5.2.1 Partner ministries

In a number of countries, sectoral ministries, such as Agriculture, Fisheries, Tourism and Health, have taken charge of vocational and technical training for certain trades or occupations in their sector of economic activity. Over the years, these ministries often developed their own programs of study. Some of them created specialized educational institutions and award their own diplomas. **If the system is not regulated, this can lead to the existence of different qualities of vocational and technical training programs and diplomas, the lesser ones diminishing the value of the others, affecting the reputation of the entire vocational and technical training system.**

The reform of a vocational and technical training system is an opportunity to harmonize the various components of the system, while increasing the value and effectiveness of training. For this reason, some centralization is necessary, if not indispensable, since it is important that all programs of study be integrated into the system, regardless of the occupation involved and the agency or ministry dispensing them. **A vocational and technical training system can be effective and consistent only when all the programs of study share the same ultimate goals and quality standards.**

As mentioned earlier, this consistency is achieved when the same approach and methodological framework are applied to the development of every program of study. **The system's strength lies in the consistency of the programs of study and the development of competencies, as defined in close collaboration with representatives of the labour market.** The aim is to have all programs of study, even if they are offered in educational institutions under the jurisdiction of different ministries, lead to the same type of diploma or certification.

Remember, too, that the strength of a vocational and technical training system relies on the existence of a shared database containing qualitative and quantitative data on the occupations in question, targeted

enrollments and the integration of graduates into the labour market.

The need for a consistent and strong vocational and technical training system is one of the reasons why many states now opt for a single architect, whether it be a ministry or agency, responsible for the management of vocational and technical training programs.

5.2.2 Continuing vocational and technical training

We have seen that vocational and technical training focuses on the relationship between training and employment. Because of the evolution—or instability—of the demand for skills in the labour market, vocational and technical training programs of study must constantly evolve to ensure that they meet the needs resulting from the economic and social development of the country or region, and graduates must constantly upgrade their competencies and sometimes even develop new ones. The vocational and technical training system will therefore be more effective if it can adapt easily to the constant evolution of training needs.

This is why there is a need for considerable flexibility in the management of the vocational and technical training system in general and in program design in particular. A common strategy for program development is **"modularization."** Based on the competency-based approach to program design, modularization makes it possible to partition a single qualification into a series of operational and certified competencies corresponding to national or international standards. The idea of using modules as program components facilitates the development or modification of programs of study. **If a program of study is based on a coherent set of competencies required to develop a desired qualification, changing one or more modules in the program is all that is needed to adapt to changing needs.**

In the same vein, graduates have only to take one or more modules of the program in order to upgrade their knowledge and skills. Flexible program management means a flexible system in terms of the diversity of needs. Indeed, **the main advantage of the modular approach consists in the construction of individual portfolios of competencies**. In terms of "lifelong learning," this approach has the advantage of allowing individuals to return to vocational and technical training from time to time in order to acquire new competencies or to validate competencies acquired through a variety of means, such as apprenticeship or in-company training, or competencies acquired in another country.

The modular approach also facilitates career changes by opening up the labour market for graduates since they have developed a number of transferable competencies and can, at any time, acquire the remaining competencies they need to qualify to practise a related occupation or even an occupation in another sector of activity. This potential mobility is the source of employees' professional autonomy.

The integration of initial and continuing training is in keeping with the objectives of a highly flexible system, more effective vocational and technical training and the optimization of training costs. The concepts and instructional engineering tools used in the competency-based approach are based on the training and the competencies required to practise a trade or occupation,

and not on the needs and characteristics of enrollments.

While the competency-based approach is an integrated approach that does not distinguish between young people and adults, **special services** can be offered to adults, including:

- consulting services
- financial assistance programs (to encourage those receiving employment insurance or income security benefits to return to school)
- training of homogeneous groups (numbers permitting)
- schedules adapted to people with family responsibilities

This involves a reorganization of vocational and technical training for adults rather than the development of special programs of study.

Some of these organizational and financial arrangements, particularly in the case of adults, will be the responsibility of educational institutions or of the ministries or agencies responsible for employment or social solidarity. Responsibility for continuing vocational and technical training is often shared by several partner ministries and agencies.

Here, the role of the architect of vocational and technical training is to:

- make available a network of specialized educational institutions to its partners and to the public
- produce the vocational and technical training programs needed to train the work force in every sector of socioeconomic activity according to a competency-based approach
- delegate to regional authorities and educational institutions the responsibility of meeting the needs expressed by its socioeconomic partners

It goes without saying that the architect plays a major role in the national and regional planning of continuing training program offerings, in close collaboration with the partner ministries responsible for employment, social security and so on, although the regional authorities and educational institutions play a more important role in decentralized systems.

5.3 Management structure of educational institutions

Whether they are called schools, institutes or centres, educational institutions offering vocational and technical training are in the front line, where training is actually dispensed. It is in these institutions that everything comes together—all the stages involved in the planning and design of vocational and technical training program offerings described above, as well as all the efforts made by the government and its partners to reform the training system. Every time a person leaves an educational institution with a diploma and an occupation, and can integrate into the labour market and self-actualize, the training system has been successful.

But this does not follow naturally. If the vocational and technical training centre is to fulfill its mission, it must have the human and financial resources needed to meet the expectations of its partners and its students. Directors and managers must also have sufficient autonomy to make the necessary

choices depending on the educational institution's situation and environment.

If it wants to, and if the orientations of the system are so designed, the State can encourage development of an entrepreneurial culture by delegating more responsibility to boards of directors or governing boards made up of directors and their local or regional partners. The major structures set up by the State, whether instructional, financial or organizational, need to be precise in order to guarantee the quality of training and the comparability of diplomas, and to ensure the equitable sharing of resources among regions and educational institutions. A certain flexibility is nevertheless necessary to allow the regions and institutions to take into account their particular characteristics and to offer services adapted to local needs and priorities.

The implementation of training in a vocational training centre is a complex and diversified process that calls upon an extremely broad range of competencies. It goes without saying that teamwork is essential and that it constitutes the very key to success. In addition to their most obvious functions, i.e. the development and organization of training, educational institutions are also responsible for human and financial resources management, which becomes much more important, even strategic, when the State delegates all or part of this responsibility to the local authorities.

A flexible vocational and technical training system that encourages the contribution of all its players, in particular those close to the educational institutions, **must give the directors of these institutions a certain amount of management autonomy** with respect to:

- managing and organizing training
- managing human resources
- managing the development of the educational institution

The following sections touch briefly upon the roles and responsibilities of managers of educational institutions. Part 4 of this series on the reform of a vocational and technical training system, entitled *Program Implementation at the Local Level*, discusses the subject in detail.

5.3.1 Managing and organizing training

Managing and organizing training in an institution offering vocational and technical training can affect several aspects such as program implementation, the organization of training, the calendar of activities, material resources and services to the community.

A. *Program implementation*

In a system with relatively autonomous educational institutions, the implementation of programs of study developed according to a competency-based approach is the responsibility of the vocational and technical training centre. This represents the delegation of a major responsibility by the State to the centre. In fact, in a competency-based approach, the program or training repository does not dictate the content or subjects to be taught, or the teaching strategies to be used. Rather, it specifies the results expected at the end of the learning period, in terms of observable and measurable behaviours. It is therefore up to the administration of the institution and its team of teachers and, ideally, an education consultant, to determine the means of attaining the targeted objectives.

Similarly, the evaluation of the students' mastery of the competencies requires the use

of new strategies and means by teachers, education consultants and administrators. This is also an important local responsibility, whose management should be standardized, and whose methodology should be validated by evaluation specialists and approved by the governing board. **It is a question of defining a *policy for the evaluation of learning* guaranteeing the validity of the certification of studies and of the diploma. The credibility of the educational institution and the system depend on it.**

B. *Organization of training*

The organization of training goes hand-in-hand with program implementation and also requires a fair amount of planning and innovation. A vocational training centre serving its community and responsible for its development will make an effort to offer quality services and to customize these services when necessary. The process of recruiting and admitting students, for example, should be transparent and fair. Transparency and fairness translate into clearly defined and disclosed admission requirements, so that all those who meet these requirements have an equal opportunity to undergo the training, regardless of gender or religious or racial affiliation.

If space is limited and selection criteria are added to the general admission requirements, they must also be clear and disclosed to all candidates, and have been the subject of a governing board resolution. This is to avoid the arbitrary judgment of a single person or group, and ensure the quality and accessibility of training.

C. *Calendar of activities*

The calendar of activities and course schedules can be drawn up to take into account the centre's capacity and labour market needs. In this way, it is possible to spread student practicums in the workplace out over the calendar year and to stagger the arrival of new graduates on the labour market in two or three key periods. The latter strategy is also likely to help students integrate into the labour market.

For the educational institution offering vocational training, this type of school calendar makes it possible to obtain a better return on investments by increasing the level of use of the institution which, otherwise, could remain idle for long periods of time. This involves basic operational changes, for which it would be preferable to obtain the support of staff members, in particular teachers.

D. *Material resources*

Considerable material resources are required to dispense vocational and technical training programs. The organization of training activities requires planning and the acquisition of raw materials, furniture and equipment, instructional materials and technological tools. The fewer the resources, the more inventive the administration of the educational institution will have to be to find new ways of ensuring the achievement of learning objectives. Taking advantage of partnerships with businesses in the region is one possible strategy to partly bridge the gap between needs and available resources. The development of a true maintenance culture in the institution, which will help reduce operating and maintenance costs, is another.

E. *Services to the community*

Educational institutions offering vocational and technical training can also find a significant source of funding in providing businesses and organizations in their

community with customized professional services. Patterned along the lines of a successful private company with respect to management, vitality and profitability, a *Business Services* department could sell customized training activities or any other professional service related to work force training.

5.3.2 Managing human resources

Managing an educational institution offering vocational training is a complex activity that will have a better chance of success if the institution has considerable leeway in determining hiring criteria for teachers. In a competency-based approach, learning is based on the ability to carry out the main tasks of a given occupation. The training must reflect the real work situation as much as possible, and learning is evaluated by means of a concrete demonstration of the students' mastery of the targeted competency with respect to the performance criteria required for entry into the labour market. In this context, the quality of training relies, among other things, on the quality of teachers, who must first be recognized as experts in the field in which they are imparting knowledge. They must also be educational specialists in their field or taking steps in that direction.

The success of the institutions' educational project and the quality of training offered rely heavily on this twofold expertise, which is most often developed over time. Consequently, it would be helpful to provide mechanisms for the continuing training of teachers in order to help them keep their competencies up to date, at both the technical and pedagogical levels. The collaboration of the business community, in particular in offering refresher training in the workplace, would be helpful, since the most successful businesses are most often the ones on the cutting edge of new technologies, integrating them into their manufacturing or production processes.

Administrative staff, support staff and non-teaching professionals must also be selected in accordance with the specific needs of the institution. These needs are obviously closely related to the institution's educational projects and development objectives.

5.3.3 Managing the development of the educational institution

Promoting vocational and technical training in the region in which the educational institution is located, creating rich and diversified relationships between the school and the business community, managing educational success and evaluating the organization are but a few aspects that require ongoing effort in keeping with the orientations adopted by the governing board. Included in the institution's strategic planning and translated into operational objectives in an annual or three-year action plan, these orientations guide the institution's daily actions and its development in the community.

Managing the development of an educational institution offering vocational training is a relatively difficult task for administrators, who are generally occupied with putting out fires in order to ensure the institution's day-to-day operation. It takes many years of experience to learn how to temporarily put aside requests, all of them urgent, to consider the future and think about the development and growth of an organization.

Fortunately, the development of an organization and the formulation of a vision

for service to the community are not accomplished in a vacuum. Partnerships with the community and teamwork will make it possible to gather different opinions and facts concerning regional development, employment development, graduate placement rates and demographic data on potential enrollments. Awareness of the public's expectations and of regional work force needs will make it possible, for example, to justify to the architect of vocational and technical training a development plan for the map of options (program authorizations), a request for authorization to increase the number of enrollments in a given program of study, an expansion of the institution, or a special investment.

Diversity of representation on the institution's management committee and a balance between outside representation (e.g. employers, social groups, unions) and internal representation (students, teachers, administrators) will ensure that the strategic plan and the action plan, while resolutely facing the future and the development of the institution, respect the mission of the institution and contribute to the development of a unique organizational culture.

SUMMARY

The "administrative apparatus" for the vocational and technical training system is made up of a series of management structures that translate policy into action. These management structures focus on a single **architect**, which is responsible for overseeing the planning and organization of training throughout the territory, the development of programs of study, and the funding, monitoring and evaluation of the system. The architect also ensures the consistency, effectiveness and efficiency of the system. There must be a governance unit, and the architect must have the means of ensuring its existence.

The architect sees to the design and orientation of the system, particularly in the relationship between general education and vocational and technical training and in the relationship between the training of young people and adults, but especially in the development of programs based on an analysis of the labour market. The architect is also responsible for the development of programs of study and their correspondence to labour market needs. It sees to both the qualitative and quantitative aspects of the system. It decides where a program of study will be offered and how many students can enroll: this is one of the factors governing access to education. Funding and the continuing evaluation of the system are also the responsibility of the architect.

The administrative apparatus for vocational and technical training may involve a second level. The management structures can, in effect, include **partnerships** between the architect and other ministries or agencies also affected by vocational and

technical training. At that point the governance unit ensures the consistency and quality of the system.

Whether they are called schools, colleges or centres, **educational institutions** offering vocational and technical training are in the front line of program implementation, where training is actually dispensed. As the final level of the management structure, educational institutions are responsible for the educational management of programs under the leadership of directors, with the collaboration of teachers and support staff. A certain amount of autonomy is required if vocational and technical training is to be adaptable to local and regional realities.

CONCLUSION

The reform of the vocational and technical training system is a process that requires thoroughness, as this document illustrates. Reform requires a review of the entire system and its reconstruction in accordance with the priorities and sociopolitical commitments determined by the State in conjunction with its different partners. Such reconstruction would be impossible without redefining the role of the sector in the training system and the economy. Vocational and technical training is an integral part of the training-employment relationship, and neither its consistency with the country's needs or its development and continuing adaptation would be possible without the firm direction of the State. The consistency, strength and fairness of the system depend on it. In this sense, it is up to the State to define the orientations and determine the mechanisms for regulating the system. This direction will be all the more effective if the criteria and indicators needed to evaluate the quality and effectiveness of the system are determined at the outset so that the necessary adjustments can be made.

In its reform, the State may choose a wide variety of structures and operating methods, adapted to the history, culture and socioeconomic situation of the country at the time. Different choices can be made concerning centralization or decentralization. In all cases, the State is responsible for regulating the system, which in itself implies a certain degree of centralization, in particular with respect to orientations, policies, databases, program approval, the map of options and the continuing evaluation of the system. Direction is more likely to be effective when there is a single architect of vocational and technical training that oversees the entire system, even if certain dimensions are delegated to partner agencies.

Through its architect, the State ensures that the vocational and technical training system is adapted to the economic development of the country, since an effective and efficient system must adjust to market demand. This demand is, of course, current, but also potential: the availability of a qualified work force is also a means of attracting businesses, and their establishment contributes to the socioeconomic development of the country.

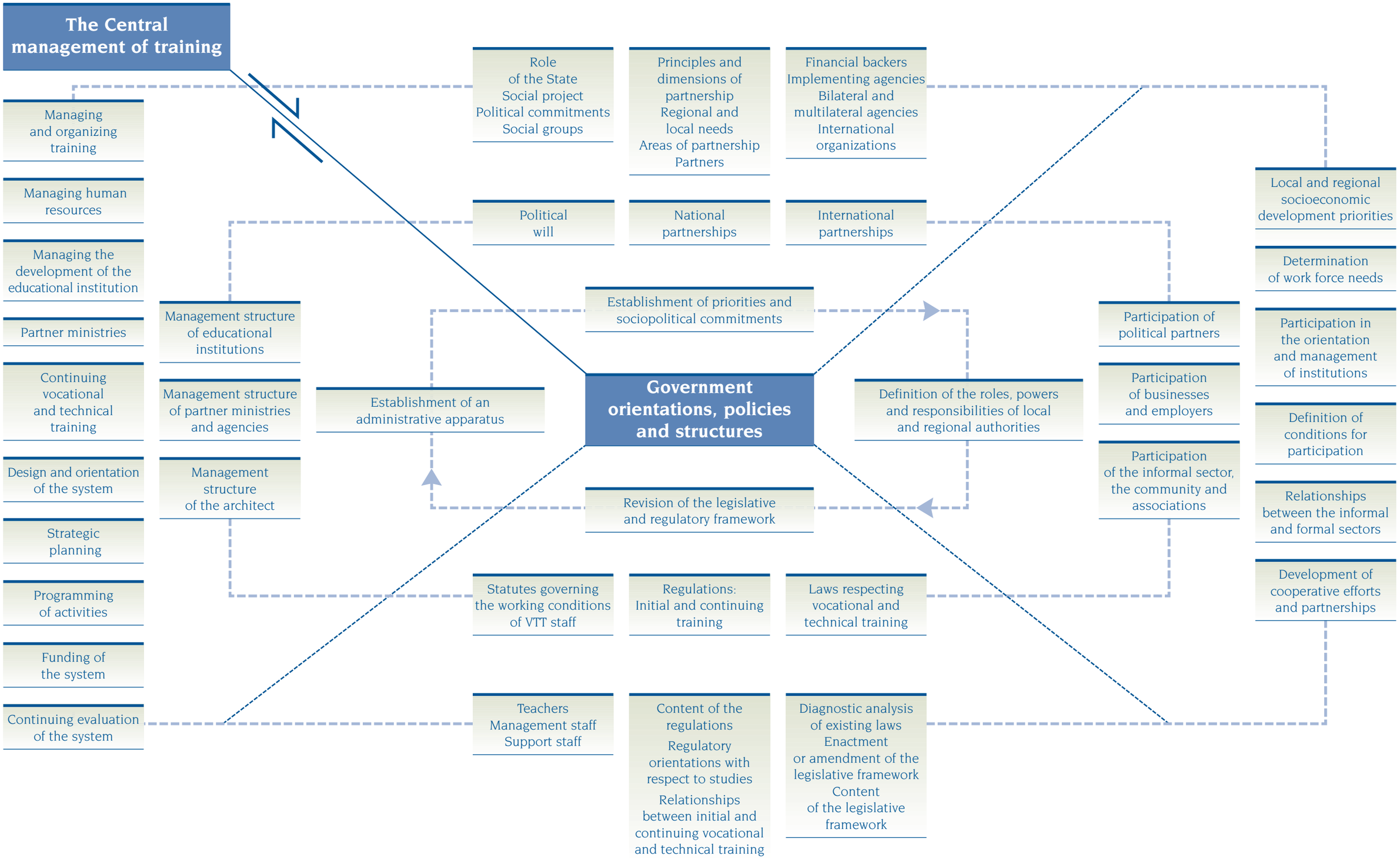
Please note that this document is one of a series of four, including *The Central Management of Training*, *Program Development* and *Program Implementation at the Local Level*.

GLOSSARY

Term	Definition
Architect	The government authority responsible for vocational and technical training.
Educational engineering	Set of techniques and methods used to design, develop, implement, teach and evaluate a program of study.
Institution	Generic term referring to a place where vocational or technical training programs are offered.
Organization of training	Equivalent of educational organization in institutions offering basic education.
Prevocational training	Training that usually follows the end of the cycle of basic education (nine years) and that constitutes an introduction to the workplace through a range of occupational activities. Essentially organized to prepare young people to select a career or branch of training by familiarizing them with the materials, tools and standards related to a range of occupational activities (ILO, 1987).
Technical and vocational training	Involves, in addition to general education, technical training and the acquisition of practical knowledge and competencies related to the practice of certain occupations in various economic and social sectors (UNESCO, 1978).
Technical training	Training in the second cycle of secondary school and the first cycle of postsecondary education for intermediate personnel (technicians, middle managers, etc.) (UNESCO, 1978). Intended to prepare the student to practise a trade or occupation.
Vocational training	Structured training system designed to provide individuals with the knowledge and competencies needed to practise a specialized trade with a view to entering the labour market.

APPENDIX

Reference card



The engineering of vocational and technical training

The central management of training

The central management of training

1 Introduction

A country's vocational and technical training (VTT) system is based on laws and regulations resulting from government orientations and priorities.[1] The implementation of an effective competency-based vocational and technical training system requires planning on the part of the State, in collaboration with its principal partners. Such a system cannot be based solely on local initiatives and abilities, since its successful implementation requires means and expertise that only a government can provide. Consequently, it is essential that a management unit be able to take over the important function of "architect" in defining, planning and supporting the development of vocational and technical training. These major functions are referred to here as the central management of training.

In the context of centralized management, a series of activities are carried out in order to:

- analyze the labour market in order to establish program offerings that meet its needs at both the qualitative and the quantitative level
- plan program offerings, i.e. the appropriate pedagogical intervention strategies for each program of study, the resources needed to implement the programs and the related admission requirements
- organize training at the national level, taking into account potential sources of funding, the necessary physical and material resources, the resources available in the educational institutions and in any businesses involved, and the professional development needs of the staff responsible for implementing and dispensing the training
- monitor the evolution of the vocational and technical training system and evaluate its effectiveness and efficiency, in particular with respect to graduates' entry into the labour market and the system's general ability to meet work force needs at the local, regional and national levels

The *central management of training* comprises four main components:

1) labour market analysis
2) planning of program offerings
3) organization of training at the national level
4) monitoring and evaluation of the VTT system

[1] See Part 1 of this series entitled *Government Orientations, Policies and Structures*.

Figure 1 The central management of training

2 Labour market analysis

Labour market analysis usually falls to the ministry responsible for employment or its equivalent. Essentially, analyzing the labour market consists in gathering the most pertinent information possible about work force needs, in both qualitative and quantitative terms, and evaluating it with a view to obtaining greater consistency between supply and demand. This information usually concerns existing trades and occupations, sectors of economic activity, the characteristics of businesses and economic conditions (trends, issues and priorities). This information is then usually compared with the characteristics of the work force (employment and unemployment rates) and the socioeconomic profiles of the regions in order to determine work force development needs. Ideally, the labour market analysis should be designed and adapted to take into account requirements for the planning of initial VTT program offerings and the concerns of those responsible for the central management of training at the ministry of Education or the ministry of Vocational Training. If, however, definite connections cannot be made between the labour market information gathered and initial training needs, the ministry responsible for vocational and technical training may have to create an interface to link economic analysis data with the development of initial training, making it possible to use the quantitative employment data needed to plan and develop programs of study and organize training.

Since the objective of vocational and technical training is to contribute to students' autonomy by helping them develop the competencies needed to practise a trade or occupation, training focuses on integration into the work force. Programs of study must be adapted to the labour market situation in order to meet businesses' need for a qualified work force.

2.1 Labour market observation

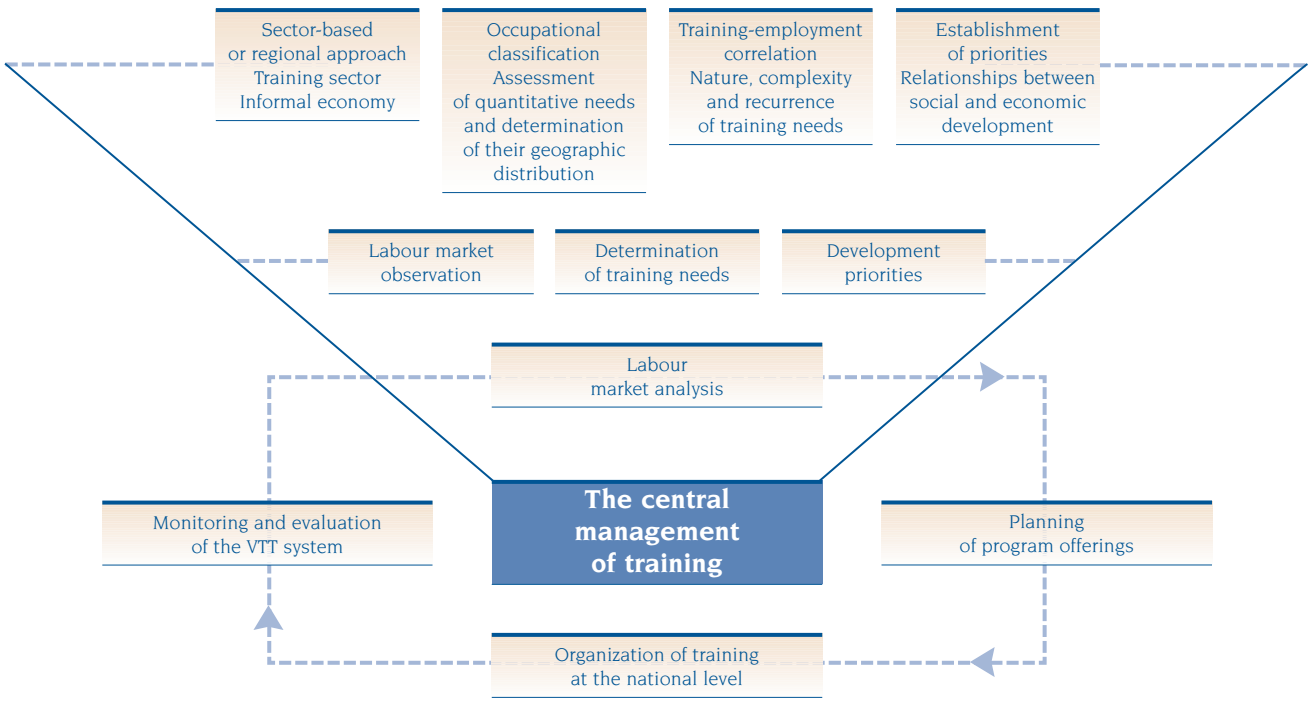
In order to ensure the greatest possible consistency between training and employment, the agency responsible for developing program offerings must be aware of the labour market situation throughout the country and in the different regions. More specifically, it must be familiar with the structure and evolution of the demand for occupational competencies.

Being familiar with the structure of the labour market means knowing how jobs in each trade or occupation are distributed among the different sectors of economic activity throughout the country and in its regions. Being familiar with the evolution of the labour market means being aware of projections concerning growth and changes in job structure (quantitative aspect), as well as the evolution of needs with respect to the competencies required for each trade or occupation listed (qualitative aspect).

In general, two approaches are used to observe the labour market and obtain information about its structure and evolution: the sector-based approach and the regional approach.

The **sector-based approach** consists in studying the organization and development of a sector of activity or a grouping of economically similar activities. To this end, a country may set up research departments to develop a profile of the socioeconomic sectors in question. These profiles will help describe the national economy and determine the contribution of the different sectors by describing the businesses in each

Figure 2 Labour market analysis



sector and providing information about their evolution, their strengths and weaknesses, and the issues involved in their development. Finally, socioeconomic sector profiles usually contain basic information about the trades and occupations represented, the characteristics, competencies and career prospects of the work force, and the vocational and technical training programs leading to the practice of these trades and occupations.

The implementation of a competency-based vocational and technical training system requires an in-depth knowledge of work force needs, at both the qualitative and the quantitative level. Only then will the authorities be able to develop relevant programs of study, that is, programs that meet the need for competencies expressed by representatives of the labour market for each trade or occupation, and program offerings in line with work force needs (quantitative correlation) in each sector and region. The program development process therefore begins with the establishment of training sector profiles.[2]

Training sector

Training sectors are based on groups of programs and, consequently, on the groups of trades and occupations to which they lead, since formal connections must be made on the basis of similar competencies. For example, the Administration, Commerce and Computer Technology **training sector** cannot be considered a **socioeconomic sector,** since the programs it contains lead to occupations practised in most if not all socioeconomic sectors. It is, however, a useful category precisely because it groups together, for training purposes, trades or occupations that exist in almost every business. Among other things, the creation of training sectors makes it possible to group together the work force needs of businesses in very different economic sectors for similar occupations, and to establish more consistent and effective program offerings. Thus, the quantitative and qualitative work force needs for secretarial positions will be analyzed, not for each of the different socioeconomic sectors, but for all sectors and businesses combined. It goes without saying that this does not preclude identifying and meeting more specialized needs for the same occupation in certain sectors (e.g. medical or legal secretaries). Other training sectors are almost indistinguishable from their corresponding socioeconomic sector (e.g. mining, agriculture). Training sectors should not, however, be confused with socioeconomic sectors, which are generally groupings of businesses according to the product manufactured, the type of material processed (e.g. woodworking and furniture making, plastics processing) or the service offered (e.g. tourism, health).

In a **sector-based approach**, a government can, in collaboration with its socioeconomic partners, choose to analyze a limited number of priority sectors. All government efforts, as well as those of the socioeconomic partners, can then be mobilized around an integrated sectoral development project with a view to improving the collective well-being. In short, a country's program offerings are highly dependent on the government's orientations with respect to sectoral economic development, which are often subject to pressures

[2] See Part 3 of this series entitled *Program Development*.

inside or outside the country. Priorities can be related to large-scale private investment projects or a structural adjustment program favouring the development of selected sectors.

In the **regional approach**, the aim is to establish a profile of the businesses in a given region, or of a representative sample thereof. The profile consists of a description of the businesses surveyed and their activities, and details about the number of employees, job titles, types of positions, hiring and layoff prospects, needs in terms of specific competencies, recruitment difficulties, and so on.

Every country has an **informal economy.** Often referred to as the *informal sector*, the informal economy comprises activities involving the production of goods and services that take place outside the official economy governed by the State.

Although it is not a direct source of income for the State, the informal economy contributes to economic activity and allows a more or less significant segment of the population to earn a living.

The informal economy can play a major role in certain sectors of economic activity. If the State wishes to meet training needs in the informal sector, it must develop tools to gather sufficient information about the employment situation in the sector. This often entails using an empirical approach based on individual interviews, surveys, questionnaires, polls or discussion groups to help the State meet the training needs of people working in the informal sector.

By taking a sector-based and regional approach to labour market observation, and by taking into account the characteristics of the informal economy, it is possible to gain an understanding of the current situation and to establish indicators to monitor its evolution. It is also possible to determine the true nature of labour market needs and to identify those that must be met first when developing program offerings.

2.2 Determination of training needs

Determining training needs is the basis for developing any vocational and technical training system. These needs must be accurately defined and quantified. In simpler terms, the goal is to identify all the trades and occupations practised in the country that require vocational or technical training and to define the main competencies so that they can be grouped together or, alternately, differentiated, with a view to developing programs of study. It is also a question of assessing quantitative work force needs for each trade or occupation in order to achieve a certain balance between supply and demand.

For countries with an occupational classification system, the best way to establish training needs is to determine the number of corresponding jobs and their distribution among the different sectors of economic activity. If existing studies are not helpful, the ministry responsible for the vocational and technical training system must conduct planning studies such as the training sector profiles described above.

In countries without occupational classifications or sector-based studies, other sources of information can be used to determine training needs. This topic will be dealt with later on.

Finally, the characteristics of training needs must be determined: are they well-documented needs for which training already exists, or are they new, recurring or one-time needs?

2.2.1 Occupational classification

An occupational classification[3] is an extensive inventory of all the occupations practised in a given country. Recognized at the national level, the classification establishes standards for defining occupations, thereby making comparisons possible. To be useful in determining training needs, the classification must group occupations together by category or type and by level of competence with respect to their complexity, and indicate the level of education required to practise them. Its use by all ministries and agencies, at census time for example, makes it possible to gather and analyze data on the number and evolution of jobs in each trade or occupation and to relate these jobs to the structure of economic activity in the country itself and in neighbouring countries.

2.2.2 Assessment of quantitative needs and determination of their geographic distribution

If there is no occupational or industrial classification, other sources of information can help assess quantitative labour needs, at least in general terms. The following sections will address a few of these sources:

- sectoral ministries
- sector committees, chambers of commerce, professional associations and other organizations
- business surveys

Sectoral ministries

In most countries, the different sectoral ministries regularly analyze the evolution of economic activity in their sector (e.g. agriculture, tourism, health). These data on the businesses and their production activities should include information about employment and labour.

Also, in some countries, several sectoral ministries are responsible for work force training in their field of expertise and have thus acquired in-depth knowledge of its importance and characteristics. They can therefore contribute to analyzing employment growth and determining personnel replacement needs. These data can often be very useful when economic sectors and training sectors are closely linked, as is often the case in health or tourism, for example.

The fact remains that these ministries have considerable knowledge of their sector, its main players and its projected development. They know what is going on and they have an overview of the situation. They can also provide analyses and formulate extremely useful opinions on training and work force qualification needs.

Sector committees, chambers of commerce, professional associations and other organizations

Often referred to as parity committees, sector committees are generally composed of representatives of employers and workers in a given sector of economic activity, and their mission is usually to define training or work force development needs. Not only are their members representatives of the sector, they are intimately familiar with it. Consequently, they can contribute considerable expertise to the analysis of initial voca-

[3] See Canada's *National Occupational Classification* at www.hrdc-drhc.gc.ca/cnp.

tional and technical training needs in their sector.

The main function of other organizations, such as chambers of commerce and professional associations, is to promote their sector on the basis of their knowledge of its needs and of an analysis of potential development. More often than not, these organizations closely monitor the evolution of activities in their sector, which allows them to identify possible changes. They are therefore aware of work force needs and trends in work force competencies.

Business surveys

In order to obtain missing information or to validate a hypothesis about work force needs for a given trade or occupation, it is often useful to survey businesses representative of the region or sector in question.

Indeed, work force needs cannot be determined without the active participation of businesses. In the final analysis, they are the ones who have the most accurate information about work force qualifications and about training development priorities. Surveying businesses can often provide essential and otherwise unobtainable information to help establish orientations.

There are many ways of surveying businesses. For example, descriptive surveys can be conducted among samples representative of businesses in a given sector. These surveys can focus on employers or the work force, depending on the type of information sought.

Brief surveys to determine employment characteristics in a given region can also be conducted by distributing carefully worded questionnaires to a representative sample in order to gather the most significant data.

In general, it is important to follow up with businesses or individuals who have not returned questionnaires in order to increase the validity of the survey. In some cases, it is necessary to conduct interviews, especially if the respondents do not have the time or skills required to fill out a questionnaire.

Finally, surveys can provide, at a relatively affordable cost, information about work force needs for a new or rapidly changing occupation that conventional sources of information cannot.

Follow-up and updating of data

The determination of training needs is an ongoing process whose results must be constantly re-evaluated. The quality and usefulness of the process therefore depend on data that is updated on a regular basis.

Employment observatories and strategic sector watches are also means of monitoring employment trends and obtaining current data. Larger quantities of up-to-date data improve the quality of diagnoses and the capacity for anticipation and intervention. By its very nature, work force planning requires a considerable capacity for anticipation. To be reliable, it must be based on effective tools and techniques. Nevertheless, its results must always be considered with caution, since they involve economic projections. The historical basis used and hypotheses about a multitude of variables can only establish targets that must be constantly re-evaluated.

2.2.3 Training–employment correlation

As mentioned earlier, vocational and technical training must meet both personal and business development needs. Achieving this delicate balance between labour market

needs and personal expectations will always be an important and sensitive issue for both players and users. To support the economic development of a country, however, vocational and technical training must be adapted to the needs expressed. This objective can undoubtedly be attained without undue limitation of personal freedom and choice. The consistency between the number of individuals to be trained and labour market needs can be evaluated in many different ways, with more or less accurate results depending on the level of development of labour market observation mechanisms. First, program offerings must be planned in such a way as to satisfy the most urgent and obvious needs, that is, those generally attributable to economic development or slowdown (implementation of structuring activities, land reforms and support for industrialization or industrial reconversion policies). When the basis of the vocational and technical training system is in place and the most urgent needs have been met, increasingly precise planning tools may be designed to identify new needs and establish development priorities. These activities must be carried out in close collaboration with the different partners of the ministry responsible for vocational and technical training, that is, the sectoral ministries, labour market representatives, employer and employee associations, and representatives of the informal sector, if applicable.

At this stage of the process, the sectoral data needed to determine work force needs by trade or occupation are compared with data on enrollments. This comparison will make it possible to evaluate the program offerings on a quantitative level. In order to provide adequate support for economic activity and ensure favourable conditions for graduates entering the labour market, there must be a certain balance between the number of individuals trained to practise a given trade or occupation and quantitative work force needs. This is the basis for training-employment correlation.

Training-employment correlation is therefore essentially a matter of establishing the required or targeted number of enrollments for each vocational or technical training program. To do so, it is first necessary to establish connections between programs of study and occupations or groups of occupations, and between targeted and actual enrollments by training sector and by program of study.[4] A basic interface must therefore be created to relate the various trades and occupations in the different training sectors and the programs of study being taught. This interface will consist of a table of correspondence between existing trades and occupations in all sectors combined and the related programs of study. At first glance, it may seem like an easy task, but in many cases, it is more complex than it appears. For example, it is easy enough to establish a connection between the occupation of nurse and the specialized program of study leading to that occupation. It is more difficult, however, to establish a formal connection between the occupation of computer salesperson and the related training, since there are probably several programs of study that could lead to this occupation. Programs leading to more than one occupation

[4] From this point on, information must be gathered for each training sector, as defined in Part 3 of this series entitled *Program Development*.

should be weighted on the basis of a hypothetical distribution of graduates in the different occupations.

Once the necessary interface has been created, data on work force needs can be compared with data on program offerings to determine whether there is a balance, a shortage or a surplus.[5]

The results obtained from the training-employment correlation model are used first and foremost to plan how to develop or consolidate the education system. Once targeted enrollments are compared with actual enrollments in the programs of study, a shortage or a surplus of students can quickly be determined in terms of orders of magnitude and trends, not in terms of specific numbers, as these would probably have to be revised in the very short term. Overall, in a system that has archieved a certain stability, most programs of study should be in a state of balance, so that available efforts and resources can be put toward more difficult situations.

2.2.4 Nature, complexity and recurrence of training needs

Once training needs have been determined and estimated quantitatively, their nature, complexity and recurrence must be examined. Although more qualitative, this analysis makes it possible to determine the type of training best suited to the needs identified.

In fact, it is important to examine more closely the characteristics of the training needs expressed before making a decision concerning the type of training to offer. The appropriate response to a specific training need is not always the development of a new program of study. It must first be determined whether the need expressed actually corresponds to a recognized trade or occupation or to a few new tasks in a trade or occupation for which a program of study already exists. It is also important to gather sufficient information to ensure that the need expressed corresponds to a specialized occupation that is complex enough to warrant vocational or technical training. For example, conventional programs of study do not generally need to be developed for semiskilled trades. These trades are usually learned on the job.

In cases where highly specialized training is required and where practitioners must first master a basic trade, the response should be adapted to this basic characteristic, especially as regards the selection of candidates most likely to benefit from the training. Finally, before a new program of study is developed, it is necessary to verify not only whether there is sufficiently large demand for it, but whether this demand is likely to recur year after year. The appropriate response to a one-time need created by a work force adjustment, for example, or by the implementation of a new technology in a specific socioeconomic sector, will be very different.

The nature, complexity and recurrence of training needs are factors that affect how to best meet the training needs identified in planning studies or by partners of the ministry or agency responsible for vocational and technical training.

The development and implementation of a vocational or technical training program

[5] For further information on training-employment correlation, see Appendix 1.

should be considered only if it has been clearly demonstrated that the training need corresponds to a recognized trade or occupation for which there is no existing program of study. The trade or occupation should also be sufficiently complex to justify a vocational or technical training program and the quantitative needs must be recurrent and sufficient to justify the implementation of a permanent program in at least one educational institution.

In all other cases, alternative solutions should be considered, such as on-the-job training for semiskilled trades, continuing training programs to ensure the professional development of workers who need to develop new competencies in order to practise a given trade or occupation, or local programs in the case of one-time needs.

2.3 Development priorities

Once quantitative work force needs (as well as certain qualitative needs) have been determined, an order of priority must be established for the development of vocational and technical training programs. The conclusions of the different planning studies, particularly the sector profiles and training-employment correlation analyses, should highlight the discrepancies between training needs and program offerings, at both the quantitative and the qualitative level. Possible solutions to bridge these differences can therefore involve the development of new programs of study or the revision or even withdrawal of existing programs if the problems identified are qualitative in nature. Of course, the differences observed between training needs and program offerings can also be quantitative. The solution would then be to reduce or increase program offerings (map of options). Depending on the extent of the differences and their effects on the development of the sector and available resources, the proposed development projects should include priorities and be validated by the individuals or organizations that best represent the sector.

2.3.1 Establishment of priorities

All of this information about the sector will make it possible to determine consistent, realistic development priorities, taking into account both training needs and available resources. Organizing program development activities in order of priority will result in the development of an action plan. Since it is impossible—and inappropriate—to do everything at once or in a single year, system managers, in consultation with the political authorities responsible, should develop a medium- or long-term action plan. As the various sectoral planning studies reveal the qualitative and quantitative differences between training needs and program offerings, consultations with representatives of the communities involved and the validation of hypotheses will make it possible to determine the urgency of developing programs based on a number of criteria.

These criteria can be based on:

- national socioeconomic development priorities
- regional priorities
- available human and financial resources
- existing or potential partnerships
- demographic data
- training-employment correlation
- consolidation of the existing network of educational institutions

2.3.2 Relationships between social and economic development

An action plan can be developed in consultation with different partners such as national training and education councils whose mission is to provide opinions on vocational and technical training issues; industry committees whose duties include providing opinions on priority work force needs in their sector; or national or regional issue tables on vocational and technical training. In all cases, the aim of the consultation is to determine which needs are most urgent, taking into account as much as possible the concerns of the social and economic development partners.

The action plan resulting from this process will serve as a springboard for the development or revision of programs of study as described in Part 3 of this series, *Program Development*. A long-term action plan can and should be revised regularly in the light of any new data. It is a guide and planning tool for the different partners in the reform of the vocational and technical training system.

SUMMARY

The central management of training begins with an analysis of the labour market. In order to ensure the greatest possible consistency between training and employment, the agency responsible for developing program offerings must be aware of the labour market situation throughout the country and in the different regions. More specifically, it must be familiar with the structure and evolution of the demand for competencies in each training sector.

Two approaches can be used to observe the labour market and obtain accurate information about its structure and evolution: the sector-based approach and the regional approach.

Needs analyses are done on the basis of the types and categories of jobs surveyed in the different socioeconomic environments and must include both quantitative and qualitative information: Does training already exist for these trades and occupations, or are they new, recurring or one-time needs?

Finally, once work force needs have been determined at both the quantitative and the qualitative level, and program offerings have been compared with training needs, training development projects must be designed and an order of priority based on needs and constraints must be established, in collaboration with the interested partners. This planning approach for the development of a vocational and technical training system should take the form of a medium- or long-term action plan.

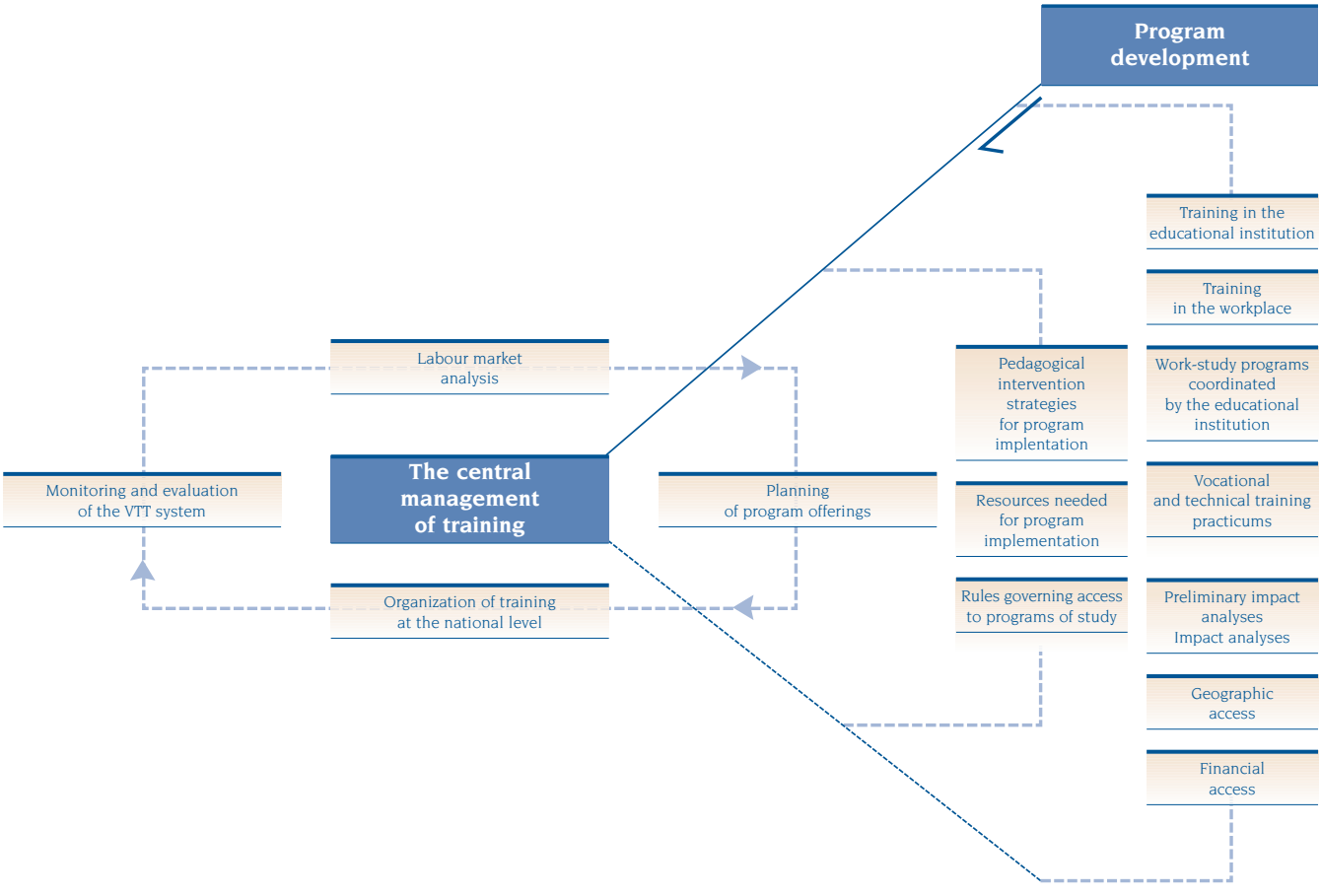
3 Planning of program offerings

The planning of program offerings is contingent on the existence of relevant programs of study. Consequently, this step can be addressed only once the program development process has been completed or is almost complete. In fact, only once the programs of study have been established can central management plan program offerings.

Planning program offerings consists in determining the most appropriate pedagogical intervention strategies for each program of study and identifying the resources needed to adequately teach the program. The programs of study must also be accessible to those who are interested in them and offered in an appropriate and efficient manner in the territory in question. The process therefore consists of three major elements:

- pedagogical intervention strategies for program implementation
- the resources needed for program implementation
- the rules governing access to programs of study

Figure 3 Planning of program offerings



3.1 Pedagogical intervention strategies for program implementation

Implementing a program of study can sometimes be very expensive. In such a case, choices must be made concerning means of offering quality training given the available resources. Different pedagogical intervention strategies are then considered in order to determine which one will be the most cost effective. The implications can vary considerably depending on whether the training is offered entirely in an educational institution, whether it involves practicums in the workplace or whether it is organized according to a work-study approach. In the latter two cases, the hypotheses analyzed will focus on the division of responsibility between the educational institution and the business. For example, in order to reduce implementation costs, it would be possible to organize practicums in the workplace for the development of certain competencies, or to delegate even more responsibility to the business by working out a work-study arrangement coordinated by the educational institution.

In short, the choice of pedagogical intervention strategies or forms of organization has a direct impact on investments in human, material and financial resources and capital costs.

A number of factors can influence the choice of pedagogical intervention strategy for program implementation. The most important ones are:

- costs related to possible learning situations, depending on the program to be implemented
- the government's political will to establish partnerships with industry, including reaching agreements on the sharing of responsibilities
- the consideration of other objectives, such as student retention, academic success and integration into the labour market

There are four major training approaches:

- training in the educational institution
- training in the workplace
- work-study programs coordinated by the educational institution
- practicums in the workplace

3.1.1 Training in the educational institution

Vocational and technical training can be offered entirely in an educational institution, which must then reproduce the production methods used in industry as closely as possible. According to this approach, all learning activities, practical and theoretical, take place within the educational institution, which must have the infrastructure and equipment needed to provide training; if not, they must have access to the necessary infrastructure and equipment provided by a partner. In some cases, agreements can be reached between different educational institutions to share the necessary infrastructure and equipment.

The main challenges associated with this approach entail reproducing conditions in the workplace and ensuring the maintenance and upgrading of equipment.

3.1.2 Training in the workplace

Workplace training can help reduce the cost of the educational institution's physical infrastructure. Since training and the evaluation of learning conflict with productivity requirements, however, there are few cases in which all the training activities in a program of study take place in the workplace.

The possibility should be explored, however, when the organization of training requires so many resources that the situation in the workplace cannot be realistically reproduced in an educational institution. In some sectors, however, particularly those dominated by small businesses, it can be difficult to find enough employers with the material and technical resources needed to fulfill the requirements of a program of study based on the development of competencies.

Finally, more often than not, training in the informal sector is provided in the workplace, in an approach resembling apprenticeship. One of the challenges in developing vocational and technical training programs is to establish gateways between these learning approaches and the content of official programs of study.

3.1.3 Work-study programs coordinated by the educational institution

The work-study approach is based on the sharing of training activities between an educational institution and a business. Consequently, it requires close collaboration between the two partners. Coherent in structure, this approach requires that each of the partners be familiar with the learning acquired in the other establishment and that they take that learning into account in designing their own activities. In this approach, the main responsibility for validating all of the learning acquired lies with the educational institution.

3.1.4 Vocational and technical training practicums

Even if it does not take a work-study approach, each program of study usually involves one or more practicums in the workplace. These practicums can be divided into four major categories, depending on their objectives:

- observation, awareness, immersion
- training
- application
- integration into the workplace

Practicums that focus on observation, awareness or immersion introduce learners to the workplace in the sector of activity in which they will practise their trade or occupation. Such practicums may consist of visits to businesses or short stays in the workplace, allowing students to learn about the workplace, its organization and its methods. These short-term practicums usually take place at the beginning of the training period.

Practicums that focus on training consist in carrying out some of the learning activities included in the program of study in the workplace, under the direct supervision of teachers from the educational institution. These practicums are essential when facilities or equipment are not available or cannot be simulated in the educational institution (for some occupations in the mining sector, for example) or when it is impossible to reproduce the conditions of an occupation in which services are offered to a specific clientele (most health care programs, for example). Other training approaches require greater involvement on the part of businesses. For example, according to Germany's Dual system of apprenticeship, educational institutions are set up alongside companies, which are responsible for the greater part of initial training based on their own tasks and working conditions.

Practicums that focus on application allow learners to practise the competencies

acquired in the educational institution in a real work setting. These practicums are not aimed at helping the students to acquire new competencies, but to transfer the competencies developed in the educational institution and to improve their performance. Of variable duration, these practicums generally take place when training is relatively advanced.

Finally, the aim of ***practicums that focus on integration into the workplace*** is to give learners the opportunity to actually practise their trade or occupation and to integrate the learning acquired during training. Consequently, these practicums take place once training is complete.

3.2 Resources needed for program implementation

The aim of planning program implementation resources is to determine the conditions for implementing a program developed according to the competency-based approach and to establish a funding method that will allow the educational institution to offer the program year after year. If it is to be effective, this process must be an integral part of the competency-based approach to program development. Certain verifications must be done during the development process, followed by a detailed impact analysis, before a program can be implemented.

3.2.1 Preliminary impact analyses

The preliminary impact analysis is based on the training approach selected for a given program. The approach includes defining learning content and the order of objectives, as well as the pedagogical intervention strategies mentioned earlier. It is therefore necessary to wait until the proposed training plan[6] has been defined by the team responsible for program design before proceeding with the analysis. A preliminary impact analysis should always be done before the program development process is completed in order to confirm the choice of training approach and the human, physical and material resources necessary for program implementation. In fact, conducting the impact analysis during the development process ensures the feasibility of the pedagogical choices and eliminates the need to start over if the necessary resources are unavailable. It is also strategically important to carry out the analysis before the proposed training plan is validated by representatives of the labour market and the education community. The preliminary impact analysis makes it possible to evaluate the feasibility of the training approach suggested by the program design team and to propose it during the validation stage if the level of resources required is deemed reasonable and the resources are indeed available. If these conditions are met, the program development process can continue. This method makes it possible, on the one hand, to avoid creating unrealistic expectations among the partners and, on the other, to make use of the validation stage to confirm the new approach, if applicable.

If the preliminary impact analysis, however, reveals that the training approach proposed by the program design team requires a level of resources incompatible with the State's means, the development

[6] See Part 3 of this series entitled *Program Development*.

process must be suspended and all efforts must be directed toward finding a new training approach that requires fewer resources yet produces the desired results. The collaboration of businesses in the sector could then become a key factor in the process. Technological solutions, such as the simulation of certain operations requiring excessively expensive equipment, could also be considered. Distance education might also be an option for part of the program, or even the use of mobile equipment when enrollments are dispersed over a large territory, as is the case in island countries, for example.

In short, it is absolutely necessary to find a training approach to ensure that the program of study is relevant, that is, that it prepares learners to practise the targeted trade or occupation, that it is pedagogically coherent, and that it favours the progression of learning and academic success. It must also, however, be feasible or applicable, that is, its implementation and delivery must require an affordable level of resources for both the State and the students; otherwise, the proposed training plan is doomed to failure from the outset.

To be accurate and thorough, a preliminary impact analysis of program offerings must assess not only the cost of implementing and teaching a typical program, but also take into account recurrent quantitative work force needs in the targeted trade or occupation, throughout the country. The unit cost of implementing a program should then be multiplied by the number of points of service that might be needed to meet the country's work force needs. The system managers must base their evaluation and decisions on this overall level of resources.

3.2.2 Impact analyses

The aim of an impact analysis is to determine the resources needed to implement a program of study. These analyses are carried out in accordance with the training approach selected (e.g. work-study, apprenticeship, training in the educational institution). They are used to assess the cost of implementing and teaching a program of study. When training is dispensed in an educational institution, impact analyses are used to determine:

- human resources assigned to teaching
- the necessary support resources (pedagogical, administrative, technical)
- the necessary facilities (e.g. traditional classrooms, workshops, laboratories, stores, storage facilities)
- basic equipment and equipment using new technologies
- material resources, including light machinery and raw materials

In the competency-based approach, implementing a program of study requires using a teaching strategy that simulates the practice of the trade as accurately as possible.[7] Indeed, the competencies required to practise a trade or occupation effectively and autonomously can only be acquired through practical learning activities that integrate the relevant knowledge, skills and attitudes. These learning activities must respect the context in which the different tasks of the trade are carried out and target a level of performance consistent with the requirements for entry into the labour market.

The competency-based approach has a considerable impact on the training system, since it requires educational institutions

[7] See Part 4 of this series entitled *Program Implementation at the Local Level*.

to have all the physical and material resources necessary for each individual to carry out all the learning activities contained in the program on equipment generally used in the industry, for as long as it takes to achieve the desired degree of proficiency. It is no longer enough that the learner do a few basic activities on educational or obsolete equipment. Nor is it possible any longer to limit teaching to demonstrations by the teacher because there is not enough equipment available or, worse still, to theory presentations.

To determine the equipment and facilities needed to teach a program of study, it is necessary to do a detailed analysis of each competency involved, establish one or more learning scenarios and anticipate the learning activities to be carried out by the learners. This prospective exercise can only be carried out by experienced teaching specialists who are perfectly familiar with the new program and the trade or occupation in question. The people who developed the program are usually in the best position to fulfill this task. A detailed analysis of the program's objectives will make it possible to propose training consistent with its requirements (facilities, equipment and learning materials) but especially to accurately estimate implementation costs as well as recurring operating or training costs.

If the programs are developed by the ministry responsible for vocational and technical training or by a designated agency with a view to standardized implementation throughout the territory, the impact analysis phase may be structured more formally and perhaps even be the subject of an implementation or instructional and material organization guide. In such a case, the impact analysis goes beyond the initial administrative objective of estimating implementation costs and planning financial resources, and becomes a tool to support educational institutions in the implementation of the new program.

Finally, depending on the training approach used, impact analyses should make it possible, if necessary, to determine and take into consideration the nature and extent of the contribution of businesses to the proposed training plan and the resulting costs (e.g. follow-up, support and supervision, movement of enrollments and personnel, liability insurance).

3.3 Rules governing access to programs of study

The training-employment correlation objectives targeted by any vocational and technical training system should be compatible with objectives related to access.

From a strictly economic standpoint, the vocational and technical training system could implement a network of educational institutions and programs of study modelled on the socioeconomic structure of the country. In this context, program offerings would be closely related, geographically as well as in terms of training capabilities, to the distribution and size of businesses. Large cities would have more resources than rural areas, since that is where industry and services are usually located. In some sectors, for example tourism, specialized training would be offered only in regions where the concentration of businesses justified it (e.g. seaside resorts). Similarly, agricultural training would be offered only in predominantly rural areas.

These considerations are pertinent in a demand-driven system, in which program offerings are supposed to be an appropriate and effective response to work force needs.

In a society in which vocational and technical training is considered an integral part of the education system, however, rules governing access should be established in such a way as to give all citizens an equal opportunity to acquire training that will allow them to enter the labour market and find a job that corresponds to their aptitudes and interests.

Access to training can be considered from a geographic or financial point of view. The first refers to the structural conditions for access, the second to the financial resources of those interested in acquiring training.

For economic, geographical and demographic reasons, not all vocational and technical training programs can be offered in every region of a country, which means that some people will have to move in order to acquire certain types of training. Measures can be considered to facilitate the situation and promote access (e.g. free education, State bursaries, loans, grants from companies or regional authorities, internships).

3.3.1 Geographic access

In planning program offerings, those responsible for the central management of the vocational and technical training system must take into consideration the magnitude of work force needs in each trade or occupation, their distribution throughout the territory and means of organizing training activities. Depending on the magnitude and nature of the needs, and the available financial resources, there may be an advantage to creating local, regional or even national educational institutions.

In an effort to democratize education, vocational and technical training should be made accessible to as many people as possible. To this end, educational institutions must be established as close to potential candidates as possible. The establishment of educational institutions offering vocational and technical training in as many locations as possible is a valid objective. Not surprisingly, however, a number of constraints will limit the development of the network, the first one being the number of people requesting training in a given territory. In addition, the nature of work force needs in the territory and, of course, the availability of resources, will also have to be taken into consideration.

Map of options

Work force needs analyses performed as part of planning studies, including sector profiles and other quantitative studies, generally reveal enormous quantitative differences between the different trades and occupations. While some occupations (e.g. secretary) are practised in almost every sector of economic activity and in every business, others are practised by a limited number of workers and, consequently, have limited turnover needs. Yet the availability of a skilled work force in these occupations is often a strategic factor for business development, especially in leading sectors.

These same studies also show that some occupations are concentrated in certain geographical areas. Consider occupations related to fishing or shipping, for example, or highly specialized trades practised in a limited number of businesses, all of them in the same city or region, as is often the case in the high tech industry.

These quantitative considerations reveal the need to achieve a certain balance between quantitative work force needs and the capacity of the vocational and technical training system to train specialized workers, which brings us back to the concept of training-employment correlation, discussed in the previous section.

If such a balance is not reached, surpluses of qualified workers are likely to occur in some trades or in some regions of the country, and shortages in other trades, regions or sectors of economic activity. The sound management of program offerings is therefore aimed at optimizing new graduates' chances of entering the labour market and supporting businesses in their development by ensuring the availability of qualified workers in every trade for which there is a need.

Practically speaking, the best way of achieving the desired balance is to establish a map of options, that is, to manage authorizations to teach programs of study at the national level, and to grant them to the different educational institutions.

Thus, programs of study leading to the practice of the most common trades will be offered in every region or, ultimately, in almost every educational institution, while others will be offered only in a limited number of selected institutions depending on the geographic concentration of work force needs or simply with a view to offering a minimum number of programs in every region of the country. Finally, other programs of study may be offered in a single educational institution. Institutions with regional or national exclusivity must, however, ensure that all eligible candidates are offered equal access, regardless of where they live.

The distribution of authorizations granted to public and private educational institutions is referred to as the *map of options*.

The ministry responsible for vocational and technical training should be in charge of distributing authorizations to teach certain programs in collaboration with its partners in regional development, including:

- educational institutions offering vocational and technical training
- the ministry responsible for employment development
- the ministries and agencies responsible for the administration of the territory
- the sectoral ministries responsible for training
- business associations
- chambers of commerce and employer associations
- unions

The objective of such cooperation is to harmonize the government's major development objectives with regional imperatives for socioeconomic development.

3.3.2 Financial access

Despite careful attempts to offer training in every region, access to vocational and technical training is not guaranteed. In fact, in many cases, applicants—or their families—do not have the resources necessary to enroll in and complete the program of their choice, especially if the program is offered outside their community.

A number of support measures can be adapted to promote access to vocational and technical training. Limiting tuition fees, or providing free education for everyone, are undoubtedly the most effective measures of all.

Loans and bursaries are also a form of financial assistance intended to facilitate access to training, since they help cover a portion of education-related living expenses and, if applicable, tuition fees.

Loans and bursaries can take many forms. In some countries, the State, organizations or businesses award bursaries to students on the basis of merit, taking into account their academic results to date or results obtained in competitions to obtain access to targeted programs. These bursaries usually do not take into account the financial situation of the student or his or her family. In other countries, the State, organizations or businesses award bursaries to students who do not have the means to attend an educational institution, also on the basis of merit.

Other forms of student assistance in effect in some countries are based solely on the students' or their families' ability to pay. The basic principle underlying this type of loan and bursary system is that students and, if applicable, their parents or spouse, should assume part of the cost of tuition and living expenses in proportion to their income. The amount of government assistance to be provided is determined on the basis of expenses normally incurred in the pursuit of studies and the expected contribution of the student and his or her family.

The establishment and funding of student residences are also means of facilitating access to training, especially when part of the cost is assumed by the State.

Finally, a loan and bursary system can also favour recruitment in strategic sectors with serious shortages of qualified workers. Thus, some businesses award bursaries on the condition that the students agree to work for the business for a set period of time after graduation.

SUMMARY

Planning program offerings consists in determining the most appropriate pedagogical intervention strategies for each program of study and identifying the resources needed to adequately teach the program. The programs of study must also be accessible to those who are interested in them and offered in an appropriate and efficient manner in the territory in question. The process therefore involves three major elements:

- pedagogical intervention strategies for program implementation
- the resources needed for program implementation
- the rules governing access to programs of study

Determining implementation strategies consists in analyzing different models of instructional organization in order to select the most cost effective one. Whenever possible, the analyses determine how responsibilities can be shared between educational institutions and businesses. The organization of practicums, work-study programs coordinated by educational institutions or workplace training can help reduce the cost of implementing a program of study.

The aim of planning the resources needed for program implementation is to determine the conditions for implementing a program developed according to the competency-based approach and to establish a funding method that will allow the educational institution to offer the program year after year.

Finally, access to training can be considered from a geographic or financial point of view. The first refers to the structural

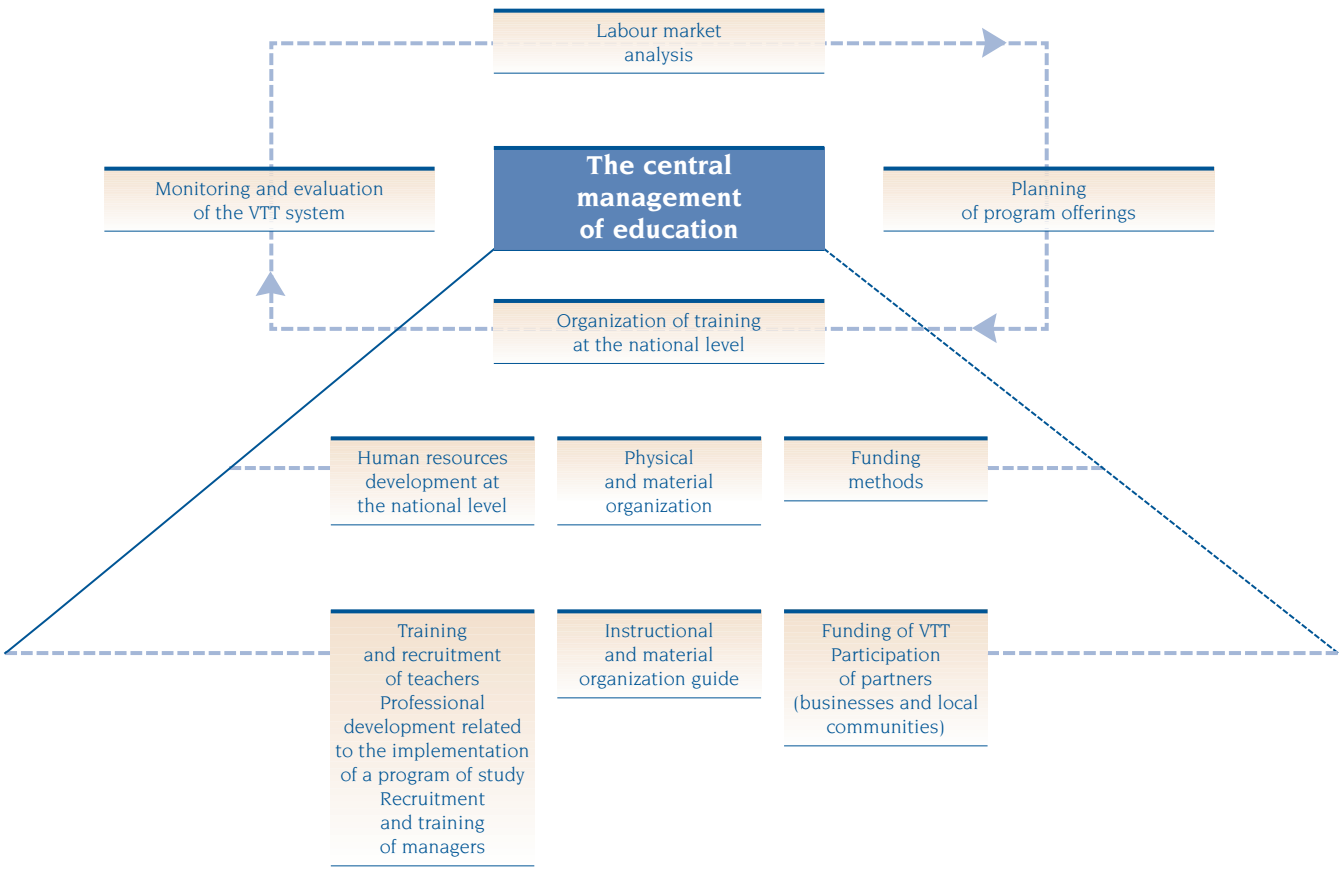
conditions for access to training, that is, the availability of places for a given program and in a student's region, while the second involves the financial resources of those interested in acquiring training and the different forms of assistance that may be granted by the State or private organizations.

4 Organization of training at the national level

Essentially, organizing training at the national level consists in determining the human, physical, material and financial resources needed to establish and maintain an effective training system and in establishing mechanisms for access to these resources by the different educational institutions.

The organization of training at the national level comprises three dimensions: the determination of funding methods, the physical and material organization of training (equipment and facilities) and, finally, the initial training and professional development of human resources.

Figure 4 Organization of training at the national level



4.1 Funding methods

Funding for vocational and technical training activities carried out in public educational institutions is generally provided by the State. In some cases, however, private companies that accept student trainees can bear part of the training costs, while in others students may be called upon to assume part of their own training costs. In a number of countries, it is mainly the ministry of Education or the ministry of Vocational Training that funds initial training, while the ministries or agencies responsible for work force development, companies or adult learners share the cost of continuing training in different proportions.

Funding activities

Funding comprises two complementary aspects:

- capital costs (equipment and facilities), which are amortized over the medium or long term
- operating costs, including equipment replacement expenses, which are recurring and unamortized

In both cases, the nature of the program of study will determine the amount of resources needed. As seen earlier, the *instructional and material organization guide*, or the implementation cost estimate if no guide exists, should specify the resources needed to attain the objectives related to each competency in the program of study. The information in this document is used to set funding parameters adapted to each program or family of programs.

Funding of capital costs related to the establishment of program offerings

As seen earlier, the implementation of a new vocational or technical training program or the revision of an existing program according to the competency-based approach requires facilities and equipment that simulate as closely as possible the conditions in which the trade in question is practised. This generally requires the construction or renovation of facilities (classrooms, laboratories and workshops). Capital costs also include equipment needed for students to carry out all of the learning activities included in the program of study. The list of necessary equipment can usually be found in the instructional and material organization guide or the implementation cost estimate.

Moreover, if the planning studies reveal significant quantitative needs, it may be necessary to build or renovate several educational institutions throughout the territory. Such a project will, of course, require major government investments.

These investments are usually included in medium- or long-term capital plans accompanied by three- or five-year plans submitted to the government authorities by the ministries responsible. A reform of the vocational and technical training system or a major revision of certain programs of study usually results in the implementation of such plans. Sometimes, these investment plans can also arise from the need to increase capacity in order to better meet the needs of businesses or to deal with population growth.

Funding of operating costs

Operating costs essentially comprise three variables:

- the cost of human resources (mainly teachers, but also support and management personnel)

- the cost of replacing perishable materials or material resources[8] (e.g. wood, nails, screws, small tools with a short life span such as bits and saw blades for a cabinet-making program, or food and cleaning products for a cooking program)
- the cost of replacing durable equipment (e.g. furniture, tools and instruments) needed to carry out the learning activities. This equipment has a longer useful life (at least five years), but eventually needs to be replaced once it wears out or becomes obsolete. Funding measures must therefore provide the educational institutions with access to the financial resources necessary to replace this equipment once its useful life has expired. Unless it is regularly updated, equipment that was set up at great cost when a program of study was implemented will age and, one day, will no longer meet industry requirements or will simply cease to function. The quality of training offered will obviously suffer, since the students will no longer be able to acquire the competencies required by the labour market or, at best, will be unable to meet the performance criteria required for entry into the labour market.

Furthermore, accumulated delays in updating equipment will inevitably result in the need for major reinvestment. It is therefore better to provide for funding measures that allow educational institutions to maintain and upgrade their equipment and facilities as the need arises.

4.1.1 Funding of UTT

The funding system for vocational and technical training must allow educational institutions to adequately fulfill the mission entrusted to them by the State, i.e. program implementation at the local level. In order to implement competency-based programs of study, and to train, in each program it is authorized to teach, the number of students necessary to meet the work force needs in the region it serves, the educational institution must have access to significant financial resources that the State is generally able to provide. This does not, of course, preclude the search for complementary sources of funding among regional authorities, private companies or students, although it must be recognized that the main source of funding for a public vocational and technical training system is usually the State.

Establishment of funding methods

Funding for vocational and technical training, like general education, must take into account the number of enrollments and the duration of the programs of study, mainly in order to determine the amount of human resources needed. It must also, however, take into account important differences between the programs in terms of implementation and operating costs.

Indeed, these costs may vary considerably depending on the nature of the equipment and facilities needed. For example, programs in the Administration, Commerce and Computer Technology sector are generally far less costly to implement than programs in the Mechanical Manufacturing sector. Educational institutions must have access to funding adapted to the cost of organizing training for each program of study. Otherwise,

[8] See Part 4 of this series entitled *Program Implementation at the Local Level*.

the more costly programs will be abandoned or limited in their development in favour of those that require less of an infrastructure. Such imbalances could considerably hinder the system's ability to meet work force needs at both the qualitative and the quantitative level.

4.1.2 Participation of partners (businesses and local communities)

Alternative solutions based on the sharing of training costs among the main government players can also be envisaged. In some cases, these solutions might involve using part of the contribution that businesses already make to human resource development (through a payroll tax, for example) or awarding businesses that participate in training activities compensation in the form of tax credits.

A number of other avenues can be explored to involve the different partners in the funding of training. These include:

- implementing work-study programs
- lending or donating equipment to educational institutions
- sharing facilities
- lending specialists or accepting teachers for in-service training
- accepting student trainees (with or without compensatory tax credits)
- contributing to the development of programs of study (e.g. participation in job analyses) and the validation of proposed training plans[9]
- participating in activities to promote vocational and technical training

Determining the most appropriate measures will depend on the country's context and socioeconomic situation.

4.2 Physical and material organization

Practically speaking, educational institutions should generally be responsible for setting up the facilities and acquiring the equipment needed to achieve the objectives of a program of study.[10]

In a management context favouring greater autonomy for educational institutions, this responsibility should be assumed by the administration of the institution, in close collaboration with the local or regional authorities responsible for vocational and technical training, if applicable. Their familiarity with the resources available locally, with the businesses with which they may eventually form partnerships, and with other organizations in their community make them a focal point for program implementation at the local level.

Indeed, consistency of training throughout the territory and conformity with national standards are ensured through programs of study and evaluation guides or instruments developed at the national level, sufficiently detailed organization guides or implementation cost estimates produced to facilitate implementation, and funding methods corresponding to the requirements of each program. The desired quality of training will be guaranteed, on the one hand, by the rigour of the competency-based approach to program development

[9] See Part 3 of this series entitled *Program Development*.
[10] See Part 4 of this series entitled *Program Implementation at the Local Level*.

and, on the other, by the active participation of each educational institution and by each staff member's increased responsibility in the implementation and management of the system.

4.2.1 Instructional and material organization guide

The *instructional and material organization guide* or the *implementation cost estimate* provides a reference model for implementing and providing training. It constitutes the "specifications" for each program of study. The guide or specifications should generally include information about the suggested facilities and the physical and material resources necessary for one or more groups of students to effectively carry out all the learning activities normally required to master the competencies contained in the program of study. Based on this information, an operational analysis specific to each educational institution authorized to offer a program must be done, taking into account the existing facilities and equipment.

This comparative analysis of the suggested reference model and the actual situation will allow each educational institution to determine how much work needs to be done on the facilities and what equipment must be purchased, and to establish implementation costs for the program. Depending on whether the educational institution is offering a new program or a revised version of an existing program, there will be more or less planning to do, and costs may vary from one institution to another. In all cases, however, compliance with the recommendations in the *instructional and material organization guide* will ensure that the administration is in line with the requirements of the program of study, while the ministry will be confident that the educational institutions are capable of meeting the quality requirements established in collaboration with the labour market.

4.3 Human resources development at the national level

The basic conditions for the successful implementation of a program of study are: initial training for teachers that is relevant and adapted to the specific needs of vocational and technical training, the availability of the resources needed to update teachers' technical knowledge, and the consolidation and development of teaching skills, in particular in terms of adapting them to the requirements of the competency-based approach.

Similarly, management personnel must also be familiar with and trained in the requirements and characteristics specific to vocational and technical training, such as managing teams of instructors, establishing partnerships with the community, mastering a competency-based educational approach and evaluating the institution's results.

4.3.1 Training and recruitment of teachers

Teachers are trained and recruited differently in vocational and technical training than they are in general education.

The need to master the competencies specific to a trade significantly changes teachers' profiles and career paths. Since proficiency in trade-related competencies is the main hiring condition, teachers are often recruited from businesses in a related sector. Under these circumstances, it is obvious that the vast majority of recruits will not have had initial training in pedagogy

and didactics at the time of hiring. It is therefore necessary to develop an approach by which this training can be ensured during the first years of teaching. Under these conditions, it is possible to recruit and train qualified teachers who are first and foremost specialists in a particular trade or occupation. Also, the ministry responsible for vocational and technical training should establish partnerships with higher education institutions specialized in teacher training in order to develop and implement programs adapted to their needs and, perhaps, to establish incentives or regulatory measures designed to encourage teachers to undergo such training.

Indeed, it is absolutely essential that vocational and technical training teachers remain in contact with the labour market so that they can update their competencies in accordance with technological advances.

In any event, any regulations respecting the qualification of vocational and technical training teachers[11] should involve educational institutions offering vocational and technical training, businesses, and higher education institutions responsible for teacher training.

4.3.2 Professional development related to the implementation of a program of study

For vocational and technical training teachers, continuing training and professional development are unavoidable. Three major elements must be considered in in-service pedagogical training:

- the appropriation of the program of study, guides and tools made available to teachers in the competency-based approach
- the updating of technical competencies related to the new technologies presented in the new program
- the preparation of instructional materials in accordance with the planned activities and the optimum use of physical and material resources

When new programs of study are being implemented, special attention should be paid to the first two above-mentioned elements.

The appropriation of the program of study

In vocational and technical training, teachers are recruited first and foremost on the basis of their competencies as specialists in a trade or occupation, which they can continue to practise in the labour market. In many cases, recruits choose to keep their jobs in industry and to teach part-time. They generally have little time to devote to continuing education and training activities, but they must nevertheless study the objectives of the program and acquire a few concepts of pedagogy.

To complement higher education programs, which are intended to help learners acquire and update the pedagogical and didactic competencies they need to teach vocational and technical programs and, especially, to support the efforts of part-time staff, tools such as professional development packages can be developed in order to facilitate the rapid appropriation of the program of study.

Professional development packages

In the event of major changes to a pro-

[11] See Part 1 of this series entitled *Government Orientations, Policies and Structures*.

gram of study, basic training should be offered to all VTT teachers. The topics addressed during training might include:

- the program development process (competency-based approach)
- the interpretation of the objectives of a program of study
- the use of specialized documents (teaching guide, evaluation guide, instructional and material organization guide)
- instructional planning
- lesson plans (theory and practical)
- teaching using lesson plans
- the application of the different evaluation methods

The updating of technical competencies

This type of development is aimed at helping teachers update, on a regular basis, their knowledge and competencies with respect to the most recent technological innovations in their field. In some cases, a specific measure should accompany the implementation of programs of study that have undergone major revisions in order to allow teachers to catch up on the new competencies required of students enrolled in the program.

Such a measure may require the financial contribution or expertise of a business, for example, for the implementation of a new, complex and expensive software program. In this case, the business could provide the software and have specialists present it to the teachers concerned.

4.3.3 Recruitment and training of managers

The recruitment and training of managers is a major challenge in vocational and technical training. Given the requirements of the task and the complexity of the environment, very few people have the competencies and qualities required.

The desired management profile includes at least three types of competencies: pedagogical, technological and administrative. In addition, special aptitudes are required, in particular to maintain interpersonal relations, mobilize work teams and establish partnerships with businesses.

Managers of VTT institutions, especially those who work in highly decentralized environments aimed at giving them more autonomy and responsibility, are increasingly required to possess or acquire the competencies demanded of business executives: to strive for effectiveness and efficiency in managing financial resources; to provide leadership and a vision of the future allowing them to plan and organize the development of their institution and to make it an essential partner in the region's socioeconomic development; and to mobilize vast human resources with various competencies around collaborative projects. They must not, however, forget that they are not managing a business subject to the laws of competition and the marketplace, but an educational institution whose primary mission is to educate and contribute to the growth of young people and adults through the development of their aptitudes and potential, with a view to allowing them to take control of their lives, not only on a professional level, but on a personal level as well. These managers must therefore know how to listen, discuss, encourage, mobilize, counsel, provide positive reinforcement and,

if necessary, apply sanctions.

To attract qualified management personnel, a solid management recruitment policy must be established, and the resources and means necessary for their support and professional development must be available throughout their career.

SUMMARY

In terms of central management, the organization of vocational and technical training comprises three dimensions:

- the determination of funding methods
- the physical and material organization of training (equipment and facilities)
- the initial training and professional development of human resources

Any funding system for vocational and technical training should provide educational institutions with the physical, material and financial resources necessary to meet the requirements of the programs of study. Although most of the funding is usually provided by the State, other sources of funding are also possible, for example, through different levels of government (local or regional), businesses and students.

With respect to the physical and material organization of training, those responsible for the central management of training must generally provide educational institutions with instructional and material organization guides or implementation cost estimates, which provide specifications allowing the institution to meet the requirements of the program of study and to comply with the training standards established in partnership with the labour market.

The initial training and professional development of human resources are key factors in the success of a vocational and technical training reform, especially in the competency-based approach. The initial training of teachers, the updating of technical knowledge and the consolidation and development of teaching skills are basic steps in the successful implementation of a program of study.

Similarly, it is also essential that management personnel be familiar with and trained in the requirements and characteristics specific to vocational and technical training, such as managing teams of instructors, establishing partnerships with the community, mastering an instructional management approach based on competencies, and evaluating the educational institution's results.

5 MONITORING AND EVALUATION OF THE VTT SYSTEM

A vocational and technical training system is a dynamic system designed to meet the changing needs of the labour market. It is a complex system, which must fulfill a dual mission: satisfy specialized work force needs for every socioeconomic sector in the country, and contribute to the development of individuals by allowing them to acquire the occupational and personal competencies needed to enter the labour market in the sector and trade of their choice and develop in their chosen field.

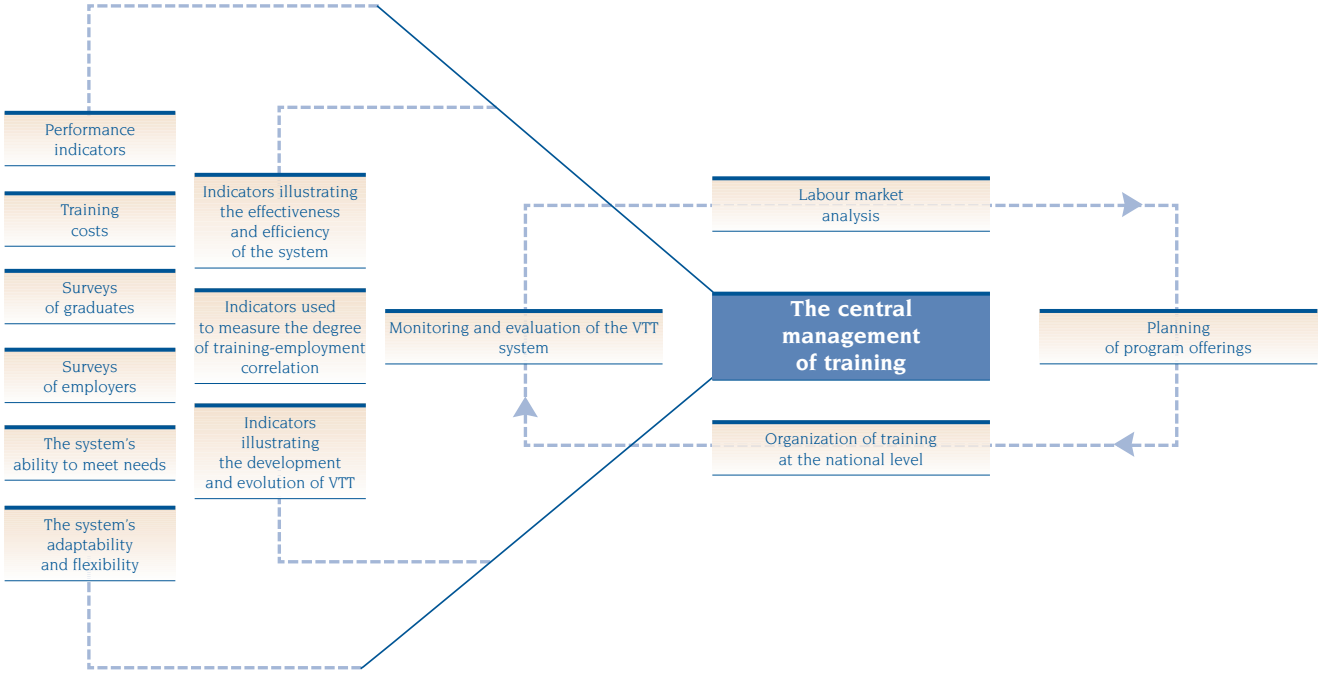
A great number of actors play a direct or indirect role in a vocational and technical training system: students and teachers, businesses and representatives of the labour market, specialists and managers from ministries and educational institutions, to name but a few. Considerable financial resources are allocated to VTT by govern-

ments, businesses and even students, who all have high expectations. Managers must therefore be able to monitor the evolution of the VTT system and measure the results obtained from different points of view if they are to be able to evaluate it objectively and adapt or change certain aspects to bring it in line with its initial objectives.

A good way of achieving this goal is to consider the system's main objectives and to establish a number of indicators that can be used as information and regulatory tools. These indicators can be divided into three categories:

- indicators illustrating the development and evolution of the vocational and technical training system
- indicators used to measure the degree of training-employment correlation
- indicators illustrating the effectiveness and efficiency of the system

Figure 5 Monitoring and evaluation of the VTT system



5.1 Indicators illustrating the development and evolution of the vocational and technical training system

Today, the education systems in most countries are described, analyzed and compared using indicators. Their profitability, effectiveness or performance can only be assessed using appropriate data. Since each indicator allows for comparisons of only a single characteristic, however, a series of indicators is generally required to observe an object from different angles. One indicator taken alone, therefore, has little meaning and becomes useful only when compared with other indicators or with itself in a longitudinal study; it is the successive accumulation of data over time that makes it possible to

see the differences and monitor the evolution of a system. Education indicators make it possible to measure, among other things, the evolution of enrollments, the government's financial contribution to education or access to education and academic success.

The ministry or agency responsible for the development of vocational and technical training should establish its own indicators, particularly with respect to the development and evolution of program offerings. These more specific indicators should make it possible to establish guidelines and orientations for the system.

The indicators specific to vocational and technical training may address, for example, the evolution of enrollments and graduates according to age, gender, training sector or even program of study and region. In general, they also include comparisons between national and regional data and even data from other countries or regions.

They can also be used to measure the system's ability to meet the needs expressed as well as its adaptability and flexibility.

5.1.1 The system's ability to meet needs

All educational institutions offering vocational and technical training must be an integral part of their community. To this end, managers must play an active role in their socioeconomic community, and give players inside and outside the institution considerable scope in managing and evaluating the educational institution.

This evaluation is based on the services offered by the educational institution to students and the community in general and may address, for example:

- the percentage of students of a given generation who enroll in VTT
- the diversity and quality of services
- the composition of the teaching staff
- the diversity of professional development activities for teachers
- the rate of participation in these activities
- the utilization rate of the training system
- the rate of enrollment in VTT, particularly among young people continuing their education without interruption

5.1.2 The system's adaptability and flexibility

Partnerships with the labour market and the socioeconomic community, as well as the resources devoted to updating teachers' knowledge and maintaining equipment, must be evaluated. Such evaluation might address, for example:

- relationships or contacts with businesses and other partners
- the diversity of financial contributions needed to replace and maintain equipment
- the renovation and maintenance of facilities
- the continuing training of workers in the business
- the contribution to the development of entrepreneurship
- the development of services to businesses
- structured practicums in the workplace or work-study programs

All of these data may be used to assess the quality of the vocational and technical training system and of each educational institution. The indicators used to measure these variables are, however, more difficult to establish, and especially to standardize at the national level. The effectiveness of an educational institution will be evaluated at the local level, taking these variables

into account, as part of the process of monitoring and annually updating the educational institution's project.[12]

5.2 Indicators used to measure the degree of training–employment correlation

Since the vocational and technical training system is designed specifically to meet labour market needs, it is understandable that those responsible for the system will want to measure the degree of training-employment correlation.

Training-employment correlation has both qualitative and quantitative aspects. The qualitative aspect refers to the relevance of a program of study, that is, the correlation between the competencies required to practise the trade or occupation and the objectives of the program of study, while the quantitative aspect concerns the balance to be maintained between program offerings and work force needs by trade or occupation for each region or the entire country. Quantitative imbalances between training and employment will result in shortages or surpluses of specialized workers.

The search for better training-employment correlation is therefore one of the major objectives of system managers, and the establishment of indicators allowing them to measure the level of training-employment correlation is essential.

It goes without saying, however, that it is more difficult to establish indicators to measure non-quantifiable, or qualitative, data, such as the relevance of programs of study. This type of activity requires more descriptive and analytical studies, which will be discussed later on in the section on employer surveys.

There are two principal ways of ensuring an appropriate response to quantitative work force needs. The first involves determining the ideal or optimum number of enrollments in each program of study using a planning tool and taking academic success and student retention into account.[13] The second involves using the rate of integration of graduates into the labour market as an indicator of the degree of training-employment correlation. This information can be obtained by surveying graduates a few months after they finish their studies.

The two approaches are complementary. Indeed, any education system must, on the one hand, have a means of predicting needs in order to plan its program offerings and, on the other, have a relatively accurate idea of the rate of integration of graduates from each program of study into the labour market in order to be able to adjust program offerings as needed. This feedback can result in various measures such as quotas for certain programs of study, the increase or reduction of program offerings (see *Map of options*, section 3.3.1) or campaigns to promote programs of study with the best job prospects.

5.2.1 Surveys of graduates

These surveys are intended to describe and make known the situation of vocational and technical training graduates six months to a year after they finish their studies. They are a reliable, accurate and up-to-date

[12] See Part 4 of this series entitled *Program Implementation at the Local Level*.
[13] See Appendix 1.

source of first-hand information about the entry of new graduates into the labour market, by program of study or training sector for each region and for the entire country. They must be conducted systematically every year in order to make it possible to monitor the evolution of the situation and make the necessary adjustments to the system.

To be reliable and informative, these quantitative data must, in principle, be gathered from the entire population in question and not from a sample group, especially if there are a limited number of graduates. Indeed, results for programs of study with few graduates must be interpreted with caution, even if the survey is administered to the entire population.

The data gathered may address, for example:

- the rate of entry into the labour market
- the proportion of jobs related to the graduates' training
- the proportion of graduates pursuing further education
- the unemployment rate
- the average rate of pay

While all these quantitative data help describe the condition of the system, they are inadequate when it comes to explaining its operation. They can, however, be used to analyze, evaluate and compare programs and training sectors if they are observed long enough. Nevertheless, they must be interpreted with caution. To help explain a problem or, better yet, establish a corrective measure, these data must be compared with other data, and the possible causes of problems identified must be analyzed and validated by experts and partners. In short, indicators alone are not enough to diagnose a problem, let alone determine a solution; all they do is raise the alarm by revealing signs of a flaw in the system.

In the case of surveys, for example, low labour market integration rates, year after year, among graduates of a given program might perhaps be a sign of too many enrollments with respect to labour market needs for the given trade, in which case aggressive action should be taken to correct the imbalance. A sudden decrease in the rate of integration into the labour market could be explained by a slowdown affecting a particular sector or perhaps every sector of the economy. Such a situation might be temporary and, despite graduates' difficulty entering the labour market, might not necessitate any fundamental change in program offerings, at least not before the long-term consequences of the economic fluctuations are understood. Finally, a constant decrease in the rate of integration into the labour market for a given program of study could be explained by employers' growing dissatisfaction with the training offered. Indeed, if employers observe that the VTT graduates they hire do not have the desired competencies, they will find a way of recruiting satisfactory employees elsewhere, or will take the necessary measures to train their work force themselves, more or less satisfactorily. Unfortunately, a lack of adequate training to meet urgent labour market needs could hinder the economic development of businesses in the sector in question.

Should the indicators reveal a qualitative imbalance between training and employment, other information can be used to identify or confirm the cause. These indicators, however, are generally more descriptive than quantitative, and employers themselves

can provide information about their level of satisfaction.

5.2.2 Surveys of employers

Less frequently, perhaps every two or three years, employers who have hired vocational and technical training graduates can be asked to assess the relevance and quality of the latter's training. These surveys can be administered to a sample of the target population, since they involve only qualitative data, and major trends will usually be confirmed after a few responses.

Employer surveys can provide reliable and usable data provided that they are conducted among employers who have recently recruited vocational and technical training graduates of the program in question. It is relatively easy to identify these employers when surveying graduates, while maintaining confidentiality. The data obtained from the employers directly concerned are more accurate and more useful than those from other sources, for example employer associations, which would provide only general opinions about the quality of training.

The data gathered can be used to measure employer satisfaction with the training of recent graduates. More specifically, the questions might address:

- graduates' mastery of technical competencies
- their mastery of new technologies
- their mastery of more general or cross-curricular competencies (in particular their ability to communicate or work in a team)
- their mastery of their first language (oral and written)
- their mastery of a second language (oral and written)
- their attitudes and behaviours

5.3 Indicators illustrating the effectiveness and efficiency of the system

Effectiveness refers to an organization's ability to produce an expected result. Efficiency denotes the relationship between cost and effectiveness, or between the results obtained and the resources invested to produce those results.

There are many ways of measuring and analyzing the effectiveness and efficiency of a vocational and technical training system. One way is to use performance indicators that make it possible to analyze operating costs from different points of view. A study of the cost effectiveness of the system and its different components, educational institutions and programs, requires that all the appropriate information be gathered. Given the considerable cost of implementing and operating a vocational and technical training system, governments are increasingly questioning their effectiveness and implementing evaluation strategies. Also, with decentralization and the increased autonomy of regions and even institutions, many governments have integrated the concept of accountability. The growing interest in the establishment of indicators to be used as management tools must be seen in this context. Remember that the authorities responsible for VTT must justify the use of public resources.

5.3.1 Performance indicators

Performance indicators must make it possible to measure the achievement of the

objectives included in ministry action plans or major government orientations. These are, of course, important management tools for those responsible for central management, who must ensure the administration of the entire system. They can, however, involve other decision makers if a decentralized approach is taken and if each constituent of the training network has sufficient leeway with respect to financial and instructional management. In countries with a decentralized system, managers of educational institutions are responsible for gathering information and are also the main users of performance indicators. These indicators allow them to compare the effectiveness of their institution with that of others and to make strategic decisions concerning its development. The information thus gathered is therefore intended primarily to support changes. This means that the autonomy of educational institutions is accompanied by accountability for the achievement of common objectives.

In vocational training, performance indicators may include:

- success rates by subject, year, program of study, etc.
- the percentage of a cohort of general education students who enroll in VTT
- training costs per student, program, region or educational institution

To a certain extent, results of surveys of graduates also constitute excellent performance indicators, since integration into the labour market is the main objective of vocational and technical training.

5.3.2 Training costs

Often, concerns about training costs per student, program or educational institution are the impetus for defining indicators.

Most countries develop indicators that make it possible to compare their vocational and technical training system with other national or international systems. These indicators usually involve the following aspects:

- investment in education (private and public)
- investment in vocational and technical training with respect to the budget allotted to education as a whole
- investment in education with respect to GDP
- investment in vocational and technical training with respect to GDP
- the private sector's financial contribution to VTT
- students' financial contribution to VTT

More specific analyses can also be used to compare operating costs by program and student contributions.

For the purposes of comparison, the choices made by reference countries or regions are strategic, given the targeted objectives. Given the significant differences that might exist, special attention should be paid to the particular context of each country with which a system is to be compared.

SUMMARY

If a vocational and technical training system is to fulfill its mission, it must be designed in such a way that its development can be monitored and its results evaluated. In addition, it must have the ability to adapt sufficiently so that, once evaluation has been done, corrective measures or even major changes can be implemented rapidly.

In addition to general indicators about the education system as a whole, vocational and technical training must have its own monitoring and evaluation indicators. These indicators can be divided into three categories:

- indicators illustrating the development and evolution of the vocational and technical training system
- indicators used to measure the degree of training-employment correlation
- indicators illustrating the system's effectiveness and efficiency

Sources of information other than quantitative indicators can also be very useful in evaluating the system's ability to meet society's needs. These more qualitative data, which are necessarily more difficult to interpret, are needed to account for the innumerable facets of a diversified, complex and dynamic system. In a decentralized system with more autonomous educational institutions, they often provide a clearer picture of various projects.

CONCLUSION

A country's vocational and technical training (VTT) system is based on laws and regulations resulting from government orientations and priorities. The implementation of an effective competency-based vocational and technical training system requires planning on the part of the State, in collaboration with its partners. Such a system cannot be based solely on local initiatives and abilities, since its successful implementation requires means and expertise that only a government can provide.

In this context, once a government education policy has been adopted, a series of central management activities must be carried out in order to:

- analyze the labour market in order to establish program offerings that meet its needs at both the qualitative and the quantitative level
- plan program offerings, i.e. the appropriate pedagogical intervention strategies for each program of study, the resources needed to implement the programs and the related admission requirements
- organize training at the national level, taking into account potential sources of funding, the necessary physical and material resources, the resources available in the educational institutions and in any businesses involved, and the professional development needs of the staff responsible for implementing and dispensing the training
- monitor the evolution of the vocational and technical training system and evaluate its effectiveness and efficiency, in particular with respect to graduates' entry into the labour market and the system's general ability to meet work force needs at the local, regional and national levels

Given the importance of these functions for the general behaviour of the system, the central management of training is a determining factor in the operation of a vocational and technical training system. Without an effective administrative apparatus, the overall quality of the program offerings will be compromised. It must be understood that, in order to act as a lever for economic and social development, vocational and technical training must be accessible to as many citizens as possible and meet the specialized work force needs of all socio-economic sectors, at both the qualitative and the quantitative level. Isolated efforts on the part of a few individuals or educational institutions, however practical, cannot make the difference between a faltering economy and prosperity. In order to best meet all training needs, give every citizen an equal opportunity and help reduce regional disparities, the State must integrate the development of vocational and technical training into its economic development policies, directly or indirectly ensuring the administration of the system.

Please note that this document is one of a series of four, including *Government Orientations, Policies and Structures*; *Program Development* and *Program Implementation at the Local Level*.

TRAINING-EMPLOYMENT CORRELATION

Depending on the country's level of industrial development and its demographics, it is difficult, and perhaps inappropriate, to achieve perfect consistency between training and employment.

The operating rules and ultimate goals of the education system are different from those of industry. The education system's actions are focused on the medium and long term and are designed to offer all graduates an equal opportunity to enter the labour market. Although the industrial cycle must be the reference point for the administration of the vocational and technical training system, there are far more fluctuations in this cycle than in the education system, since it must adapt quickly to market developments.

In a country with more than 50 per cent of the population under the age of 20 and with poor economic development, training must be offered in the fields with the greatest economic need, and all educational paths should result in a high level of labour market integration. Once that has been achieved, a training-employment correlation model can be developed gradually so as to support decision making in terms of the development of program offerings.

Any training-employment correlation model should take into account the following two aspects:

The correspondence between programs of study and occupational groups

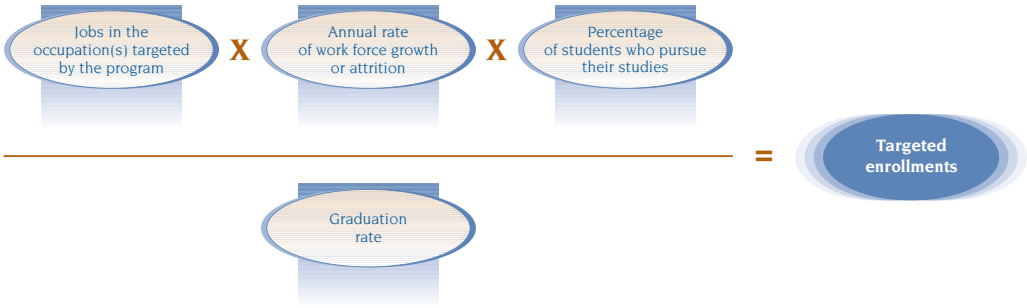
This is a matter of establishing connections between vocational and technical training programs and the trades or occupations in the occupational classification. Since there are usually not as many programs of study as trades or occupations, it may be necessary to produce a table of correspondence in order to establish connections between the programs of study and the trades and occupations to which they might lead.

Targeted and actual enrollments by sector and by program

Targeted enrollments are determined on the basis of connections between the programs of study and the trades and occupations, and of the number of workers enumerated in each case. The result is an estimate of the number of students that should enroll each year in a given program of study so that, at the end of their training, the number of graduates corresponds to work force needs (the goal, of course, is to obtain an order of magnitude rather than a perfect match). Models for predicting work force needs usually take into account needs attributable to attrition and to the foreseeable growth (or decline) of each sector of socioeconomic activity, for each trade or occupation in the classification.

Expressed on an annual basis, these needs are then increased on the basis of the graduation rate in each program and the number of students who pursue their education after graduation and are therefore unavailable to work in the trade in question. This provides the *targeted enrollment* for the first year of each program. Targeted enrollments can also be broken down by program for each region of the country.

The following graph illustrates the calculation of targeted enrollments:



Finally, targeted enrollments are compared with actual enrollments in a program of study in a given year, after which it can be determined whether or not there is an imbalance.

It is important to remember that the results of the model must be interpreted with caution, since the process is based on predicted labour market developments, which always involve some degree of uncertainty, however refined the instruments used.

A needs assessment can identify five situations that characterize the relationship between targeted and actual enrollments for a given program. They are:

- programs for which there is a balance between targeted and actual enrollments
- programs for which there is a surplus of students
- programs for which there is a substantial surplus of students
- programs for which there is a shortage of students
- programs for which there is a substantial shortage of students

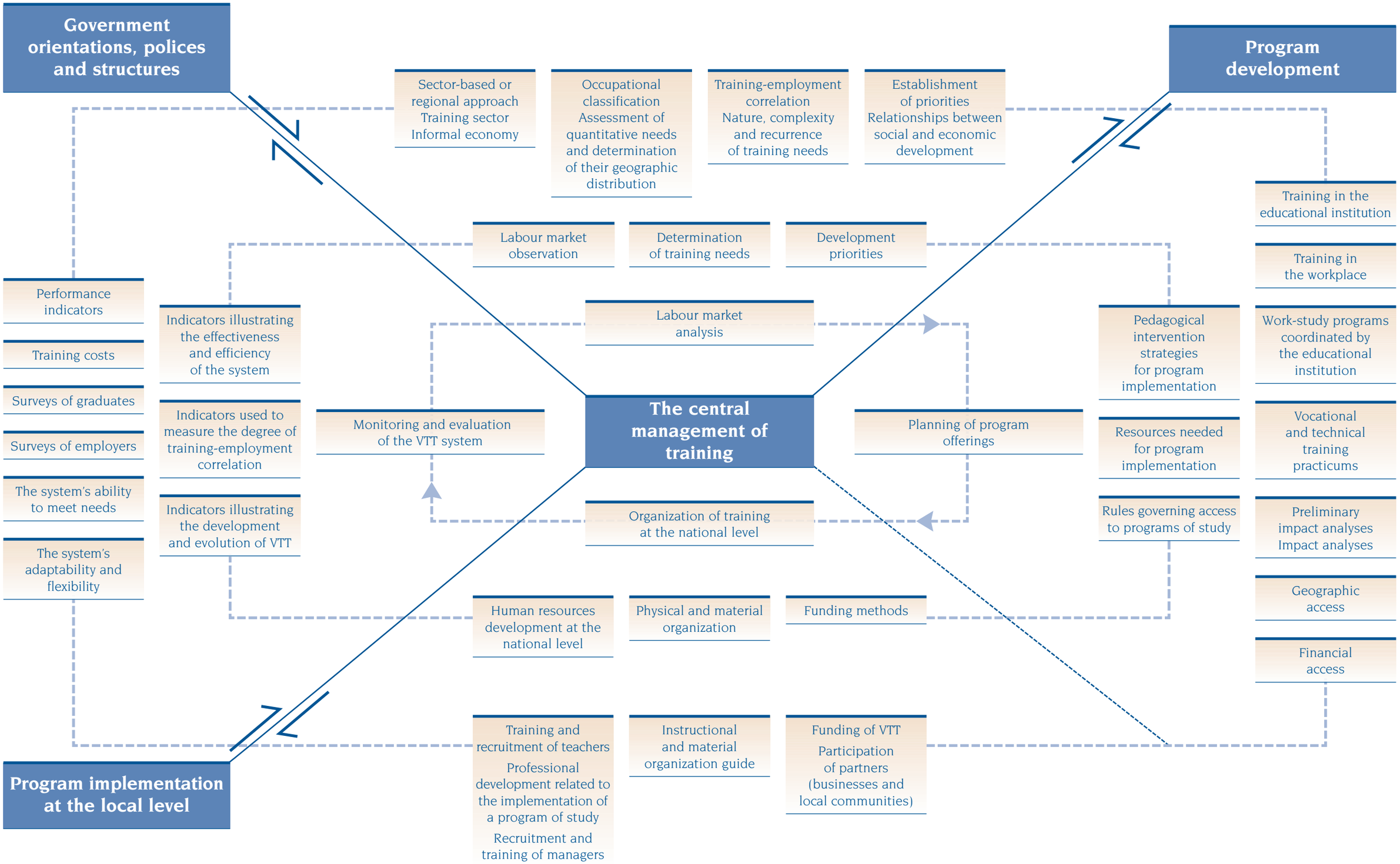
Graduates of programs for which there is a surplus of students with respect to labour market needs may have difficulty finding a job, and many of them will not be able to find one in their field. Conversely, employers will have difficulty recruiting graduates of programs for which there is a shortage of students with respect to needs. The potential disadvantages of imbalances between supply and demand for specialized workers include upward or downward pressure on wages.

Finally, the model can also take into consideration data obtained from surveys of graduates of each program. These indicators can be used to evaluate training-employment correlation after the fact.

The aim of training-employment correlation is to inform regional authorities of the national situation and to involve those responsible at the two levels in the revision and, if necessary, consolidation of program offerings in order to achieve a better balance between training and employment. Among other things, the information gathered from a training-employment correlation model can be used to categorize programs of study in terms of job prospects and to guide students toward the most promising sectors.

APPENDIX 2

Reference card



The engineering of vocational and technical training

Program development

Program development

1 Introduction

Program development is one of the main dimensions of a vocational and technical training (VTT) system. Indeed, program quality is a major indicator of its overall calibre.

The aim of vocational and technical training programs is to help people acquire the competencies needed to practise a trade or occupation so that they can enter the labour market and meet the need for a skilled work force. Consequently, program development is part of the broader process of engineering, which ranges from needs analysis to the evaluation of programs of study and the results of training activities on labour market development.

This section deals with program development as such, i.e. a process that is based on needs analysis and job analysis, and consists in identifying and formulating the competencies required to practise a trade or occupation. These competencies are then translated into objectives and performance standards in a vocational or technical training program.

The process begins with a qualitative needs analysis to determine the type of competency to be developed. This descriptive analysis is crucial and must be as accurate as possible, since it is used to design a training plan containing the competencies needed to practise the trade or occupation in question. Once the proposed training plan has been designed and validated, the objectives and performance standards are developed in a program of study. The final stage in the process involves the production of the instructional support documents needed to implement the program of study.

The above steps are illustrated in Figure 1 and described in more detail in the following sections.

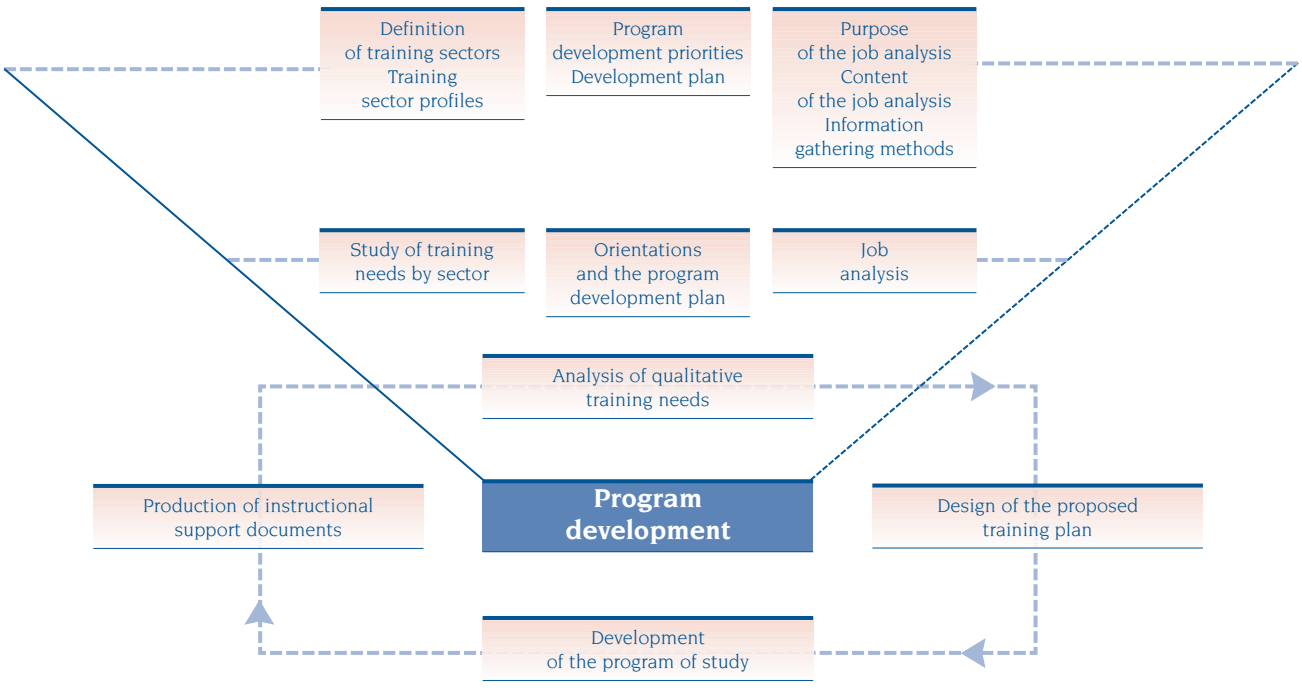
Figure 1 Program development process

2 Analysis of qualitative training needs

The purpose of analyzing training needs is to ensure a quantitative and qualitative correlation between program offerings and work force needs. Training needs are usually analyzed using labour market observation methods and tools designed to achieve a certain balance between program offerings and labour market needs and to ensure a well-proportioned system. In the engineering model presented in this series, this function is part of the central management of training described in Part 2. Essentially, the quality of the training offered depends on the quality of the needs analysis, which in turn depends on relevant data on the labour market and its development. These data can help guide the process with a view to achieving true training-employment correlation.

As illustrated in Figure 2, analyzing qualitative needs comprises three dimensions: analyzing training needs by sector, defining orientations and a program development plan, and analyzing the work involved in the trade or occupation in question (job analysis).

Figure 2 Analysis of qualitative training needs



2.1 Study of training needs by sector

2.1.1 Definition of training sectors

Because economic ministries usually develop a country's occupational and industrial classifications for purposes other than managing vocational and technical training, these classifications are difficult to use. For this reason, it is often necessary to develop a national classification of programs of study by training sector, which groups together programs by type of competency rather than by economic activity.

For example, there is usually no corresponding entry for Electrotechnology and Computer Technology in industrial classifications, since these subject areas cover competencies in a number of economic sectors. Creating sectors of training such as Electrotechnology or Computer Technology makes it possible to structure program offerings according to the similar types of competencies needed to practise trades or occupations, even if these competencies span several different economic sectors.

Defining sectors of training avoids duplicating programs of study with equivalent

competencies that meet the needs of distinct sectors of economic activity (e.g. maintenance electrician, maintenance technician), thereby reducing the number of programs and securing substantial savings. Finally, working in a broader structure than that afforded by sectors of economic activity ensures the development of versatile programs of study. Besides meeting the approval of employers, this method allows students to acquire general competencies that will help them enter the labour market and guarantee them a certain amount of job mobility.

In order to fulfill their functions, however, training sectors must consist of relatively broad groupings of programs of study. Thus, in general, twenty or so training sectors should be enough to ensure an appropriate framework for a vocational and technical training system.

There are several ways of defining training sectors, for example:

- Countries that have already defined and classified economic sectors should use their existing classifications as a basis for defining training sectors, broadening them where necessary to include similar competencies. This will make it easier to analyze labour market needs and establish partnerships.
- Others might find it useful to analyze the structures of countries with similar vocational and technical training needs. In this case, the analysis should focus on the appropriateness of the structure for home use. This process will ensure that the training sectors defined meet the country's specific needs.

2.1.2 Training sector profiles

Once the training sectors have been defined, and the existing vocational and technical training programs have been listed and classified according to sector, the qualitative needs analysis can commence, beginning with the training sector profiles. Training sector profiles consist of qualitative studies that describe the characteristics of the constituent economic sectors and establish relationships with domestic and world economies. They describe the businesses in a training sector and provide information about its potential evolution, its strengths and weaknesses and the issues involved in its development. They list all the trades and occupations associated with the training sector and identify any programs that lead to them. Training sector profiles contain all the relevant information about workers, job prospects and training, illustrating the balance or imbalance between labour market needs and program offerings by analyzing the correlation between training and employment.

To serve as a reference in developing programs of study at the national level, the description of the training sectors must provide a representative view of the situation throughout the country, taking into account the specific characteristics of each region. Thus, a sector profile will provide data on all the types of businesses involved (e.g. by size, degree of automation, region or type of production) and on the characteristics of the work force. A country could elect to establish such profiles for every training sector simultaneously, or for a few sectors at a time. In the latter case, the sectors should be analyzed in accordance with the program development or revision priorities established by the State or the architect of vocational and technical training. The advantage of this strategy is that program development activities are spread out over several years, thereby ensuring that the

programs of study are based on the most recent information possible.

Any number of research methods can be used to establish training sector profiles. One conventional method is a literature search, which is particularly useful in gathering information about economic sectors. Surveys of businesses, workers and educational institutions can also be helpful. Whatever the method used, the resulting training sector profile must make it possible to determine whether there is a balance between program offerings and training needs. Thus, a training sector profile may reveal that there is no program of study leading to a given trade or occupation or, on the contrary, that there are two or more programs of study leading to the same trade or occupation. By evaluating the correlation between training and employment, decision makers can determine the orientations to adopt in developing a training sector and establishing program development priorities.

2.2 Orientations and the program development plan

The portrait of the current situation and the foreseeable development of trades and occupations in a given sector is the basis for defining the orientations that will help establish program offerings consistent with and adapted to work force needs. Among other things, these orientations will help determine program development priorities.

The orientations defined at this stage should make it possible to establish a program development plan based on:

- government orientations that affect work force training (e.g. orientations related to occupational health and safety)
- the orientations of the ministry responsible for vocational and technical training and its partner ministries (e.g. orientations related to access to vocational and technical training for young people or women)
- the particular situation of each training sector

In general, designing a program development plan consists in drawing up a brief summary of the situation in each training sector, based on the conclusions of existing training sector profiles or on the opinion of a committee composed of labour market and education specialists for those training sectors yet to be analyzed. Once this is done, program development priorities for all the sectors combined can then be determined. Thus, the program development plan makes it possible, if necessary, to determine priority training sectors and to establish program development priorities in accordance with government and ministry orientations, the particular situation of each sector and the available resources. Depending on the scope of the reform of vocational and technical training and the available human and financial resources, the program development plan may be spread out over two to five years or more.

2.3 Job analysis

2.3.1 Purpose of the job analysis

The third step in analyzing qualitative training needs is job analysis. Its aim is to gather information about a particular trade or occupation in order to identify competencies and develop a program of study.

2.3.2 Content of the job analysis

Job analysis consists in gathering the most relevant and exhaustive data possible on the training needs associated with a trade or occupation. Its relevance depends on in-depth knowledge of the trade or occupation to which the program leads.

Job analysis is designed to obtain information about:

- the nature of the work, working conditions, requirements for entry into the labour market, job prospects, remuneration, and so on
- the tasks performed by practitioners of the trade or occupation
- the conditions for the performance of these tasks and performance criteria
- the categories of products and expected results
- the work process
- the necessary skills and behaviours

2.3.3 Information gathering methods

There are different ways of gathering information about a job, some of which are more demanding than others in terms of resources and constraints. Whatever the method used, however, it is essential to work in cooperation with businesses in the sector, since it is their training needs that are being analyzed. The most important thing is to consult the appropriate people, that is, those who practise the trade or occupation and their immediate supervisors, and to obtain a representative sample of practitioners. The choice of businesses and individuals should take into account a certain number of criteria, such as number of years of experience, geographical location, the type and size of the business and the proportion of men and women practising the trade.

The following are some of the methods that can be used to analyze a trade or occupation:

A. *Focus groups and their derivatives*

This method consists in bringing together a group of ten to twelve individuals who practise the trade or occupation in order to ask them a series of questions. Enough time should be set aside to gather all of the relevant information. In general, the process takes two or three days, preferably on a consecutive basis.

B. *Interviews*

If it is impossible to bring together a group of workers, information can be collected during interviews in the workplace.

C. *Observation*

Much information can be gathered by observing how a trade or occupation is practised in the workplace. However, this method should be combined with interviews, so that as much information as possible can be gathered.

D. *Job descriptions*

Some businesses have job descriptions by trade or occupation. Although this information is insufficient in itself, it may prove useful during the job analysis. This method should therefore be used in combination with others.

E. *Questionnaires*

A questionnaire addressing the main sections of the job analysis could be distributed to a representative sample of the target population, and the responses compiled and interpreted. In order to prepare a relevant questionnaire on a trade or occupation, however, it is necessary to have some prior knowledge of much of the job in question.

Meeting with one or two experienced workers will make it possible to design a questionnaire covering all of the necessary dimensions.

Except for information gathered in focus groups, whose relevance can be immediately agreed upon, data should be validated by a group of experts in the trade or occupation to avoid wasting time on special cases that are not representative of the overall situation.

SUMMARY

Since the purpose of the training needs analysis is to ensure the correlation between training and employment, it includes both quantitative and qualitative aspects. The quantitative needs analysis is based on labour market observation and is part of the central management of the vocational and technical training system. The qualitative needs analysis is the first step in the program development process and focuses on three aspects.

The first is the definition of training sectors; it is designed to determine work force needs in each sector for which a program of study is to be developed.

The second aspect consists in defining the orientations of a particular training sector and determining program development priorities. These sectoral orientations and action plans are part of the overall vocational and technical training program development plan, which can extend over several years, depending on the scope of the reform and, of course, the available resources.

The third aspect involves a detailed description of the trade or occupation targeted by the proposed training plan. This is the job analysis. The information thus obtained is indispensable in identifying the competencies required to practise the trade or occupation and in developing the program of study. This information can only be gathered from practitioners of the trade or occupation.

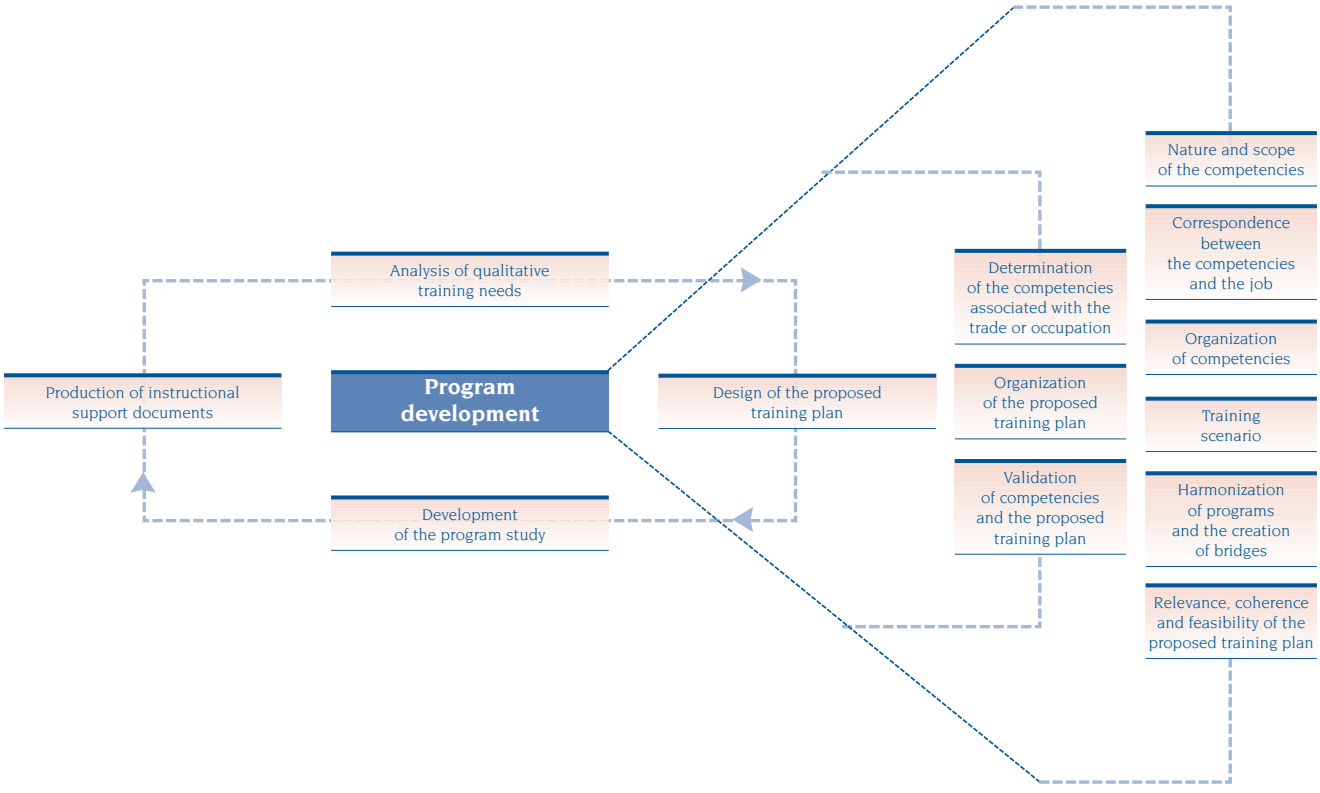
3 Desing of the proposed training plan

The analysis of qualitative training needs, and in particular the job analysis associated with a given trade or occupation, will provide most of the information needed to design the proposed training plan. This information specifies the requirements for entry into the labour market, thereby making it possible to establish a graduate profile. Other determining factors, however, must also be considered when designing the proposed training plan. They include government orientations and ministry objectives with respect to vocational and technical training, the program development framework, and the characteristics of future candidates for the program of study.

Designing the proposed training plan involves:

- determining the competencies needed to practise the trade or occupation on the basis of the information gathered
- organizing these competencies in a proposed training plan
- having the competencies and structure of the proposed training plan validated by education and business partners

Figure 3 Design of the proposed training plan



3.1 The competency-based approach

The competency-based approach to program development is common in vocational and technical training. Basing the definition of programs of study directly on the analysis of training needs as expressed by labour market specialists guarantees that graduates will have the competencies needed to practise the trade or occupation in question.

Essentially, **the competency-based approach consists in defining the competencies inherent in the practice of a trade or occupation and formulating them as objectives in a program of study,** thereby guaranteeing that training is consistent with labour market needs.

The concept of competency has evolved over the years and has been defined in many ways, most of which involve certain basic principles that characterize it as:

- an integrated set of knowledge, skills and attitudes
- that can be expressed as an observable and measurable behaviour
- during the performance of a work-related task or activity
- according to a pre-established performance standard

In other words, the competency-based approach consists in determining, from the outset, the expected results at the end of a program of study and in formulating the

results obtained as observable and measurable behaviours. This approach provides greater consistency between training processes and products and the actual situation in the labour market. By using terms that are more meaningful to employers (competencies, performance criteria, process, expected level of performance upon entry into the labour market, rather than subject content and theoretical concepts), it bridges the gap between the business and education communities.

Programs of study developed according to the competency-based approach are different from traditional programs, in particular because of the performance criteria and the achievement context, which are representative of the trade or occupation.

Competencies possess the following characteristics:

They are **multidimensional**, since they involve a set of knowledge, skills and attitudes that an individual must possess in order to be able to correctly perform a work-related task or activity. Mere knowledge, in the sense of theoretical concepts, cannot be considered a competency. Competencies do include knowledge and intellectual skills, but these must be combined with psychomotor, sensory, affective or other types of skills.

They are **integrative**, since merely possessing a certain amount of knowledge and a few skills does not guarantee competence; the knowledge and skills must be combined. Competencies transform integrated sets of different types of knowledge and skills into an ability to do something, to do it successfully and to make progress.

Finally, competencies are **observable and measurable**, since they are expressed as concrete actions, such as building, operating, designing, analyzing, planning, solving, evaluating and repairing. All of these actions are observable and measurable from a cognitive, sensorimotor or other point of view. The demonstration of the competency therefore lies in the execution of more or less complex processes or results that can be observed and measured against predefined criteria.

3.2 Determination of the competencies associated with the trade or occupation

In order to train competent workers, it is necessary to be familiar with the expectations and requirements of the labour market. The different steps in analyzing qualitative training needs make it possible to achieve such familiarity. The information gathered, however, must be transformed into valid and meaningful competencies. This presupposes an ability to analyze information. Specialists in the trade or occupation must therefore work with training specialists to design a proposed training plan that is truly consistent with labour market needs.

Determining competencies is not an easy task. The steps involved are neither unique nor universal and, together, they constitute a process that is by no means linear. They are:

Analyzing the information

This first step ensures that all the necessary information is available and that each member of the team has an adequate understanding of it.

Collating the information

In general, analyzing information will make it possible to hypothesize about

various ways of grouping data into competencies. For example, information concerning the repair of a machine could be grouped together and then translated into a single competency, "to repair a …" Information related to problem solving could also be grouped together under the competency "to solve problems related to …" If they are to be valid, these groupings must be meaningful in terms of both the training and the work context.

Formulating the competencies

The next step is to determine an appropriate formulation for the competency, which, as we have seen, must be observable and measurable, and represent the performance of a task. Thus, "to understand how to repair an internal combustion engine" is not a competency, since understanding as such is not observable and the formulation does not refer to the performance of a whole task. In vocational and technical training, the competency should be formulated as follows: "to repair an internal combustion engine." This formulation takes into account the different dimensions of the competency, that is, its multidimensional and integrative aspects and its observable and measurable nature.

By analyzing and grouping the information, experts designing the proposed training plan can determine and formulate all of the competencies to be included in the program of study, taking into account the essential requirements of the trade or occupation.

3.2.1 Nature and scope of the competencies

The requirements associated with the practice of a trade or occupation fall into a number of different categories. Some are clear and concrete, such as the requirements for performing tasks. Others, such as communication requirements, are broader and more general in nature. These different types of requirements lead to different types of competencies.

In general, there are two types of competencies: specific and general. Specific competencies are related to the performance of trade-related tasks. General competencies are related to the broader dimensions of work and may be common to a number of trades or occupations. Recognizing these two types of competencies has a number of advantages. It ensures that all aspects of a trade or occupation, not only the most easily identified operational aspects, are addressed. It is also makes learning more efficient, as the general dimensions common to several tasks in the trade or occupation are approached as a distinct competency, rather than as components of a number of competencies. As we will see later on, this approach also favours the recognition of prior learning and continuing training.

The scope of the competencies refers to the breadth of the knowledge, skills and attitudes they relate to. There are no specific rules for determining the scope of a competency; however, the definition of competency, which refers to an observable and measurable behaviour during the performance of a work-related task or activity, could serve as a guide.

Competencies refer to the ability to perform a complete task, in accordance with a performance standard corresponding to requirements upon entry into the labour market. Their development requires an integrated set of knowledge, skills and attitudes. Competencies therefore have nothing to do with the mastery of a single action, an operation or a simple process.

The same criteria of relevance and readability with respect to the requirements of an occupation also limit the scope of the competency. A competency that is too broad will be difficult to associate with the tasks and responsibilities of a trade or occupation. It will also be difficult to observe and measure. Since competencies define expected results at the end of training, they have a direct impact on the quality of learning. Too many competencies of limited scope may result in overlap and repetition, encumbering the training and evaluation processes and preventing the integration of learning. On the other hand, overly general competencies may be less relevant and meaningful for the labour market. In any event, the quality of the programs of study would suffer and graduates would not meet labour market expectations.

3.2.2 Correspondence between the competencies and the job

Identifying the competencies associated with a trade or occupation requires a meticulous approach. To ensure that all of the information and important dimensions of the trade or occupation are included, it is useful to have access to a tool that can help establish correspondences between each competency and available data on the job. This tool could be a table of correspondence establishing relationships between the competencies and each piece of information gathered from the different documents used, in particular the job analysis report and the training sector profile.

Producing a table of correspondence between the competencies in the proposed training plan and the data available on the job will also help determine the content of each competency and ensure that all the competencies are distinct, yet interrelated. Finally, information on the correspondence between the competencies and the labour market situation will be extremely helpful in validating the relevance of the competencies, while information on their content will make it possible to determine the duration of training.

3.3 Organization of the proposed training plan

If the proposed training plan is to be coherent and applicable, it is necessary to establish relationships between the competencies, suggest their order in the proposed training plan, determine the duration of training required to develop each one, and design a training scenario.

3.3.1 Organization of competencies

Since, more often than not, the proposed training plan includes two types of competencies, i.e. specific and general, it is useful to establish relationships between the two. This helps eliminate redundancy and overlap, takes into account the complexity and integration of learning, and provides an indication of how experiential learning may be reinforced and applied in other learning situations.

Different tools can be used to establish and illustrate the relationships between the competencies. These tools provide an overview of the proposed training plan and, ultimately, contribute to the appreciation of its consistency. Consider, for example, the grid of competencies (see Appendix I).

3.3.2 Training scenario

A training scenario will make it possible to evaluate the feasibility of the proposed

training plan. This stage involves organizing the learning associated with the competencies with respect to the time frame established for the training.

At this stage, the duration of training must be estimated for each competency in the proposed training plan. These durations are set in accordance with the relationships established between the competencies and the complexity of the related learning. This systemic approach is designed to ensure that the duration of training is realistic and adequate, and that there is a certain economy in the learning process.

If the duration of training is to be realistic, it is necessary, when establishing the training scenario, to determine the training approaches most likely to be used (e.g. theoretical, practical, in a workshop, laboratory, practicum, work-study).

3.3.3 Harmonization of programs and the creation of bridges

Harmonizing programs of study and establishing bridges between the different levels of training are crucial in order to guarantee the general effectiveness of the system and to avoid the creation of dead-end paths. Harmonizing programs of study facilitates learners' course of studies and the implementation of a continuing training policy.

The training scenario therefore ends with a process designed to study how a program can be harmonized with existing programs and what bridges can be created between the program and higher levels of education or training.

3.4 Validation of the competencies and the proposed training plan

The design stage ends with the validation of the competencies and the proposed training plan. The purpose of this step is to confirm the relevance of the proposed competencies, as well as the coherence and feasibility of the training plan.

To confirm the relevance, coherence and feasibility of a proposed training plan, it is necessary to consult both trade and training specialists. Ideally, representatives of employers and employees in the field (e.g. some of the people who participated in the job analysis, business executives, and association and union leaders) and representatives of educational institutions (e.g. directors, education consultants and teachers) should participate in the validation.

These people are in the best position to evaluate the relevance and quality of the proposed training plan. By coming together, they can clarify points of view and consolidate perspectives. The point of such a meeting is to ensure that every concern, whether of the labour market or the education community, is addressed. It also provides an opportunity to discuss training possibilities and potential partnerships.

More specifically, **the relevance of the proposed training plan** refers to the level of correspondence between the competencies identified and the qualitative training needs associated with a trade or occupation. Evaluating the relevance of each of the competencies makes it possible to determine whether all of the training needs deemed important have been taken into consideration.

The coherence of the proposed training plan can be determined by studying the quality of the relationship between its different components. It also presupposes compliance with the program approach and the consideration of government orientations and ministry goals in terms of vocational and technical training (see Part 1 of this series entitled *Government Orientations, Policies and Structures*).

The feasibility of the proposed training plan refers to its pedagogical, financial and organizational feasibility. It can be determined by examining, among other things, the order of the competencies, the suggested duration of training and the necessary resources. The validation process must make it possible to draw up different scenarios, while specifying the conditions for performance, the nature of the projected program offerings and the cost estimate.

Whereas the relevance of a proposed training plan can be evaluated by labour market representatives, its coherence and feasibility can be validated by education specialists.

SUMMARY

Designing a proposed training plan consists in:

- identifying the competencies needed to practise the trade or occupation, on the basis of the information obtained from sectoral studies and the job analysis
- organizing the competencies within a proposed training plan
- having partners from the labour market and the education community validate the relevance of the proposed competencies and the coherence and feasibility of the training plan

The competency-based approach to program development used in vocational and technical training requires that the competencies needed to practise a trade or occupation be defined along with performance criteria corresponding to the requirements generally recognized for entry into the labour market. A program of study generally comprises two types of competencies: specific competencies, which are directly related to the performance of trade-related tasks, and general competencies, which are broader and can therefore apply to several trade-related tasks or to several trades or occupations.

In order to ensure precision and the greatest transparency possible in the proposed training plan, the development process should include the production of a table of correspondence relating each piece of information obtained from the needs analysis, ministry orientations and the job analysis to one or more of the proposed competencies. This approach will make it possible to organize the proposed training plan, relating the competencies to each other, designing a training scenario and taking into consideration from the outset the harmonization of programs of study and the creation of bridges between them.

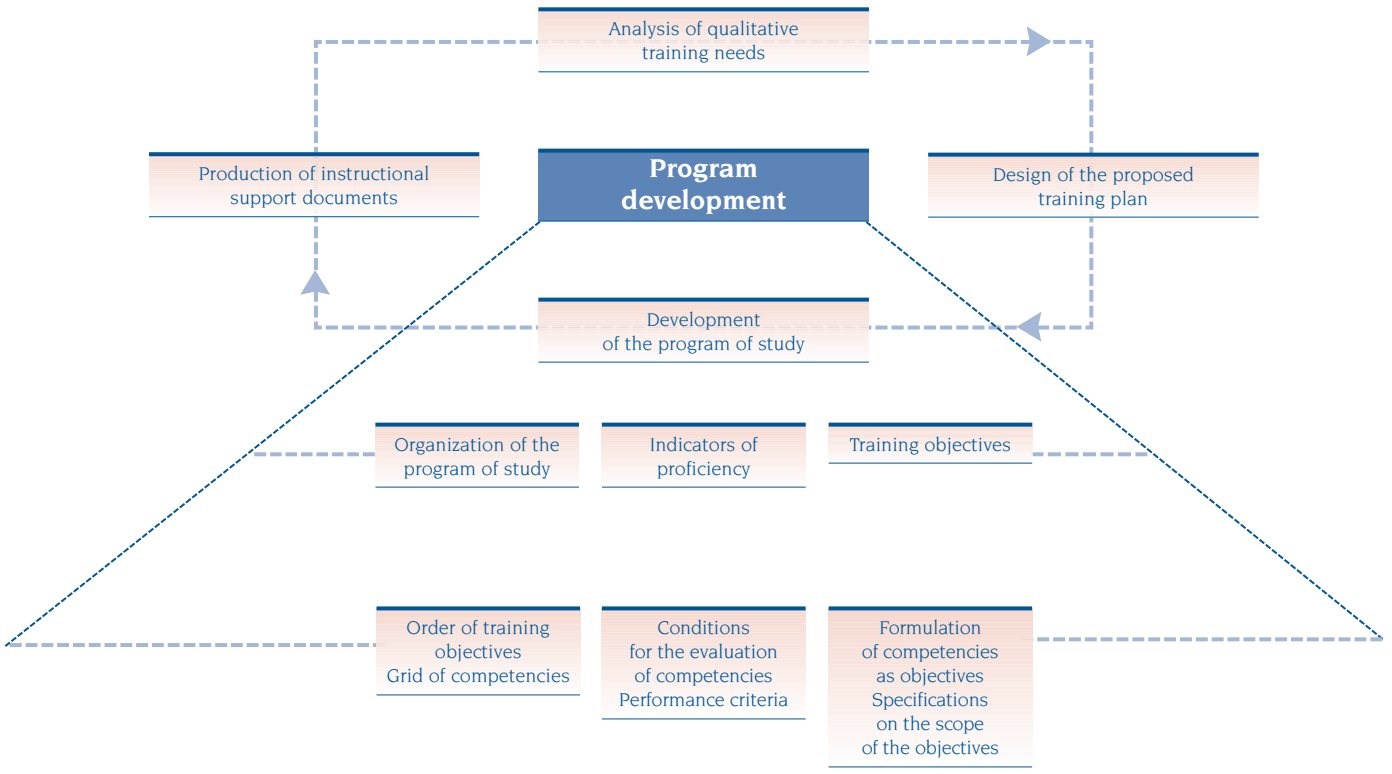
The process ends with the validation of the competencies and the proposed training plan by representatives of the labour market and the education community. The validation establishes the relevance of the competencies and the coherence and feasibility of the training plan.

4 Development of the program of study

The primary goal of the program development process in vocational and technical training is to develop relevant programs of study, that is, programs that will allow individuals to acquire the competencies needed to practise a trade or occupation in accordance with criteria defined by the labour market. The development of a vocational or technical training program is therefore based on the content of the proposed training plan that was validated in the previous step, that is, on the competencies and goals to be achieved. As was the case with the designers of the proposed training plan, the program developers must be either teaching specialists or specialists in the trade or occupation in question.

The program of study takes each competency in the validated training plan and translates it into a training objective accompanied by indicators of proficiency, commonly referred to as performance criteria.

Figure 4 Development of the program of study



4.1 Training objectives

Training objectives are a more accurate description of a program's goals, that is, the competencies to be developed. In the competency-based approach, objectives are not formulated in terms of suggested subject content, but in terms of expected results, that is, the competencies required for entry into the labour market. They therefore correspond to what the student will be asked to do upon completion of his or her training. The objectives describe the competencies and specify the level of achievement to be attained in order to meet the requirements of different workplaces. The objectives also take into account the context in which the training is delivered.

4.1.1 Formulation of competencies as objectives

There are two major types of objectives: one illustrates the process involved in applying the competency, the other describes the major components of the competency. The first type describes the steps in the performance of a specific task in the labour market. Thus, an objective designed to define the competency "to repair an internal combustion engine" could refer to the process or the steps involved in the mechanic's performance of the task:

1 Plan the work to be done.
2 Disassemble the engine.
3 Inspect the components of the cylinder block and head.
4 Repair and replace the components of the cylinder block and head.
5 Reassemble the engine.
6 Determine whether the engine conforms to manufacturer's standards.

The second type of objective specifies the major aspects of the competency. Thus, an objective designed to define the competency "to communicate at work" could include components such as:

1 Express ideas and opinions verbally.
2 Share points of view.
3 Transmit information.
4 Use trade-related terminology.
5 Work in a team.

The decision whether to define an instructional objective as a process or components will depend on the competency in question. What is important is that the objective allows program users to clearly and unequivocally understand the content and scope of the competency.

4.1.2 Specifications on the scope of the objectives

In order to better understand the content and limits of the competency, specifications may be given on the scope of the objectives. Thus, for the competency "to repair an internal combustion engine," specifications could be given on the type of engine and its principal characteristics. For example, the objective could exclude diesel engines or, on the contrary, specifically include them. Similarly, for the competency "to communicate at work," specifications could include dealings with clients. These specifications help identify the limits of the targeted competency and the scope of the objectives. They also allow program designers to make enlightened decisions with respect to the organization of training (e.g. order of competencies, duration of training).

4.2 Indicators of proficiency

Since it is essential to be able to evaluate whether a competency has been developed upon completion of training, indicators of proficiency must accompany the training objectives. In general, these indicators specify the conditions for the evaluation of competencies and the criteria related to the expected performance.

4.2.1 Conditions for the evaluation of competencies

The conditions for the evaluation of competencies specify the situation in which the learner must demonstrate his or her mastery of the competency. These conditions provide information about different aspects, such as the tools and equipment available, the reference materials allowed, work situations and instructions.

The conditions for the evaluation of a competency are intended to reflect the type of work environment the learner will generally encounter upon entry into the labour market. Thus, they guarantee that any graduate will be able to apply the competency in a real work setting. For example, the conditions for evaluating the competency "to repair an internal combustion engine" could include the following specifications:

- working alone
- working on a common engine model
- given specialized tools, instruments and devices and the appropriate technical documentation

4.2.2 Performance criteria

The performance criteria associated with the training objectives are used in evaluating the competencies. They make it possible to establish requirements consistent with the application of the competency upon entry into the labour market. Thus, they guarantee the quality of the diplomas awarded.

The competency-based approach favours criterion-referenced evaluation. The learner's proficiency is measured on the basis of observable and measurable aspects and pre-established performance criteria stated in the program of study and known to everyone. Each individual's performance is evaluated on the basis of the criteria in the program of study. There is no comparison between an individual's performance and that of a group, as is the case in normative evaluation.

Since competencies include an integrated set of different types of knowledge and skills, the measurement of knowledge alone is insufficient to evaluate proficiency. There must therefore be a practical evaluation, that is, a test in a simulated or actual work setting that requires the student to demonstrate all of the knowledge, skills and attitudes involved in the competency. For example, a theory examination on the repair of internal combustion engines would not be sufficient to guarantee proficiency in the competency "to repair internal combustion engines." The student must be placed in a real work context.

Thus, performance criteria involve specific requirements. They define aspects that can be concretely observed and measured. This does not mean, however, that the evaluation of competencies is limited to an examination of the quality of a material production. Performance criteria can involve work processes, as well as intellectual processes. For example, the competency "to analyze electrical circuits" refers to an intellectual process rather than the production of a

good. The performance criteria associated with each competency, while observable and measurable, involve aspects other than a tangible product. These aspects may include accurate calculations, relevant observations, and the accurate location of components in drawings and diagrams.

4.3 Organization of the program of study

The final step in the development of an integrated program of study is to establish relationships between the program objectives that will allow educational institutions to plan their instructional and institutional organization to ensure the consistency of training and the integration of learning. The organization of training objectives ensures that the program of study is structured in such a way as to take into account various factors, such as the duration of training, the type and degree of complexity of learning and the place where learning is acquired.

A program of study is structured using different tools that relate the competencies to each other and ensure consistency between the competencies and the learning objectives. Instruments such as grids of competencies are intended precisely to establish these correspondences.

In its official presentation, a competency-based program of study usually includes the following elements:

- a title, a code and a type of certification
- admission requirements
- a general introduction to the trade or occupation
- the goals of vocational or technical training
- a list of competencies
- objectives and standards for each competency

The program development process ends with this relatively accurate description, which situates the program within its training sector and with respect to other vocational and technical training programs. All of this information, essentially ministry specifications, is used as a formal reference for the educational institutions that will be implementing the program at the local level (see Part 4 of this series). Before a program can be successfully implemented, however, it is necessary to produce instructional support documents.

SUMMARY

The development of a program of study is based on the content of the proposed training plan that was validated in the previous step, that is, on the competencies and goals to be achieved. The competencies are then stated in the form of training objectives. These objectives are accompanied by indicators of proficiency, which specify the performance criteria for assessing expected results and the conditions for evaluating the competencies. These objectives define not the learning required to ensure mastery of the competencies, but rather the outcome expected once the training is completed. Criterion-referenced evaluation, which is the preferred method in the competency-based approach, is designed to evaluate the proficiency of each student upon completion of his or her training, given the performance criteria enumerated in the program of study. It is fundamentally different from the normative approach generally used in education,

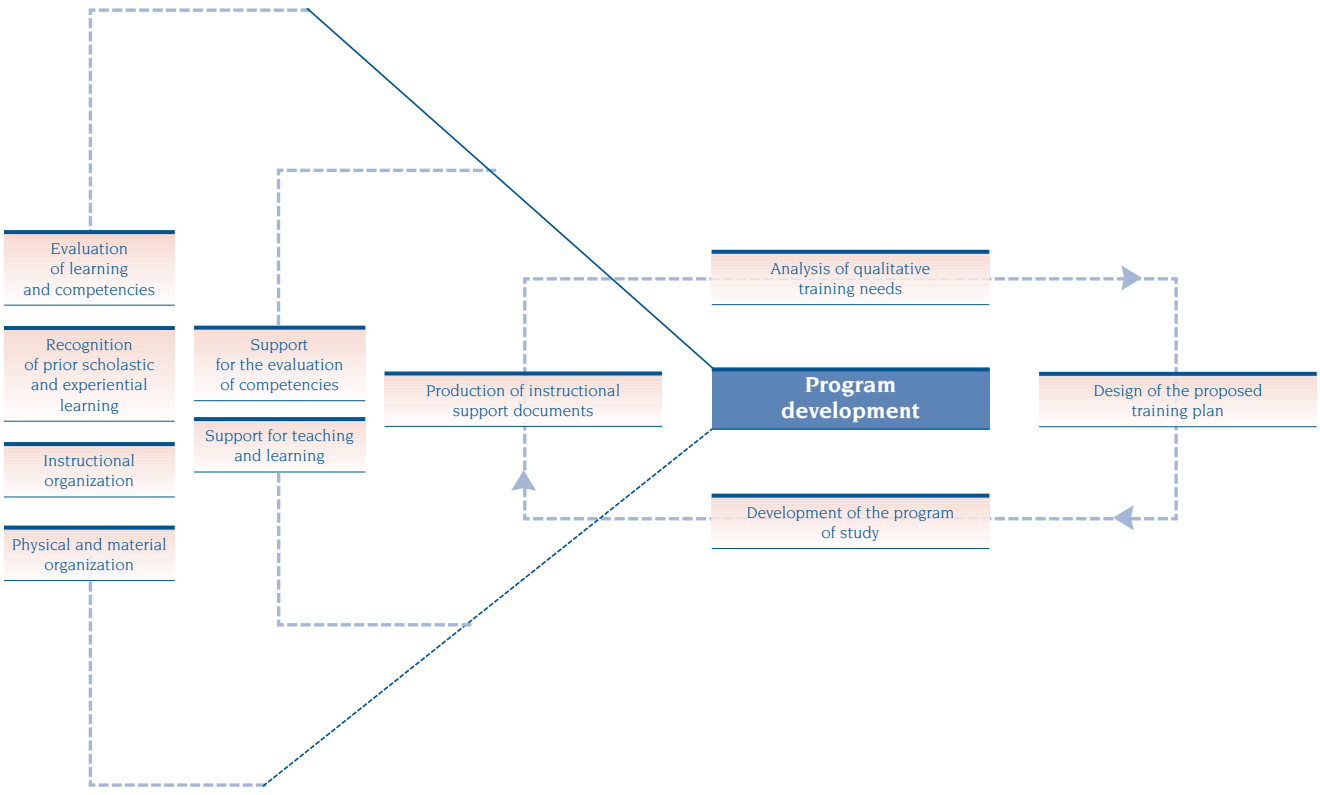
which is designed to evaluate the performance of an individual in relation to that of a group.

Structuring a program of study consists in establishing relationships between the training objectives in order to allow educational institutions to plan their instructional and institutional organization to ensure the consistency of training and the integration of learning. These relationships can be illustrated using instruments such as grids of competencies.

5 Production of instructional support documents

Vocational and technical training programs are usually developed by a ministry or a certified government authority in order to best meet training needs throughout the country. Responsibility for program implementation, however, lies with the different educational institutions throughout the territory, that is, with a majority of people who did not participate in the program's design and development. In this

Figure 5 Production of instructional support documents



context, the successful implementation of a program of study requires significant instructional support in order to facilitate the achievement of the targeted objectives in each institution. More often than not, this support takes the form of teaching/learning and evaluation guides. These documents provide complementary information, allowing the implementation team to make enlightened decisions concerning instructional and institutional organization for both teaching and evaluation activities. These documents usually address:

- material organization
- instructional orientations
- the evaluation of learning and competencies
- the recognition of prior scholastic and experiential learning

5.1 Support for teaching and learning

The competency-based approach in vocational and technical training calls for innovative pedagogical strategies that go beyond traditional teaching methods such as lectures, which are unsuitable for observing and measuring the development and mastery of competencies in contexts resembling actual work settings.

As was mentioned earlier, competencies are multidimensional and the learning to be acquired in a program of study involves not only the acquisition of knowledge, but also the development of skills and attitudes as an integrated whole. The competency-based approach therefore requires a different teaching approach, which must be oriented more toward learning than toward teaching as such. The role of teacher is now to guide and accompany the learner in his or her learning. Of course, the role or responsibility of learners has also undergone fundamental changes. Students are now responsible for the development of competencies inasmuch as they must take advantage of all the resources made available to them. This requires considerable autonomy and a profound commitment to the desired goal.

In vocational and technical training, teachers must have both solid theoretical knowledge and extensive practical experience. Whether they teach automobile mechanics or cooking, teachers must have the appropriate training and, preferably, have practised the trade or occupation for at least several years.

The quality of a program's implementation and of the training provided, and the accuracy of the evaluation, will be enhanced if the ministry or agency responsible for program development supports the educational institutions in implementing the program by providing them with instructional and material organization and evaluation. It is important to realize that the classroom is no longer the only place in which training occurs: laboratories, specialized workshops and the workplace itself are also indispensable places of learning.

5.1.1 Instructional organization

In the competency-based approach, teaching and learning strategies are selected in accordance with student progress. Breaking down learning activities on the basis of a subject's internal logic is no longer appropriate in such a training context.

The aim is now to establish connections between general and specific learning, to promote their integration and the transfer of learning from one course to another. These training approaches require the real collaboration and sustained cooperation

of all teachers. Courses are therefore not broken down according to the subject to be taught, but according to the learning to be acquired. The knowledge, skills and attitudes to be acquired are grouped into courses according to the grid of competencies developed in the organization stage of program development (see section 4.3). These groupings are designed with a view to making the learning process more efficient, while taking into account the level of complexity and integration, as well as the transfer, of learning. Courses are also broken down on the basis of material resources and the different training facilities.

5.1.2 Physical and material organization

Competencies in vocational and technical training can neither be learned nor developed without access to the equipment, tools and materials used in the trade or occupation in question, a fact which often entails considerable—and unavoidable—expense. Competencies that meet the requirements of the labour market can only be developed in an environment resembling the actual workplace. That is why it is essential to consider the organizational feasibility of learning during the program development phase. Do the educational institutions have the necessary laboratories, workshops and other facilities and equipment? Can partnerships be established with businesses in the region in order to share physical and material resources? Do the educational institutions have the human, material and financial resources needed to implement the program of study? These questions must be asked throughout the program development process.

Defining the conditions for physical and material organization is essential for planning the implementation of training in those educational institutions that will be authorized to offer the program of study.

The feasibility analysis carried out in the second step of program development, that is, during the design and validation of the proposed training plan, makes it possible to estimate physical and material organization needs and to consider the necessary facilities.

Competencies requiring expensive physical and material resources may need to be acquired outside the educational institution, in the labour market. Such a decision, however, must be made in conjunction with labour market representatives, since it requires the cooperation of socioeconomic partners (e.g. practicums, work-study programs). Parts 2 and 4 of this series, which deal with the central management of training and program implementation at the local level, address partnerships between educational institutions and businesses in detail.

This preliminary analysis makes it possible to estimate physical and material organization needs, given the training approach adopted, as well as implementation costs, with a view to guiding decision making.

It is only after (or during) the program development process that the designers/developers can produce a more detailed instructional support document for the educational institutions that will be implementing the program. This document, referred to as an instructional and material organization guide, may address the need for:

- human resources (especially teachers)
- furniture, tools and equipment
- material resources for the implementation of instructional projects
- facilities (the construction or renovation of classrooms, laboratories or workshops)

5.2 Support for the evaluation of competencies

As we saw earlier, defining the objectives associated with the competencies of a program of study involves specifying performance criteria and the conditions for performance evaluation. Support for evaluation consists in providing educational institutions with the tools needed to interpret these conditions and indicators unequivocally and to evaluate mastery of the competencies according to the letter and the spirit of the program of study. These support documents can also be used for the recognition of prior scholastic and experiential learning.

5.2.1 Evaluation of learning and competencies

The competency-based approach places the learner at the centre of the training process, making him or her accountable for his or her learning. This approach has changed the very concept of evaluation, which now comprises two complementary but distinct functions: to further the learning process by measuring and evaluating progress (formative evaluation) and to certify studies by measuring the degree of proficiency in the competency at the end of training (summative evaluation).

Formative evaluation is an integral part of the learning process and is done every day. It consists in gathering data in order to determine the students' strengths and weaknesses so that the teaching approach can be adapted to favour the progression of learning. It allows the teacher to provide the necessary feedback so that students can progress until they have mastered the competency.

Formative evaluation is an exceptional tool for reinforcing and consolidating learning. The results of formative evaluation, however, cannot be used for the certification of studies, since it does not allow for the observation of the performance of a complete task involving an integrated set of knowledge, skills and attitudes corresponding to the targeted competency, but only of one or more aspects of the competency. Formative evaluation is not used to measure performance, but to observe the learning process and correct errors.

Summative evaluation is used to determine whether the student has mastered a competency or not at the end of a program and to determine the appropriate certification. In general, this certification is dichotomous in nature: it states whether a student has passed or failed, is proficient or not in the competency. The competency-based approach is aimed at success, hence the importance of formative evaluation, which provides both teacher and student with a daily evaluation of the student's mastery of the different elements of learning. Formative evaluation makes it possible to adapt teaching in order to favour the progression of learning and to ensure the consolidation of learning essential to the process. In this context, summative evaluation, which consists in an examination allowing the student to demonstrate his or her proficiency in the competency, should be used only

to confirm the successful completion of training. If the student fails, remedial teaching and a makeup examination may be envisaged.

The competency-based approach favours *criterion-referenced evaluation*, in which the performance of a task is judged with respect to a performance standard or criteria determined when the objectives were formulated. This standard is consistent with the requirements for proficiency in the competency. Thus, criterion-based evaluation makes it possible to determine a student's success with respect to a performance standard established and validated by labour market specialists. The student's performance is compared not with that of other students, but with expected results that have been demonstrated and illustrated several times during the learning process.

Finally, the performance standard specifies the conditions under which the student's mastery of the competency is to be evaluated. In order to meet labour market requirements and to guarantee graduates' competence, the conditions for performance evaluation are defined on the basis of the actual context in which each competency is applied in the workplace. Indeed, summative evaluation should be carried out in an environment that resembles the actual workplace as closely as possible.

Different instruments are used in criterion-referenced evaluation. These instruments may be designed in full or in part by the ministry or national agency responsible for program development and proposed to educational institutions in an evaluation guide. This responsibility may also be completely decentralized and assumed by the educational institutions. In any event, those who develop examinations will find the necessary information in the objectives, performance criteria and achievement context in the program of study.

Analyzing the relevant data in the program of study will make it possible to define possible focuses of evaluation in order to select the most meaningful, since it is impossible to evaluate everything. The selected focuses of evaluation will be included in examinations, perhaps in conjunction with evaluation forms.

Even if this responsibility is delegated to the educational institutions, prototype instruments must be designed centrally so that local training teams can familiarize themselves with the new approach. This is essential for the quality of the system and the credibility of the diploma. Establishing national performance standards requires that the competencies developed be comparable in whatever educational institution or region the program is taught.

5.2.2 Recognition of prior scholastic and experiential learning

The purpose of recognizing prior scholastic and experiential learning is to determine, evaluate and recognize competencies previously acquired by an adult outside the targeted program of study or in the course of his or her life or work experience. In vocational and technical training, the recognition of prior learning allows people to return to school and pursue training adapted to their needs. It can also contribute to adults' professional development by allowing them to change jobs or advance in their careers.

The recognition of prior learning is a means of adapting practices in educational institutions to the specific needs of adults, favouring the progression of learning

directly related to their situation. Indeed, adults who wish to return to school are not interested in repeating what they have already learned and may lose much of their motivation if training is not adapted to their needs.

The competency-based approach favours the recognition of prior experiential learning. The basic principles are as follows:

- Learning acquired by an adult outside the education system can be valid and meaningful.
- Prior experiential learning can be compared with competencies in a program of study leading to a diploma and evaluated on that basis.
- The requirements for the recognition of prior experiential learning are the same as the evaluation criteria in a normal learning situation.
- The methods of certifying prior experiential learning are identical to those used in the certification of prior scholastic learning.

Adults wishing to have prior learning recognized usually put together a portfolio containing:

- their training objectives
- a description of their learning (schooling, life and work experience)
- an analysis and synthesis of their learning
- correlations between their learning and the content of a program of study in order to illustrate the competencies or partial competencies they believe they have mastered
- supporting documents as proof of their learning

The portfolio is analyzed by a team of teaching specialists in the field in question, and the adult is called to an interview. This procedure makes it possible to determine which competencies and partial competencies will be recognized.

The adult may then be invited to demonstrate his or her competencies in an examination, upon the successful completion of which certification recognizing the targeted competency will be awarded.

At the end of the process, a training profile is established to cover all of the competencies in the program of study that have not been mastered. The adult then undergoes training in these competencies in order to obtain the desired diploma.

SUMMARY

Vocational and technical training programs are generally developed by a government authority in accordance with national needs and implemented in different educational institutions by teams that have usually not participated directly in their design or development. Consequently, in order to ensure that program offerings correspond to the targeted objectives, instructional support should be provided for program implementation. More often than not, this support involves the production of companion documents that address teaching and learning, and the evaluation of competencies. These documents provide the information needed to implement and teach the programs of study. They address:

- material organization
- instructional orientations
- evaluation of learning and competencies
- recognition of prior scholastic and experiential learning

CONCLUSION

Identifying competencies and translating them into training objectives are central issues in the engineering of vocational and technical training.

A number of methodologies can be used to produce programs of study. Every country undertaking a reform of its vocational and technical training system must adopt a methodological framework integrating the values and strategic objectives that will guide the educational process. In addition to specifying the approaches and processes to be used to identify and describe the competencies involved in the targeted trades and occupations, the methodological framework must make it possible to determine the characteristics of the programs of study and their relationship with general education and continuing training. It should also specify the level of versatility or specialization required of each program as well as the relationships between training objectives, educational strategies and teaching approaches.

The programs of study and the guides or companion documents produced within the methodological framework will have a direct impact on the quality of training.

In this context, the production of programs of study represents a complex and thorough process. The creation of a central team responsible for the development of programs and instructional materials or for the verification of the standards applied to these productions will contribute directly to the success of the reform.

It would also be helpful to adopt a similar methodology for customized or workplace training. Without requiring as sophisticated a methodological framework, workplace training programs based on an approach similar to the one used in initial training are likely to favour the complementarity of initial and continuing training.

This complementarity will facilitate the use of the initial training program objectives and content in continuing training projects. Similarly, the competencies identified during the development of workplace training projects can help update the content of initial training programs.

If the trades and occupations targeted by the programs of study are to keep pace with technological innovation and new production methods, it is essential that content review and updating mechanisms be adopted in order to maintain or improve the quality of programs of study.

A cycle for updating programs of study could be adopted by taking the technical level of the trades and occupations into consideration. To complement this cycle, labour market partners, in conjunction with the government ministries and agencies concerned, could implement a technical watch program. This watch could focus on the evolution of competencies (qualitative aspect) and on employment development (quantitative aspect). This information will be invaluable in determining priorities.

Please note that this document is one of a series of four, including *Government Orientations, Policies and Structures*; *The Central Management of Training* and *Program Implementation at the Local Level*.

GRID OF COMPETENCIES

The grid of competencies is a double-entry table illustrating the relationships between specific and general competencies, providing an overview of the training based on the program approach. It can also be used to evaluate the coherence of the proposed training plan.

The general competencies in the grid can be found along the horizontal axis and the specific competencies, along the vertical axis. Relationships are established in order to provide for the possibility of applying previously acquired general competencies in learning activities leading to the development of certain specific competencies or in the demonstration of proficiency. Thus, for example, the competency "to establish interpersonal communications" will be applied and perhaps reinforced in the application of the competency "to sell computer hardware."

The relationships thus created make it possible, among other things, to ascertain the importance of the competencies in terms of the necessary learning and to determine their order in the proposed training plan.

GRID OF COMPETENCIES				WORK PROCESS (major steps)					GENERAL COMPETENCIES (related to technology, subjects, personal development, etc.)									TOTALS	
Industrial machinery operation • • • SPECIFIC COMPETENCIES (directly related to the practice of the specific occupation)		FIRST-LEVEL OPERATIONAL OBJECTIVES	DURATION (in hours)	Become familiar with the instructions	Plan the work	Do the work	Carry out quality control	Tidy up	* Interpret technical drawings	* Solve mathematical problems related to industrial machinery operation	* Establish relationships between the product to be manufactured and the production process	Use a computerized workstation	* Carry out the quality control of products	* Avoid occupational health and safety risks	* Do shopwork	* Use job search techniques	Adapt to new types of work organization	NUMBER OF OBJECTIVES	DURATION (in hours)
MODULES	MODULES								2	3	4	5	6	7	8	10	11		
	FIRST-LEVEL OPERATIONAL OBJECTIVES								B	B	B	B	B	B	B	S	B	9	
	DURATION (in hours)								75	60	45	30	60	15	90	15	45		435
1	Determine their suitability for the trade and the training process	S	30	△	△	△	△	△	○	○	○	○	○	○	○	○	○		
9	Handle materials	B	30	▲	▲	▲	△	▲		●	○	●		●			○		
12	Operate conventional machinery	B	105	▲	▲	▲	▲	▲	●	●	●		●	●	●		●		
13	Operate an automated production system	B	105	▲	▲	▲	▲	▲	●	●	●	●	●	●	●		●		
14	Maintain machinery	B	90	▲	▲	▲	▲	▲	●	●	●	●	●	●	●		●		
15	Enter the work force	S	105	▲	▲	▲	△	▲	○	○	○	○	○	○	○	○	○		
NUMBER OF OBJECTIVES		6																15	
DURATION (in hours)			465																900

S : Situational objective
B : Behavioral objective

△ Correlation between a step and a specific competency
▲ Correlation to be taught and evaluated

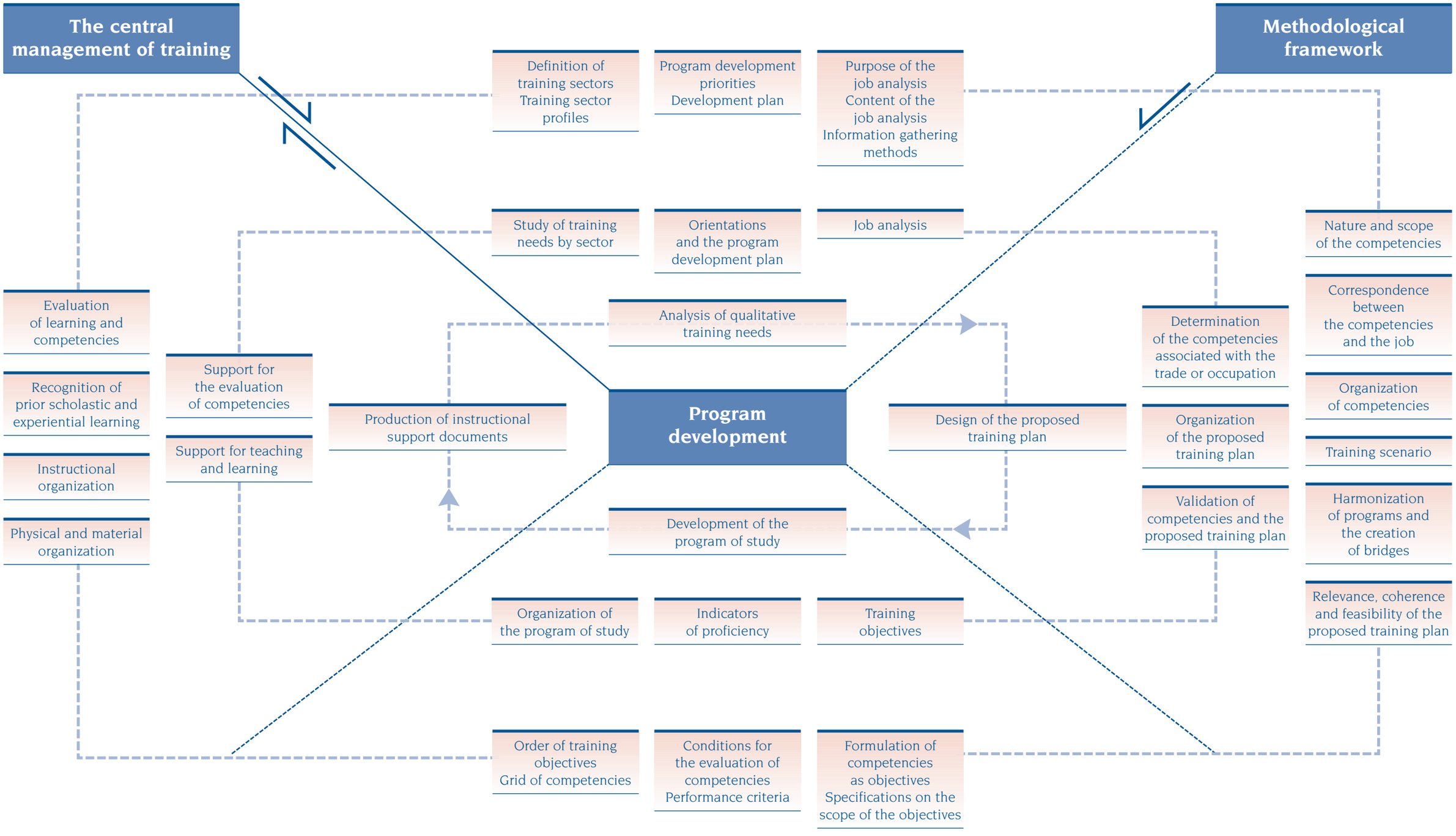
○ Correlation between a general competency and a specific competency

● Correlation to be taught and evaluated

* Competencies harmonized with the DVS in Machining Techniques

APPENDIX 2

Reference card



The engineering of vocational and technical training

Program implementation at the local level

Program implementation at the local level

1 Introduction

Program offerings in vocational and technical training (VTT) are established jointly by the ministry or ministries responsible for vocational and technical training and the educational institutions that provide educational services.

The State's responsibility for strategic planning, program development and coordination culminates in the local implementation of training activities. In most systems, responsibility for implementing training is shared by a regional organizational authority (e.g. academy, governorate, VTT directorate, school board) and a network of educational institutions. There is a clear trend in education systems toward the decentralization of decision making and the accountability of educational institutions. In addition to being an intermediary, the regional authority also translates ministry policy, provides the network of institutions under its jurisdiction with support and facilitation services and promotes cooperation among regional partners. This section pays particular attention to the management of VTT institutions in the context of decentralization and growing management autonomy.

Thus, educational institutions have greater leeway in creating the context in which their students acquire targeted competencies and in offering activities in accordance with the work force needs expressed by businesses and workers at the local, regional, national and international levels.

In an effort to achieve a dynamic balance between centralization and decentralization, educational institutions must offer programs adapted to their students, while taking into account government policy, ministry guidelines and local orientations in the day-to-day management of educational activities. They must therefore have the necessary leeway, competencies and resources to accomplish their mission. The system's effectiveness is dependent on the balance between major government orientations for the development of vocational and technical training and the accountability of the educational institutions in the accomplishment of their mission.

In a competency-based system, educational institutions are characterized by four basic features that result from consistency between government orientations and policies on the one hand,

and the administrative and pedagogical context on the other. They are:

- greater management autonomy
- a learner-based approach to educational organization
- equipment and facilities resembling those found in the workplace
- emphasis on partnership and continuing training

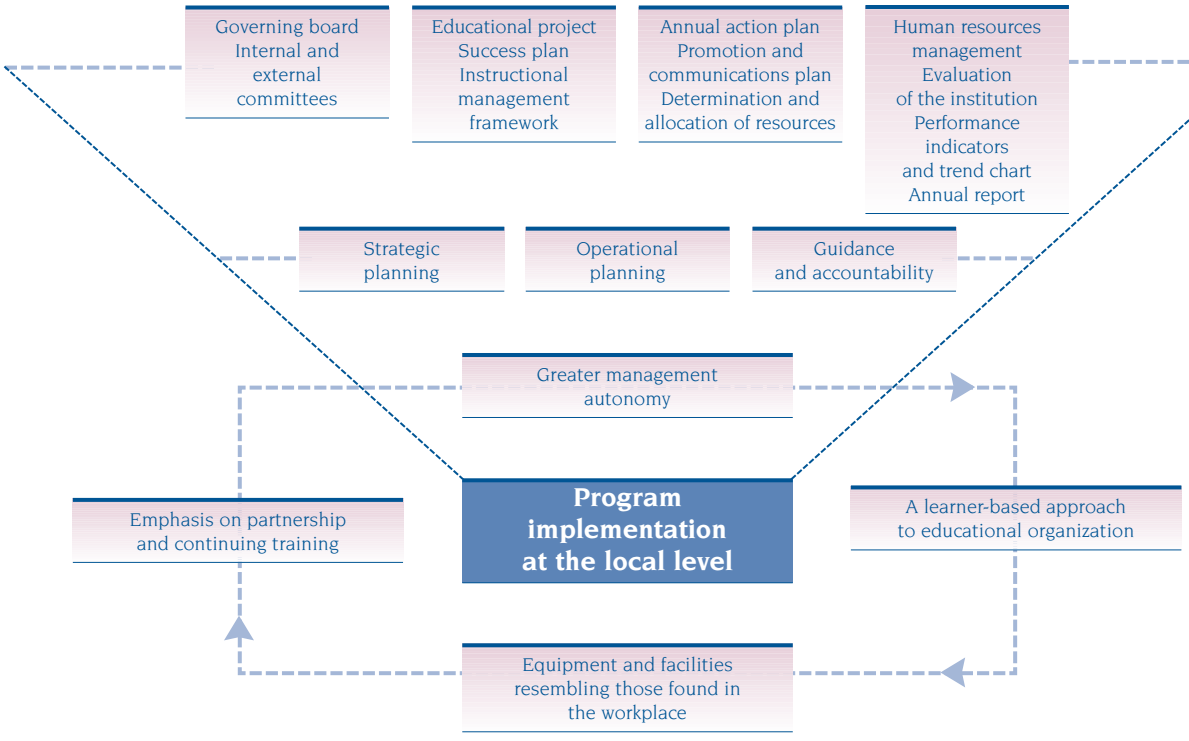
Figure 1 Program implementation at the local level

2 GREATER MANAGEMENT AUTONOMY

Educational institutions are the cornerstone of a training system. The success or failure of the efforts of all the other players involved in the development of VTT depends on the nature and effectiveness of the activities carried out by the educational institutions. This is where major ministry orientations and policies are translated into training services. The institutions must therefore have sufficient management autonomy to make the necessary choices based on their particular characteristics and environment. Faced with local constraints, educational institutions must have access to the human and financial resources needed to implement the programs they offer and to meet the expectations of their partners and their students.

Government orientations and practices should favour decentralization, and therefore greater autonomy for educational institutions and more accountability for managers.

Figure 2 Greater management autonomy



2.1 Strategic planning

Strategic planning consists in developing multiyear action plans based on the mission, context, issues and orientations involved in the management and development of vocational and technical training. As we saw in Parts 1 and 2, strategic planning is the responsibility of the government authorities in charge of designing and developing VTT. The goals and overall objectives of the education system are governed by laws and government policies that determine the framework within which all educational activities take place, regardless of the specific mission of each level of education (elementary, secondary, college or university).

In accordance with government orientations, and as part of their greater autonomy, educational institutions are encouraged to specify what their mission entails at the local level and how they intend to accomplish it. This procedure usually takes the form of an educational project, which illustrates the institution's choices and orientations in the accomplishment of its mission and makes it possible to integrate them into a multiyear plan. In short, the educational project is the institution's strategic plan.

Countries that favour decentralization often set up a governing or advisory council to ensure the joint management of educational institutions.

2.1.1 Governing board

When the State chooses to grant educational institutions greater autonomy, it generally proposes a management structure based on the participation of internal and external players. This structure is called a governing board, and enjoys certain decision-making powers, including the power to approve, monitor and evaluate educational projects. In order to be effective, the governing board should be made up of no more than twenty members. More often than not, it is composed of teachers, students, other members of the institution, representatives of socioeconomic groups and associations and sometimes parents. The institution's administration attends meetings of the governing board but is not entitled to vote.

The governing board's powers and responsibilities are clearly defined in a legal framework (e.g. adopting the educational project, the annual report and the annual budget). In addition, as the body responsible for the institution's operation, it must provide all information required by local or national authorities. Depending on the context, it can make decisions concerning:

- the enrichment and adaptation of centrally developed programs and the development of local programs
- the application of the basic school regulation
- the implementation of student services and special educational services programs
- the time allocation for each subject
- changes to the programming of educational activities
- policies regarding student support and supervision
- rules of conduct and disciplinary sanctions
- the organization of cultural, sports or community services on the premises of the institution

Also, it can give its opinion on:

- changes to the institution's mission
- hiring criteria for staff members
- the choice of textbooks and instructional materials
- any measure designed to facilitate the smooth operation of the institution
- any improvement to the organization of services proposed by the authorities, the community or the socioeconomic sector

With respect to its activities, the governing board can also:

- inform the community about the services offered by the institution and emphasize their quality
- ratify agreements with other educational institutions and businesses
- approve the organization of services other than those provided for in the basic school regulation
- approve agreements with individuals or organizations supplying goods or services
- solicit and receive gifts, legacies, grants and other contributions compatible with the mission of the institution

2.1.2 Internal and external committees

Different internal and external committees provide the educational institution with relevant information for strategic planning and the development of its educational project. Internal committees

made up of teachers, students, parents and representatives of businesses and the community can be set up for a variety of purposes (e.g. instructional or administrative organization, student or recreational activities, school-business relations). These committees can contribute to the ongoing evaluation and reorientation of the institution's objectives. External committees such as sectoral labour committees, regional consultative work force and employment development committees, chambers of industry and commerce, trade councils and interministerial committees are all forums in which the educational institution can share its point of view and learn about the expectations of its different partners. These internal and external committees ensure that the institution is actively integrated into the work force training system.

2.1.3 Educational project

The educational project is the institution's vision of its students' training, which is translated into orientations, priorities and educational practices.

In addition to affirming the institution's commitment to provide quality vocational and technical training based on personal development, the educational project is aimed largely at the creation of a qualified work force capable of contributing to the country's socioeconomic development. Consequently, social and economic partners are usually encouraged to participate in its design.

Indeed, a relevant educational project capable of mobilizing participants requires the cooperation and support of the institution's staff as well as that of local partners and students. A shared vision of the future and a true commitment to action are the basic elements of the educational project. It is a planning tool that:

- clearly defines the institution's goals
- defines the institution's values and pedagogical orientations
- takes into account major social and future trends
- is based on action and serves as a framework for individual and group decisions
- integrates the institution's various activities
- receives constant attention and the appropriate supervision
- is evaluated on a regular basis

The greatest challenge in developing an educational project is to produce a basic reference for everyday teaching/learning activities that truly contributes to students' academic success and integration into the labour market. That is why it is often accompanied by a success plan and an instructional management framework.

2.1.4 Success plan

In many countries, government authorities require educational institutions to produce a "success plan" or a "performance contract" in a results-based contractual approach. The institution is granted greater autonomy but, in return, it must be accountable for its results. The desired results are targets that will be taken into account during the strategic planning stage. When academic success is the educational project's major target, its systematic analysis is integrated into a success plan. Special attention is paid to the students' situation, which is evaluated, for example, in terms of:

- the characteristics of the programs of study offered
- the methods of organizing training
- the monitoring of learning (quality of practicums and remedial training)
- the methods of evaluating learning

More specifically, the staff at the institution is encouraged to gather and compile data on:

- the number of students who receive a diploma at the end of their training (graduation rate)
- the dropout rate and the point at which students are most likely to drop out
- the number of failures by module
- students' behaviour with respect to their learning
- the absenteeism rate
- the placement rate
- feedback from partners in the business community, instructors supervising student trainees and employers

These observations will serve to analyze all of the factors that influence student success and evaluate the institution's performance. A number of elements can be taken into consideration when conducting an institutional diagnosis:

- the student admission or selection process
- the number of years of schooling students have at the time of enrollment
- the activities, technical and instructional materials and facilities
- teacher-student relations
- the students' socioeconomic characteristics
- program requirements and prerequisites
- formative and summative evaluation

The observations made at this diagnostic stage will make it possible to set measurable objectives and specify how they are to be attained. This process results in a success plan that will improve not only the quality of training, but the graduation rate as well. This stage requires the cooperation of the entire staff and the students' participation in the development of the success plan. The diagnosis may reveal intrinsic and extrinsic elements of the institution's educational activities. The success plan should define the specific responsibilities of the institution and of each group of players in order to provide students and the education community with the assistance they need.

Although it focuses on student success, the plan may propose solutions to help promote vocational and technical training among young people and increase female enrollments in traditionally male-dominated trades.

2.1.5 Instructional management framework

As an extension of the educational project, the instructional management framework defines the institution's view of learning and sets out the methods for its application. In a VTT institution, the instructional management framework should take into account two educational parameters, i.e. individuation and the market. While the institution's mission is largely a function of labour market needs and a country's or region's economic development requirements, the role of the education system is to train autonomous individuals, each of them unique and capable of adapting to any number of situations. In addition, these individuals must have the types of competencies

that will provide them with job mobility and allow them to acquire the knowledge demanded by new needs. It is therefore necessary, even before addressing the methods of applying the instructional management framework, to clarify the institution's view of learning and to bear in mind the balance to be maintained between preparing the students to enter the labour market and helping them to acquire basic competencies that can be transferred to other sectors of activity.

The instructional management framework also provides answers to teaching-related questions and specifies how teaching is to be applied and monitored. It determines the conditions in which learning is to take place in accordance with the educational project in order to help students acquire the competencies specified in the programs of study. Among other things, the framework takes into account:

- the content of the programs of study and instructional organization guides
- the rules governing the annual teaching plan for each program of study
- the methods of preparing and teaching courses
- teaching strategies
- remedial approaches for students with learning difficulties
- the regulations respecting measurement and evaluation
- the internal procedure for preparing and administering examinations
- the instructional supervision of teachers
- the probation period for new teachers
- the policy on field trips and complementary activities
- the terms and conditions related to practicums
- the work-study approach

The educational project, the success plan and the instructional management framework are aspects of the strategic planning process and cannot be developed in a vacuum. They rely on the cooperation and partnership of all parties concerned and must be appropriately supervised and regularly and stringently evaluated.

In order to ensure the consistency of training at the local level, the aspects of the strategic planning process described above are integrated into an operational planning process.

2.2 Operational planning

Operational planning consists in translating or integrating the aspects of the strategic planning process into short-term actions related to the organization of training activities in the educational institution. To a certain extent, it involves anticipating needs and planning operations on an annual basis.

2.2.1 Annual action plan

The annual action plan is based on the educational project and specifically targets the activities to be carried out during the management cycle in order to translate the values and orientations set out in the educational project into action. The action plan usually proposes development priorities, specifies objectives, establishes responsibilities and sets deadlines. It translates the educational project and the success plan into concrete objectives for instructional, management and school life activities.

2.2.2 Promotion and communications plan

The promotion of vocational and technical training is always an important objective. Young people must see VTT as a valid career choice rather than something they fall into as the result of failure in school or a disappointing experience with higher education. While responsibility for promotion is shared among several players in the education community and the labour market, educational institutions are in the best position to promote vocational and technical training. They usually have the most recent information about work force needs in the sectors in which they offer programs of study. In addition, they are familiar with their immediate surroundings and know how to effectively contact potential candidates.

Of course, educational institutions derive immediate benefits from this type of activity in direct proportion to their recruitment efforts; more importantly, however, they promote their image in the community and the importance of education and training in the socioeconomic development of their region.

The number of enrollments is a major factor in the viability of VTT institutions, since budgets are generally allocated on the basis of the number of students enrolled. In addition, applications for enrollment in an educational institution are often an indicator of its reputation, since, in many cases, candidates can enroll in the program and institution of their choice. It is therefore important to carefully plan information and recruitment activities on an annual basis.

Generally speaking, educational institutions are authorized to teach certain programs of study in accordance with a map of options established at the national level.[1] Depending on the authorizations granted by the ministry or agency responsible for vocational and technical training, educational institutions must establish strategies and means of informing potential candidates of their program offerings. Potential candidates could include young people or adults already enrolled in general education, or people who are not in school, and who are currently either working or unemployed.

In addition to initial programs of study authorized by the ministry responsible for VTT, most educational institutions offer continuing training or retraining programs designed for workers; in this case, the information and recruitment strategy must be adapted to the target audience. Indeed, every year, educational institutions must develop a promotional plan aimed at all categories of candidates. This plan usually involves:

- preparing and distributing a pamphlet describing the initial and continuing training programs offered, as well as the admission requirements for each program
- developing an advertising plan for newspapers or specialized magazines
- participating in trade shows and conventions, job and recruitment fairs, and career centres
- organizing open houses or student-for-a-day visits
- holding press conferences to promote the institution's activities

[1] See Parts 1 and 2 of this series entitled *Government Orientations, Policies and Structures* and *The Central Management of Training*.

Promotional plans include all of the data likely to encourage students to enroll in the educational institution:

- information about the training offered and the related trades and occupations
- the placement rate of graduates from each program offered
- work force needs by trade or occupation
- career opportunities for women
- graduates' performance and success in the labour market
- work force needs in leading and developing sectors

In order to ensure the effectiveness of its promotional plan, the educational institution must work with a number of partners, including socioeconomic partners interested in the training offered, agencies responsible for retraining and those who provide young people with educational and vocational information. In addition, the institution must be on the lookout for any new labour market needs in order to be able to adjust its program offerings and update its promotional plan accordingly. The objective is to convince people of the added value of vocational and technical training by promoting the educational institution in which it is offered.

The promotional plan is a veritable marketing tool requiring financial resources and an annual review of strategies employed in accordance with changing programs of study, labour market trends and candidates' needs in terms of competencies.

2.2.3 Determination and allocation of resources

The resources that an educational institution can devote to training are determined by analyzing the conditions essential for the achievement of training objectives and the allocations set out in the national budget rules, and by anticipating any income the institution is likely to earn on its own. The allocation of resources depends on the priorities and obligations of the institution, which is being given increasing decision-making responsibility.

Generally speaking, most of the funds available to educational institutions are provided by the State. VTT institutions, however, are increasingly able to access other sources of funding. They can, for example, earn income by organizing training activities for businesses or socioeconomic partners responsible for labour market integration. Included in the budget planning, this supplementary income is generally greatly appreciated.

Determination of resources

The amount of resources allotted to the VTT institution can be calculated on the basis of the number of enrollments in each program of study offered and the requirements of the different programs. For example, automobile mechanics will require more resources than secretarial studies. At the operational planning stage, it is crucial that the amount of financial resources needed to implement training be calculated precisely.

Types of resources

The human, financial, material and physical resources available to the educational institution are used to meet all of the needs arising from its educational activities. At the planning stage, the administration analyzes the institution's educational activities and determines the types and amount of resources needed to achieve the desired results. The educational plan and the resulting action plan sometimes require more resources than those provided for in the national budget rules. These additional needs should be covered by the institution's independent earnings.

Allocation of resources

The resources referred to here are mainly financial and human resources. The allocation of resources is fundamentally important, since it affects the way in which the educational institution carries out its mission. It is therefore important that the right people be assigned to the right positions and that they be given the means to perform their tasks and participate in the implementation of the educational project.

- *Teachers*

Human resources mostly involve teachers, who must be hired to provide training. The employment contract usually specifies the number of hours of teaching, as well as the number of students per group for each program of study. Depending on the programs offered and the number of enrollments, the administration determines the total number of teachers required to teach the courses and evaluate the achievement of competencies in accordance with the requirements of vocational and technical training.

The administration of the educational institution ensures that teachers are appropriately assigned to the different programs and that they have the competencies needed to carry out their mandate.

- *Support staff*

Support staff provide teachers with direct or indirect support. They include stockkeepers, attendants, secretaries, administrative and management staff, and specialists such as education consultants and educational and vocational guidance counsellors.

Each educational institution establishes a resource allocation plan to meet its teaching needs. In a system characterized by administrative and financial decentralization, the administration can make certain choices. It might choose to assign staff to support teaching rather than to other tasks for programs of study that require considerable specialized teaching support. For example, programs in the Administration, Commerce and Computer Technology sector require a technician to manage the computer population. Much of the training in professional cooking and restaurant services takes place in a kitchen or dining room and therefore requires the services of dishwashers. Since each program of study has specific requirements, the composition of the teaching support staff varies from one educational institution to another.

- *Physical resources*

Physical resources refer to the equipment and facilities that must be made available and adapted according to training requirements. They include specialized workshops that must resemble as closely as possible those found in the workplace.

These resources require significant budgets that, more often than not, are allotted when the program is implemented in the educational institution. As much as possible, partnerships should be established with businesses so that training can be provided in the workplace, thereby avoiding the cost of building highly specialized workshops.

Also, funds must be allotted for the maintenance of equipment and facilities. The educational institution's activities are addressed in an annual budget plan that, while establishing certain priorities, tends to distribute the available training resources equitably among the different sectors of activity.

- *Material resources*

Material resources include the raw materials used by the students to carry out the learning activities. Unlike physical resources, material resources are usually not recyclable or reusable. There are, however, ways of recovering the cost of some of these resources by selling products or services. This will be addressed in more detail later on.

Each program requires the purchase of the raw materials, tools and instructional materials needed to develop certain competencies. Thus, at the operational planning stage, the administration allocates the necessary budgets to purchase the material resources needed to teach each program of study.

2.3 Guidance and accountability

Because of their increased autonomy, educational institutions play a greater role in managing human resources and, more often than not, providing new forms of accountability.

2.3.1 Human resources management

Human resources management involves, on the one hand, the contracts or agreements governing employees' work and, on the other, the participation of employees in the educational institution's mission and the resulting action plan.

- *Managing the contract or agreement governing employees' work*

Each employee must meet legitimate expectations with regard to his or her work. Defined according to job category, these expectations specify the responsibilities of each employee and the number of hours in his or her work schedule. Working conditions are generally uniform in each job category. They are often negotiated, entirely or in part, with the different unions at the central level and stipulated in collective agreements. The administration of the educational institution informs each staff member of the work schedule, the compensation procedure and the benefits and obligations associated with his or her position.

Teachers usually have their own collective agreement, which differs from that of support staff and non-teaching specialists. Every term, they are assigned an overall teaching workload. This workload can be divided into courses, hours devoted to supporting, supervising and monitoring students, and hours of availability for complementary activities. All of these data are set down in writing and submitted to the teacher on the date specified in the employment contract.

While collective agreements are negotiated at the national level, more often

than not, the educational institution has a certain amount of leeway at the local level that allows it to adapt the agreement to its training needs and specific operating procedure. Gradual decentralization should be accompanied by greater leeway for educational institutions in managing the workload and work schedules.

If there are no negotiated collective agreements, fair and standardized employment contracts are needed in order to maintain quality training.

- *Managing staff participation and performance*

Managing staff participation is far more complex than applying a collective agreement. The sole purpose of this approach is to ensure that the educational institution and its staff adequately accomplish their mandate to provide the community with quality training services.

It presupposes that the administration has some influence in the community, that it is a leader, and that it is capable of managing change, of developing team spirit, of maintaining effective communication and of relying on the potential and accountability of all players to ensure the smooth day-to-day operation of its educational activities.

Four aspects of human resources management help promote staff participation: mobilization, supervision, feedback, and performance recognition or improvement.

- *Mobilization*

The administration's first challenge is to mobilize staff around the institution's mission, values and objectives. The aim is to encourage every staff member to make a commitment to the educational project. Staff members will participate insofar as they are informed about the educational project, can find meaning for their actions, are given a certain amount of autonomy, can influence decisions, are treated equitably and can clearly see their personal contribution to the collective mission. Successful mobilization requires an effective communication network and consultations with the staff concerning the management of the institution. A participatory management culture will make the entire staff responsible for attaining objectives and encourage each member to find creative solutions.

- *Supervision*

By supervising its employees, the administration ensures that each one of them is accomplishing his or her mandate. To this end, the administration must be aware of what is going on in the institution, particularly in the classroom, and of how closely the activities carried out correspond to requirements. Instructional supervision ensures the harmonious performance of educational activities. It applies to teaching/learning activities, as well as to teachers' performance. Its aim is to detect discrepancies between expected and actual results and to identify their causes. It makes it possible to identify means of maintaining positive discrepancies or attenuating negative discrepancies. Through its influence, the administration transmits its vision of its educational mission, its instructional approach, its management style and its expertise. This requires attention to and interest in what is going on as well as a desire to provide the staff with the resources needed to carry out their tasks. Supervision consists in monitoring, evaluating, reorienting, providing the necessary assistance and continually analyzing all of the instructional practices in the educational institution.

Instructional supervision takes into account the educational environment and involves several steps.

- *Feedback*

Generally speaking, feedback is associated with instructional supervision since, at some point, teachers are required to report on their work. The results obtained with respect to the means used, the climate in the classroom, the attendance of students and the efficient use of material resources and raw materials are all indicators that provide information about the quality of teachers' work. Administrators and education consultants regularly provide teachers with information to help them maintain or modify their pedagogical interventions. This information is not always transmitted formally. It is sometimes transmitted informally, in meetings of different committees or in general meetings, and may be addressed to a group rather than an individual. It is important, however, to provide teachers with formal feedback and to inform them individually of their contribution to the achievement of the shared objectives.

At this stage, the administration informs teachers individually of the effectiveness of their work, establishes specific expectations, acknowledges exemplary contributions, demands improvements if necessary, and suggests support measures.

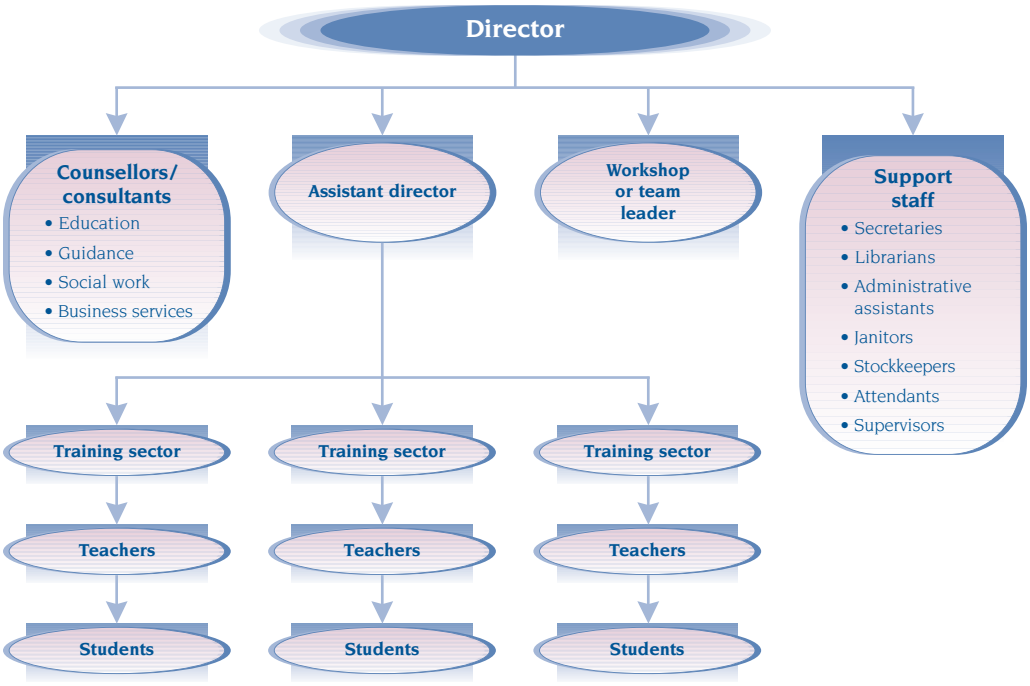
- *Performance recognition or improvement*

Depending on the degree to which the objectives have been attained, feedback will result in measures to recognize or improve performance. Recognition can take many forms, depending on the extent to which objectives have been surpassed. Regardless of the approach used, it is crucial that teachers, individually or as a group, receive recognition and see that their participation and accountability contribute directly to the institution's mission. Similarly, the administration must inform teachers of unsatisfactory performance or behaviour, formulate clear and precise expectations, implement means to remedy problems, monitor the situation on a regular basis, and apply disciplinary measures, if necessary. Performance or behaviour problems are usually dealt with in a structured fashion, providing the necessary support. Disciplinary measures are a last resort, should the entire process fail.

Organization, mandates, roles and responsibilities

A VTT institution needs different types of personnel to ensure the performance of management, supervision, maintenance and teaching tasks. A number of organizational models are possible. For example, the following organizational chart illustrates a conventional model frequently observed in educational institutions.

Figure 3 Organizational chart for a VTT institution



The mandates, roles and responsibilities of each category of personnel are generally defined in the support staff and non-teaching specialist classification plan; the regulation governing the working conditions of administrative staff; and the collective agreements of teachers, support staff and non-teaching specialists.

2.3.2 Evaluation of the institution

With greater autonomy granted to educational institutions, traditional monitoring and evaluation methods must be reviewed. Indeed, while educational institutions are being given more powers and responsibilities, they are also being asked to account to the community and the administrative authorities for the quality of their educational services. There are a number of possible approaches. An effort is generally made to achieve a balance between internal and external evaluation.

Often, the preferred approach is to ask the educational institution to evaluate itself using indicators and criteria proposed by the authority responsible for VTT and to have the evaluation validated by an external body under the same authority or under the jurisdiction of an occupational certification board, an ISO certification board, or another such organization.

The internal evaluation will allow the staff at the institution to analyze its structure and position with regard to its mission and the results obtained with a view to assessing the quality of the services provided and suggesting the necessary corrective measures. This process will help

the staff evaluate the effectiveness of the institution given the country's educational goals. The purpose of the internal evaluation is to improve educational services and ensure the ongoing development of the educational institution, while developing its ability to mobilize the resources of the different players.

As far as methodology is concerned, evaluation should take into account:

- the major national vocational and technical training orientations
- the specific mandates assigned to the institution by the authorities
- the institution's own orientations, as defined in its educational project and translated into operational objectives in its annual action and success plans

The evaluation must therefore take into account national indicators, the mandates of the educational institution and local indicators based on the institution's orientations.

Since the main goal of evaluation is to improve the quality of the educational services offered by the institution, the people responsible for these services must take charge of the evaluation process, taking into account the opinions of partners and employers.

The process begins with an analysis, comparing the actual situation with the desired situation, using the educational project as a reference point. The goal is to identify discrepancies and to adapt or review priorities and actions if necessary. Earlier plans and expectations will be examined in an effort to identify the factors that contributed to or hindered the achievement of the objectives. This analysis is essential for those concerned, since it makes it possible to determine the progress made and to anticipate the means that should be adopted to improve the institution's performance. The evaluation committee will produce a table illustrating the institution's strengths and weaknesses, which it will then submit to the groups concerned in order to verify their perception of the results of the process and to gather their comments.

This evaluation can be used for future action and success plans and can even result in a modification of the educational project or the instructional management framework. What is important is that its conclusions are used to promote the development of the educational institution and to improve its services. The resulting actions can lead to adjustments at every stage of the management process. In light of the results of the analysis, the administration of the institution could reallocate existing resources or attempt to find additional ones. On the basis of the rational analysis of the institution's situation, the different players will be able to legitimately modify their approaches and participate in monitoring the education system in order to keep improving the system at the local and national levels.

In terms of accountability, the complete evaluation process ends with the production of a report. The evaluation report usually contains a statement of the situation, corrective measures and an improvement plan.

Evaluating an educational institution requires time and resources. Although it makes it possible to mobilize players to a certain extent, it also creates tension. While the potential gains are considerable, the different groups concerned, in particular

the administration, may be called upon to make substantial efforts to complete the evaluation. Experience shows that a complete evaluation usually takes about five years. That is why other mechanisms for accountability are used, including annual performance indicators.

2.3.3 Performance indicators and trend chart

Performance indicators are helpful in verifying to what extent an educational institution has attained its objectives and accomplished its training mission. These indicators should provide information on an annual basis so that a trend chart can be produced to illustrate the institution's evolution. Depending on the information obtained, the administration may then proceed with the application of short-term corrective measures.

Performance indicators can be either quantitative or qualitative, depending on the type of information, and are determined on the basis of the aspects to be monitored or evaluated.

The evaluation of students' progress and success is generally based on quantitative indicators such as the success rate, the graduation rate and the placement rate of graduates. The evaluation of administrative processes is based on quantitative or qualitative indicators. The management of financial, physical and material resources is based on quantitative indicators such as financial reports, the equipment replacement rate and the portion of the budget allocated to maintenance. Human resources management is evaluated on the basis of qualitative indicators such as the staff's compliance with the institution's orientations, its commitment to a continuing training process and its participation in the different internal and external committees.

To be relevant and useful, an indicator must result from a need for information related to the objectives of the educational institution and be consistent with local and national orientations. Interpreting indicators always requires taking into account the context surrounding a situation and the way in which the situation evolves.

2.3.4 Annual report

In a decentralized approach, greater management autonomy and accountability necessarily result in the need for regular reports on the institution's performance. The administration must report on its results and choices with respect to student success, the institution's financial health, the instructional practices in effect and relations with its partners.

The annual report may be used for the purposes of accountability. In such a case, it will be addressed to the government authorities, partners and, of course, the education community. It may also be required by financial backers. Since it is important for the institution, it must be the result of a structured approach. Indeed, in decentralized systems, the annual reports of institutions are becoming increasingly detailed.

To ensure the integrity and transparency of the process and to confirm the administration's credibility, every aspect of the report must be accurate. As a means of ensuring accountability, the annual report must follow the rules of effective communication and provide clear and concise information. It is increasingly considered a useful promo-

tional tool in which administrations of educational institutions report on past challenges and activities, and future projects.

SUMMARY

In education systems today, there is a clear trend toward decentralized decision making and greater accountability for VTT institutions.

In an effort to achieve a dynamic balance between centralization and decentralization, educational institutions must offer programs adapted to their students, while taking into account government policy, ministry guidelines and local orientations in the day-to-day management of educational activities. They must therefore have the necessary leeway, competencies and resources to accomplish their mission. The system's effectiveness is dependent on the balance between major government orientations respecting the development of vocational and technical training and the accountability of the educational institutions in the accomplishment of their mission.

Greater management autonomy means that educational institutions play a more significant role in strategic and operational planning, guidance and accountability. These new roles usually result in the creation of a stronger governing board made up of internal and external representatives.

Greater autonomy also requires a revision of traditional monitoring and evaluation methods. Indeed, with increased powers and responsibilities, educational institutions must answer for the quality of their educational services to the community and to the administrative authorities that govern them. Different methods can be used to report accountability and evaluate the performance of an educational institution. Efforts are usually made to strike a balance between internal and external evaluations.

In short, greater autonomy implies a new instructional management framework, the application of elements of strategic planning and institutional evaluation, and, more specifically, the delegation of more important roles to administrative staff.

3 A learner-based approach to educational organization

The educational mission of a VTT institution is to ensure that the young people and adults attending the institution receive qualifying training. This training must promote their entry into the labour market, as well as foster job mobility and adaptability. It should also allow graduates to pursue their studies if they so desire.

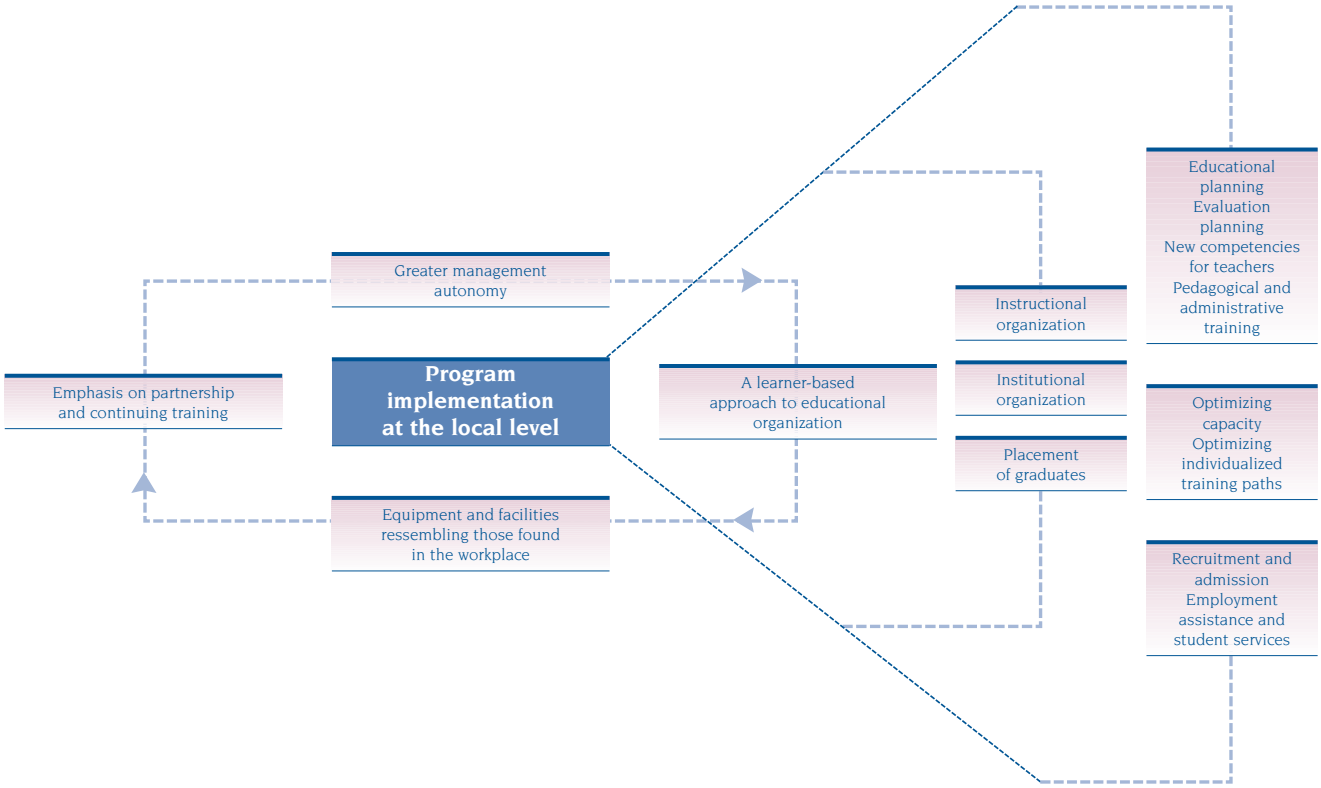
The competency-based approach places the learner at the centre of the learning process, which implies new instructional and teaching approaches. Competency-based programs of study are developed in such a way as to ensure the functionality and versatility of training.[2] They must allow learners to assume all of the tasks and responsibilities inherent in their trade or occupation upon entry into the labour market. To be functional, programs of study must include practical learnings

[2] See Part 3 of this series entitled *Program Development*.

based on the trade or occupation; to ensure versatility, they must also include fundamental and transferable learnings involving technical and scientific concepts and principles that go beyond the mere performance of trade-related tasks. Versatile training facilitates job mobility, adaptation to new situations and career reorientation.

The competency-based approach presupposes a reversal of the situation and a broader perspective with respect to objective-based programs of study. It implies a reversal, because the competency-based approach consists in determining whether the learner has mastered a competency at the end of the learning process, rather than achieved what the teacher expects of the student at the end of a course. It implies a broader perspective, because a competency is a broader concept than an objective, since it integrates knowledge, skills and attitudes. The learner becomes the architect of his or her own learning, and the teacher, a guide or mediator. The concept of competency therefore replaces the traditional focus on teaching with a focus on learning, thereby introducing the concept of responsibility of the learner. Teaching must therefore be focused on the learners and adapted so as to allow them to progress at their own pace.

Figure 4 A learner-based approach to educational organization



3.1 Instructional organization

The competency-based approach is not limited to the program development process, although that is how it is most often presented. Rather, it is a new way of looking at teaching that delegates more responsibility to learners by placing them at the centre of the learning process, enabling them, upon completion of their training, to practise a specific trade or occupation. In VTT, this new approach was introduced with the identification and description of trades and occupations requiring vocational or technical training and the development of programs of study that take into account the main characteristics of competencies. These characteristics, which led to an altogether different formulation of the programs of study, also fundamentally changed the instructional and institutional organization of educational institutions, as well as the role of the teacher and, especially, that of the learner.

As was mentioned earlier, the approach is based on the following characteristics of competencies:

- First, competencies are always defined as the ability to do something rather than the ability to demonstrate one's knowledge.
- Competencies must be applied in an actual work setting, along with all the inherent requirements and constraints (hence the need to involve trade specialists in defining each competency).
- Competencies must be perceived and formulated as the outcome of a learning process that integrates their different components (and not as the learning process itself).
- Competencies must be accompanied by clear and precise performance criteria with which all the interested parties (learners, teachers and others) are familiar, and which make it possible to objectively evaluate the degree of proficiency achieved upon completion of the training.

3.1.1 Educational planning

A competency-based program is an integrated and accurate representation of a trade or occupation. It cannot be defined in terms of technological knowledge. Rather, it must be defined in terms of knowledge directly related to the practice of a trade or occupation. This change in perspective is essential for the successful implementation of training.

All of the teachers and non-teaching specialists involved with a program of study must work together to plan how the competencies will be taught in order to produce a coherent series of learning activities that promote not only the achievement of the objectives of each program module, but also the integration and application of learning as the student progresses.

Practical learning

Given the characteristics of competencies, learning activities should be based on the practice of the trade or occupation and on the production of goods or the performance of services similar to those the learner will be expected to produce or perform upon entry into the labour market. These learning activities should integrate all dimensions of the competency (knowledge, skills and attitudes); in other words, each proposed activity should be analyzed in order to ensure

that it integrates these dimensions in the proper order so that the student can make progress and ultimately master the targeted competency.

In the competency-based approach, the acquisition of scientific or technological knowledge is of no use unless it contributes directly or indirectly to the mastery of one or more of the competencies in the program of study. Whether this knowledge is related to a general competency or a specific competency, the learning activities must integrate knowledge, skills and attitudes and be carried out "just in time." Rather than grouping together several concepts and a vast amount of theoretical knowledge into a sufficiently lengthy course and assigning a specialist to teach it, the competency-based approach consists in determining the knowledge needed to master each targeted competency and integrating it into the proposed learning activities. This is obviously a difficult task and represents a significant departure from traditional teaching; in no way should it be seen as a desire to reduce scientific or technological training to the bare essentials required to practise the trade or occupation. On the contrary, since the new orientations of the vocational and technical training system favour versatility and lifelong learning, the contribution of scientific and technological knowledge must be emphasized and re-evaluated on the basis of its relevance to the practice of the trade or occupation in question. It is no longer a question of training students in a particular subject, but of relating subjects to the development of competencies, which are the result of the integration of knowledge, skills and attitudes.

The integration of knowledge, skills and attitudes associated with the practice of a trade or occupation is far different from the fragmentation of training often denounced in more traditional training models; moreover, it implies a significant change of culture based on teamwork, respect and confidence in the potential of others.

Applying competencies in a work setting

Not only must competencies be demonstrated in a real work setting, they must also be developed or learned in such a setting. In order to master a competency, the learner must acquire and integrate knowledge, skills and attitudes, and the best way of acquiring and integrating the knowledge, skills and attitudes and transforming them into an actual competency is to carry out learning activities adapted to labour market requirements. This is why it is necessary to consult trade specialists while a program is being developed, in particular when analyzing the job situation and validating the proposed training plan.

When planning learning activities, it is important to mobilize the physical, material and organizational resources needed to recreate the work setting and develop the necessary teaching/learning situations so that the students can gradually acquire all of the elements of the competency by integrating knowledge, skills and attitudes and developing intellectual skills.

The proposed learning situations and activities must help the students master the competency by having them apply their learning and their knowledge, skills and attitudes to solve increasingly complex

problems or to carry out projects in a context resembling a real work setting. In order to develop such learning activities, teachers must have mastered the subject content of the program of study, the knowledge on which it is based and, of course, its applications in the workplace.

Teachers must guide their students in the learning activities. This means that they must agree to adopt a teaching strategy consistent with a learner-based approach. Teaching based on the transmission of knowledge must be considered only one of a number of means that can be used to help students progress in their learning. By continually being presented with new and reasonable challenges for which they apply knowledge they have already acquired, students can integrate their learning and make progress.

In addition, students must be capable of finding the information needed to solve problems using clear instructions and all the necessary instructional materials that are safe and adapted to their needs (reference documents, equipment, tools, materials). Teachers must guide their students by helping them select, interpret and understand the information they find in the various resources made available to them. They must also encourage them to think about their problem-solving strategies and help them obtain the expected results, while observing, among other things, occupational health and safety rules. By observing their strategies and asking them the appropriate questions, teachers can encourage students to question their choices, given the targeted objectives. Students need the teacher, whom they see as an expert in the learning content and process, to let them know whether they are on the right track. As much as possible, the proposed learning situations must encourage the students to cooperate among themselves, since teamwork is becoming an increasingly integral part of the practice of a trade or occupation.

Instructional management tools

To help teachers support, supervise and monitor students, competency-based programs of study are accompanied by a certain number of management tools. Others must be produced by individual, or groups of, teachers. The grid of competencies,[3] for example, illustrates the relationships established by the program designers between general and specific competencies. It is a powerful and indispensable tool for integrating, consolidating and, especially, generalizing learning. When analyzed by a team of teachers responsible for different modules in a program, the information gleaned from the grid of competencies allows the teachers to do more than simply introduce students to competencies through isolated learning activities. Indeed, it allows them to situate their teaching within a broader context and to design learning activities that integrate different competencies. A range of increasingly difficult activities with increasingly complex achievement contexts will make it possible to move progressively to situations that resemble a real work setting as closely as possible.

In other words, it is important that teachers of a given program work together to define training activities and learning

[3] See Part 3 of this series entitled *Program Development*.

scenarios. While it is true that the modules of a program stand alone, since they each lead to a clearly defined and complete competency, at the instructional level, there are important relationships between the different modules, and in particular between the general and specific competencies. In any event, the coherence of the training process and the harmonious progression toward increasingly stringent performance criteria require long-term planning by the entire team. Such overall program planning will also make it possible to establish the order in which the different components are to be taught, so that previously acquired competencies can be integrated into the learning situation and serve as a springboard for the development of new competencies. The sequence of learning activities must also take into account the availability of the necessary physical and human resources. An instructional flow chart will help those responsible for institutional organization to establish teachers' and students' schedules, assign rooms, and so on.

3.1.2 Evaluation planning

Evaluation is now an integral part of the learning process and is done daily. It has two different but complementary functions: to support learning throughout the training process (formative evaluation) and to certify studies by determining the student's mastery of the competency upon completion of training (summative evaluation).

For the teacher or team of teachers responsible for a given module, evaluation planning consists in establishing control points and focuses of observation within the learning activities that will make it possible to determine the students' strengths and weaknesses and revise and adapt teaching in order to help students progress in their learning. Of course, it also consists in designing the necessary observation and evaluation tools. These tools will allow the teacher to evaluate the student's mastery of the competency and determine when to recommend the student for summative evaluation.

Thus, evaluation planning is an integral part of educational planning, at least in its "formative" component. Indeed, depending on the student's progress, the teacher will be able to adapt the learning process or suggest that the student start over or pursue the essential learning he or she has not yet mastered.

Summative evaluation

Evaluation planning must take into account the basic characteristics of competencies, which are the cornerstone of the competency-based approach (see section 3.1). The only conceivable way of demonstrating mastery of a competency is by successfully completing a practical examination, administered in a context similar to the one in which the trade is practised and integrating the three dimensions of the competency (knowledge, skills and attitudes) to different degrees. The team of teachers must therefore take up the dual challenge of designing learning activities and evaluation situations that take into account the various dimensions of the targeted competency, and whose degree of difficulty allows the students to comply with pre-established criteria.

Preparing examinations

Although they are evaluated, competencies are not directly observable. The degree to which they have been mastered is

evaluated on the basis of the students' ability to perform a number of tasks requiring the application of the various dimensions of the competencies. Examinations must therefore be prepared according to a logic and procedure consistent with the competency-based approach in order to guarantee an objective and valid judgment on the part of the examiner.

Since competencies are stated as unequivocal training objectives and clear and precise performance standards or criteria with which all parties are familiar, examinations can be prepared by outside specialists. Given the cost of doing so, however, only part of an examination is prepared outside the educational institution, usually by the ministry or agency responsible for program development, and only for certain modules selected for their strategic importance in the trade or occupation. The remainder of the examination is prepared by teams of teachers in each institution.

Of course, these teachers must have received special training in preparing examinations during the implementation phase of the program of study.

Administering examinations

In general, examinations are administered at the end of a learning sequence to an entire group of students at the same time. In some types of instructional and institutional organizations, however, educational institutions stagger examinations so as to administer them in blocks at specific times during the school year. They can then suspend training activities for a few days and devote all human and other resources to evaluation activities.

The competency-based approach allows for individualized teaching and summative evaluation thanks to a stringent and well-documented formative evaluation process that allows the teacher to determine when a student is ready to undergo summative evaluation. To this end, institutional organization and learning tools must favour the students' autonomy.

In a competency-based individualized training approach, the duration of training is not an independent variable. Indeed, awarding credits on the basis of the number of hours devoted to learning or taking courses has no meaning. What matters is whether the students can demonstrate that they have achieved the expected performance standard for proficiency in a given competency, regardless of when or how such proficiency was achieved and how long it took. This is the characteristic of the competency-based approach that makes it possible to recognize experiential learning.

The summative evaluation of learning and the resulting certification are crucial stages in the competency-based approach. The stringency of the process and the accuracy of the certification procedure guarantee the quality of the competencies acquired by students who are likely to be recruited by businesses. This is essential for the credibility not only of the educational institution, but also of the entire vocational and technical training system, if programs are developed by a ministry or national agency and diplomas are awarded by the State.

Managing examinations

In order to ensure the validity of measurement instruments and the unbiased evaluation of learning, a member of the administrative staff must be responsible for the educational institution's bank of

examinations and access to that bank must be limited. The person in charge of managing examinations in the institution is responsible for the following:

- copying documents
- preparing envelopes and distributing them to teachers on the dates indicated in the annual plan and course outlines
- ensuring that the envelopes are returned within the time allotted
- verifying that the pass/fail decision forms comply with expected performance standards
- transmitting marks to the ministry
- archiving the documents

The educational institution must implement a rigorous process for developing and managing examinations in order to ensure that the students have truly mastered the targeted competencies. Indeed, the value of the training provided in the educational institution and certified at the end of the teaching/learning process must manifest itself in the graduates' effective demonstration of the competency in the workplace.

3.1.3 New competencies for teachers

Part 1 of this series indicated that the reform of vocational and technical training is based on new principles:

- greater autonomy for educational institutions with respect to instructional and financial management
- the implementation of competency-based programs
- management of the training system in close partnership with all parties concerned, particularly the labour market

The greater autonomy granted to educational institutions is based on the recognition of the professional competencies of teachers, who are required to work actively with the other members of the school team and the education community. Among other things, they must help define the institution's educational project, the policy on student support and supervision, and the orientations regarding the enrichment and adaptation of programs of study; they must program educational activities and establish a policy for the evaluation of learning.

Moreover, competency-based programs require that teachers themselves master all of the competencies related to the practice of the trade or occupation. They are expected to impart to students the technological and scientific knowledge inherent in the competencies, as well as the skills and attitudes needed to apply them.

In addition, since available resources must be adapted and optimized in today's economy, VTT teachers can no longer work alone behind closed doors. They must collaborate even more closely with businesses to adapt programs of study to the local situation, share equipment, organize practicums in the workplace and develop work-study programs. That is why special attention is paid to the recruitment of teachers. In vocational and technical training, teachers must be selected on the basis of their proficiency in the trade or occupation they are to teach, and they are often recruited in the workplace.[4]

The distinctive nature of the different programs of study and the requirements

[4] See Part 2 of this series entitled *The Central Management of Training*.

of the competency-based approach make it necessary to recruit teachers who are not only qualified in the training sector in question, but are also able to transmit their own competencies to the students and to guide them in their development. Recruiting such individuals is often quite a challenge.

Because of its ties with businesses, the administration of an educational institution is in a position where it can recognize trade specialists who possess these qualifications and might become good teachers. These people are often invited to teach a module or part of a program in the institution so that their potential and interest in teaching can be evaluated.

Those who become teachers have usually received vocational or technical training and are proficient in their field or specialty. When they become teachers, they need instructional support and professional development, mainly in pedagogy and didactics.

3.1.4 Pedagogical and administrative training

Implementing the institution's educational project and instructional management framework depends on the staff members' ability to keep pace and adapt to the many changes affecting the education system. The institution's staff must take new pedagogical and administrative trends and technologies into account. They must also constantly adapt teaching to labour market developments and new needs in terms of competencies. The credibility of the institution is dependent on the students acquiring the competencies they need to meet the labour market's high standards. Professional development is therefore crucial for all categories of personnel.

Educational development

There are two types of educational development. One focuses on teaching as such and addresses purely pedagogical aspects, such as teaching scenarios, learning styles, classroom management, measurement and evaluation, and the use of educational technology. The other is more closely linked to the specific content of vocational and technical programs of study and aims at the development of a teaching approach adapted to vocational and technical training and the specific training sector.

In many educational institutions, teachers receive the support and supervision of an education consultant, whose main functions are to supervise the application of programs of study from planning to evaluation, and to help teachers evaluate and adapt their teaching strategies. Education consultants, alone or in conjunction with outside resources, can organize and conduct professional development activities related to any aspect that affects the quality of training. These activities usually take place on pedagogical days.

Employees in the workplace are the first ones to encounter technological developments or changes in work organization and to develop new competencies. Trade specialists can therefore be invited to work with teachers or to give demonstrations, perhaps over a few days. The administration of the educational institution or a teacher can also reach an agreement with a business to set up a practicum with well-defined professional development objectives.

Educational institutions must establish and implement yearly professional development plans. They must also release the necessary resources and establish partnerships, which are indispensable, since teachers must maintain contact with the workplace in order to update their vocational competencies.

Becoming familiar with the competency-based approach

When competency-based programs are developed and introduced for the first time, teachers, administrative staff and non-teaching specialists must have access to professional development activities. When programs are revised or implemented, teachers must have access to professional development so that they can understand the program objectives and evaluation parameters. Not only must the entire staff be introduced to the general context and economic and pedagogical basis of the approach, they must also be apprised of its advantages, requirements and constraints. They must be informed of the consequences that this new approach may have for the institution. If the approach is to be successfully implemented in the educational institution, each group of specialists must adopt the new teaching philosophy, since it concerns both pedagogy and management and is based on teamwork. The more transparent the process, the more abundant the information and the more adequate the training, the more likely the operation is to succeed.

Ideally, the professional development activities should be facilitated by specialists from the ministry or agency responsible for program development and by teaching specialists who participated in the program's design. If the ministry or agency responsible for program development informs the educational institutions of the three- or five-year plan for the revision of programs and the related professional development, the institutions will be able to set priorities and integrate program offerings at the national level into their annual professional development plan.

Professional development for administrators

Professional development activities intended for the administration of the institution, its support staff and its non-teaching specialists are also essential.

More often than not, administrative staff is required to undergo professional development in administrative data processing. Professional development may also address:

- the admission process
- scheduling
- examinations and the transmission of marks
- budgets
- student assistance
- loans of books and tools

In order to minimize training costs, resources at several educational institutions may be combined to ensure the necessary professional development. To this end, there should be a certain amount of cooperation between educational institutions. There should be an annual professional development plan for administrative staff. Professional development activities are often given in an educational institution with the assistance of specialized resource persons.

3.2 Institutional organization

Since considerable physical and material resources are required to implement practical learning activities for all of the tasks and activities of a trade or occupation, the institutional organization must optimize these resources by offering training to as many students as possible. The traditional view of school and its role in the community must undergo a fundamental change. In vocational and technical training, the educational institution must be viewed as an "educational firm" whose primary goal is to meet students' needs, while serving the public and the local or regional socioeconomic community. The institution must do everything in its power to open its doors to all candidates likely to benefit from vocational and technical training, as well as to all businesses who might eventually hire them.

3.2.1 Optimizing capacity

Constructing or renovating buildings can be very costly, and acquiring tools, equipment, furniture and instructional materials will only be profitable if as many students as possible have access to them.

Integrating services to young people and adults in distinct initial and continuing training systems, supporting the learning system if necessary, and offering business services are all means of increasing the number of enrollments in an institution and optimizing the State's resources. This approach, however, requires the close collaboration of all the ministries or agencies responsible for training.

There are other ways of optimizing the capacity of a VTT institution: opening hours can be extended to accommodate more students using the same facilities and equipment, and training can be provided in different places and using different approaches.

Managing the school calendar and schedules

In a conventional educational institution, the school calendar and schedule of activities are usually modelled on those of general education institutions, that is, they are limited to 200 days a year and five or six hours a day. If these constraints are maintained in a VTT institution devoted to the development of competencies and closely associated with the pace and needs of businesses, they will limit effectiveness and efficiency, as well as the development of the institution. To increase efficiency in the use of equipment and facilities, the school calendar must be revised.

Many countries have adopted a twelve-month school calendar. Training start dates can vary from one program of study to another, depending on the duration of training. It is then easier to take into account the requirements of certain programs whose activities are closely linked to seasonal or economic cycles (e.g. agriculture, tourism).

The calendar of activities in these educational institutions is more in tune with the workplace than the calendar adopted by general education institutions.

In addition to extending the school calendar, educational institutions can optimize the use of equipment and facilities by organizing training so that it takes place from early morning to late evening. If a given group of students receives

training for five to six hours a day, a double schedule will be easy to establish; in exceptional cases, a third shift might be envisaged.

The administration of the educational institution must establish schedules and assign facilities in accordance with the teaching and evaluation plan developed with the different teams of teachers and, of course, in accordance with the institutional organization. The assignment of facilities is closely tied to the teaching plan. In larger institutions, computerized systems can be used to establish schedules and assign facilities and thus make it possible to make the most of the available space and adequately meet teaching needs.

As much as possible, customized training for businesses and training provided by agencies responsible for retraining should be organized entirely according to clients' needs with respect to schedules and the duration of training.

Providing training in different places and using different approaches

The competencies in a program of study can be acquired in an educational institution, in the workplace, or in both, according to a work-study approach.

In addition to making training more realistic, workplace training, and in particular the work-study approach, in which some learning is acquired in the workplace, also increase the VTT institution's capacity. Indeed, the same equipment and facilities can then accommodate more students, and the quality of training is improved.

In some cases, for specific groups for example, distance education and on-line training can provide interesting options. Although these approaches have yet to be developed in terms of vocational and technical training, they can play a strategic role by meeting, if only partially, the needs of adults in continuing training, of populations spread out over a vast territory, and of people with jobs, at a far lesser cost.

3.2.2 Optimizing individualized training paths

The competency-based approach to vocational and technical training, by virtue of its basic characteristics, makes it possible to optimize individualized training paths. Among other things, it helps prevent learners who have encountered failure from repeating a grade or dropping out of school. It also favours individualized training paths, for example, by authorizing temporary leaves of absence without loss or penalty, as well as the recognition of prior scholastic and experiential learning for those who wish to redirect their career.

All of these advantages stem from the modular approach to training, which consists in designing learning activities that integrate all of the dimensions of a competency (knowledge, skills and attitudes). Since training objectives are formulated in terms of well-defined competencies, the evaluation of learning directly related to the mastery of a competency and its certification are independent of other learning targeted by the training plan. The learners' ability to progress individually in their training plan is one of the basic elements of a competency-based training system, and it must be taken into account in the instructional and institutional organization. This approach allows a learner to redo a failed module by facilitating his or her integration into another

group on another schedule, thereby minimizing the impact of the failure on the progression of learning.

The administration of the educational institution must be able to reintegrate learners into the regular training process after a temporary absence or in the case of an exemption from certain modules because of the recognition of prior experiential learning, for example. If these individuals are to join an existing group to complete their training and, despite everything, maintain a certain coherence in their learning and continue to make progress, the instructional organization must favour a certain uniformity or standardization of training activities and establish a precise teaching sequence for the different modules of a program of study on the basis of the instructional flow chart.

3.3 Placement of graduates

One of the most widely recognized means of evaluating the consistency of program offerings with work force needs in vocational and technical training and, consequently, the effectiveness of an educational institution or education system, consists in determining the placement rate in jobs related to graduates' training.

While a VTT institution has as its primary mission to train a competent work force in order to meet its region's socioeconomic development needs, it also has secondary missions. Indeed, VTT institutions must do everything in their power to favour academic success and the integration of graduates into the labour market. To this end, it can adopt a variety of measures, such as promote vocational and technical training, implement an effective candidate selection process allowing students to confirm their career choice and, if possible, avoid false starts, and offer employment assistance. The educational institution is also responsible for evaluating and adapting learning activities in order to make them more consistent with qualitative labour market needs, and increasing or limiting enrollments in order to ensure a certain balance between supply and demand in terms of qualified workers.

3.3.1 Recruitment and admission

VTT institutions are responsible for processing the enrollment applications submitted to them. Each application is examined in order to determine whether it meets the admission criteria set out in the program of study.

Admission requirements are not the same for all vocational and technical programs. In the competency-based approach, the major factors in establishing prerequisites are the complexity of a trade or occupation and the learning needed to acquire the related competencies. Obviously, the establishment of prerequisites or admission requirements should be limited to the requirements of the trade or occupation and the program of study in question, and not include more or less elitist social considerations.

Admission requirements therefore differ for each program of study offered by an educational institution. The establishment and application of the appropriate prerequisites are determining factors in the success of students who are eventually admitted.

Once eligibility has been determined, the educational institution may set additional selection criteria.

This measure may be necessary:

- when the number of enrollment applications exceeds capacity
- when the institution wishes to promote the integration of women into traditionally male-dominated fields
- in the case of work-study programs

Candidates can be selected using a number of tools, such as:

- occupational exploration questionnaires
- aptitude tests
- individual interviews
- places reserved for women

It is important that the admission and selection process be as transparent as possible. To this end, some countries may even set up admission and selection mechanisms that are independent of the educational institutions.

3.3.2 Employment assistance and student services

Because students' personal or financial difficulties can have a direct impact on their academic success and on how long they stay in school, educational institutions sometimes provide employment assistance, vocational guidance and psychosocial assistance services.

Employment assistance

The employment assistance service can help students find part-time work while they are in school or enter the labour market once they have finished their training. Businesses regularly contact educational institutions to recruit their work force. The institution therefore knows about job openings and conditions of employment. The information is collated and disseminated to all students by means of a bulletin board or computer system. The employment assistance service allows the educational institution to observe changes in demand and to confirm regional employment data.

Vocational guidance and psychosocial assistance services

Educational institutions may offer vocational guidance and psychosocial assistance services. Although students are admitted following a selection process designed, among other things, to confirm their motivation, at some point, some students will want to change training paths. In that case, they should be able to count on a guidance counsellor to help them. Social workers deal with problems related to peer relations and academic failure or any other psychosocial difficulty that might hinder learning and the successful completion of the student's training project.

SUMMARY

Competency-based programs of study are developed in such a way as to ensure functional, versatile training. They must prepare learners to assume all of the tasks and responsibilities inherent in their trade or occupation upon entry into the labour market. To be functional, they must include learnings based on the trade or occupation; to favour versatility, they must also include fundamental and transferable learnings involving technical and scientific concepts and principles that go beyond the mere performance of trade-related tasks.

Teaching and evaluation planning require the collaboration of all teachers and non-teaching specialists involved

in a program of study in order to ensure the coherence of learning activities. Such planning also makes it possible to develop instructional management tools that facilitate the support, supervision and monitoring of learners.

Evaluation is now an integral part of the learning process and is done daily. It has two different but complementary functions: to support learning throughout the training process (formative evaluation) and to certify studies by determining the student's mastery of the competency upon completion of training (summative evaluation).

The organization of vocational and technical training, however, requires that teachers develop new competencies and that administrative and support staff adopt new work methods.

Competency-based vocational and technical training requires considerable human, material and financial resources. It is largely dependent on the institutional organization, which must optimize capacity and individualized training paths. Optimizing capacity involves managing enrollments and durations of training, sharing facilities and providing training in different places, and using different approaches.

While a VTT institution is primarily responsible for training a competent work force in order to meet its region's socioeconomic development needs, it also has secondary missions. Indeed, VTT institutions must do everything in their power to favour academic success and the integration of graduates into the labour market. To this end, they can adopt a variety of measures, such as the promotion of vocational and technical training, the implementation of an effective candidate selection process, and employment assistance. The educational institution is also responsible for evaluating and adapting programs of study in order to make them more consistent with qualitative labour market needs, and increasing or limiting enrollments in order to ensure a certain balance between supply and demand in terms of qualified workers.

4 Equipment and facilities resembling those found in the workplace

Vocational and technical training based on the development of competencies associated with semiskilled, skilled or technical trades can take place only in an environment that resembles the workplace as closely as possible. Purely formal or theoretical training would be inadequate, since knowledge alone cannot lead to the acquisition of a competency. A competency is the ability to do something. It must be demonstrated in a particular context presenting real constraints.

The implementation of a competency-based program of study therefore requires that the educational institution make a real effort to recreate workplace conditions within its walls. This involves three major tasks:

- upgrading facilities
- seeing to the physical organization of the facilities, that is, the acquisition and installation of the furniture, tools and equipment needed to acquire the learning set out in the program of study

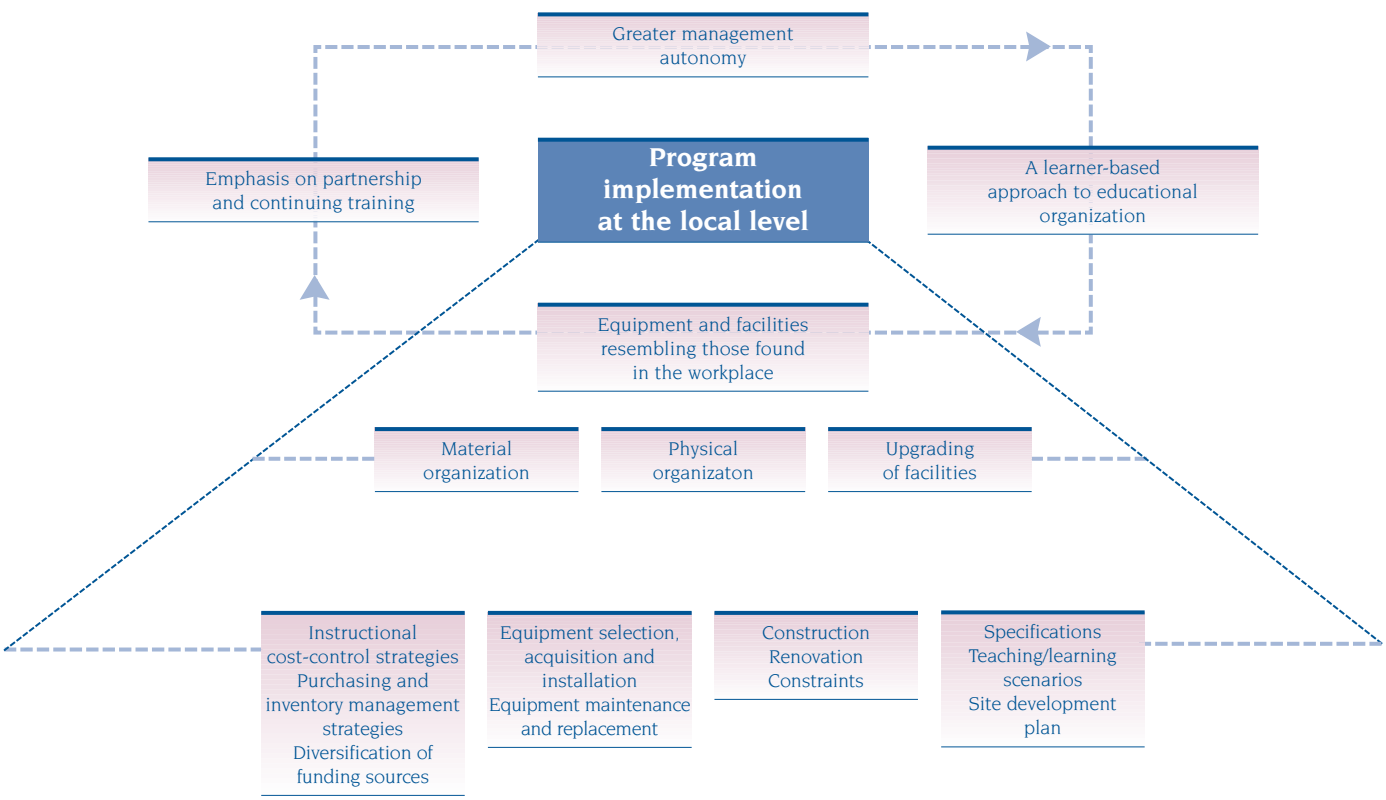
- seeing to the material organization, that is, the acquisition and management of the material resources (raw or perishable materials) needed to carry out the learning activities

Ideally, the ministry or agency responsible for program development should produce an organizational guide or technical specifications for program implementation. Indeed, it is during the program development process that teaching specialists, in conjunction with trade specialists, will be best able to recreate workplace conditions.

At that stage, program developers have access to all the studies describing the economic sector and related businesses, and perhaps even to current production processes and technological and work organization trends. Of course, they also have access to the job analysis report, which, in principle, contains accurate information about the tasks to be performed, their performance context, the resulting goods or services, the equipment and materials used, and so on. Finally, they have established performance criteria corresponding to requirements upon entry into the labour market.

Armed with all this information, program developers can make suggestions as to the equipment and facilities needed to implement their programs.

Figure 5 Equipment and facilities resembling those found in the workplace



4.1 Upgrading of facilities

Every vocational or technical training program involves requirements or constraints with respect to facilities, which must be adapted to the program's specific learning activities. Obviously, the secretarial studies program will not require the same types of facilities as heavy equipment mechanics, professional cooking, early childhood education or hairdressing.

To develop an overall facilities plan involving the construction or renovation of buildings, program developers must first establish specifications for the physical and material organization required to implement the program of study. These specifications provide the information needed to determine the types of facilities required (e.g. classroom, laboratory, workshop, warehouse), the surfaces required for the installation of equipment and the different constraints (e.g. ceiling height, electrical system, compressed air, ventilation).

The first step is to establish teaching/learning scenarios for each competency in the program. How big will the groups be? What will the teacher/student ratio be? (The teacher/student ratio may differ from one program to another.) Will the learning activities be carried out individually, in pairs or in small groups? Would it be possible to plan different learning sequences, so that learners can take turns at the different workstations rather than having a workstation for every learner in the group? Remember that, in the competency-based approach, each learner must demonstrate, in a practical examination upon completion of his or her training, that he or she has truly mastered the targeted competency. It is therefore essential that each individual student have access to the tools, equipment and material resources needed to carry out all of the learning activities in the program.

The answers to the above questions will make it possible to determine the number of workstations needed for each competency or element of a competency, some of which will require two or more different workstations. For example, a competency related to engine repair in the automobile mechanics program might require workbenches for the disassembly and reassembly of stationary engines, as well as workstations in a workshop (garage) for working on vehicles. Scenarios would then have to be developed for the learning activities in order to determine the ideal number of workstations for a group of students and their utilization rate. Note that some workstations can be used for learning associated with several different competencies, as in the case of the workshop or garage in automobile mechanics, which can be used to carry out part of the learning activities for most of the competencies. In such a case, the number of workstations needed can only be determined once scenarios have been developed for the entire program, since it will depend on the utilization rate for each competency in the program.

Once this task has been done for all of the competencies in the program, it will be possible to outline a facilities plan that is functional, adapted to learners' needs, consistent with program objectives and streamlined to reduce implementation and maintenance costs.

This first stage in the analysis process will make it possible to determine the

number and type of facilities needed (e.g. classroom, specialized laboratory, general workshop, documentation centre) and to briefly describe the workstations to be set up given the furniture, equipment and space required to carry out the learning activities.

The arrangement and layout of the facilities could be outlined in order to guide the specialists in their analysis of the furniture, equipment and tools needed. Once it has been determined how much of what type of furniture (e.g. desks and chairs, shelves and storage cabinets, work tables or benches, counters) and equipment (e.g. machine tools, jacks and laboratory instruments for mechanical manufacturing; refrigerators, stoves and sinks for professional cooking; computers and office equipment for secretarial studies) is needed, it will be possible to more accurately determine the surface area required for each room and the related constraints. These constraints might include ceiling height (heavy equipment mechanics) or the need to be on the first floor to have access to the parking lot (automobile mechanics). They might also affect the structure of the building (floors that can support the weight of high-precision machine tools) or the need for essential services (compressed air, high-voltage current, fume exhaust system).

Once these data have been determined, facilities plans can be determined for different areas, taking into account occupational health and safety measures, and the buildings can be constructed or renovated accordingly.

4.2 Physical organization

The physical organization of workshops and laboratories consists in selecting, acquiring, installing, operating and maintaining all the equipment the students need to carry out the learning activities that will allow them to acquire the competencies set out in a program of study.

4.2.1 Equipment selection, acquisition and installation

Designed by the agency responsible for program development when the implementation guides are developed centrally, or by the team assigned to program implementation by the administration of an educational institution, teaching/learning scenarios itemize the necessary equipment, briefly describe its characteristics and estimate its cost and useful life.

All of this information can be entered into a computerized database, which can then be used to determine the number and dimensions of pieces of furniture and equipment and fixed machines to be installed in a given room (surface space needed, volume and safe clearance) in order to determine the size of the room needed. Moreover, a realistic estimate of the cost of acquiring each piece of furniture and equipment needed for each classroom, specialized laboratory or general workshop will make it possible to accurately determine program implementation costs. When implementing a new program, the educational institution must consider all of the estimated costs involved in purchasing the equipment needed to implement the program according to the specifications. When implementing a revised program, it must estimate the

implementation cost by establishing a list of new equipment to be acquired.

Finally, the database containing the list of equipment needed to implement a program of study could include a field indicating the useful life of each piece of furniture or equipment. It would then be possible to determine the amortization of each piece of furniture or equipment on the list and to estimate the average cost of replacing or upgrading the equipment on an annual basis.

This information is crucial for the educational institution's financial planning and management. Better estimates of implementation costs, and especially the equipment replacement cost for each program of study, will help it plan its development and, if necessary, determine training costs per person for each program. This information is essential to monitor and evaluate the effectiveness of the training system.[5]

4.2.2 Equipment maintenance and replacement

A VTT institution offering several different programs of study is somewhat akin to a commercial or industrial business. Its facilities and equipment cannot be managed like those of a conventional school. Managing the different construction, expansion or refitting projects generated by the implementation of new programs or the revision of existing programs, as well as the acquisition and maintenance of facilities and equipment, is an important function. It must be structured, and the responsibilities of each group must be clearly defined.

Upgrading workshops and maintaining and replacing equipment require a maintenance policy and an annual budget envelope. The challenge is not only to construct and equip a workshop, but also to maintain and replace equipment as needed. Partnerships with suppliers and the business community could prove instrumental in obtaining loans or donations of equipment or raw materials, and thus reduce the educational institutions' operating expenses. However, institutions must allocate part of their operating budgets to maintaining and replacing their facilities and equipment.

An educational institution's credibility is also dependent on its ability to provide facilities and equipment consistent with the training needs expressed by the business community. It is therefore important to prepare a structured equipment maintenance and replacement plan for a three- to five-year period, revise it annually and set aside a budget proportional to the institution's income.

Recognizing the importance of maintenance and its management by each of the groups involved (administration, teachers, support staff and students) will help create a true maintenance culture.

4.3 Material organization

Material organization differs from physical organization in that it deals with perishable resources. **Material organization is defined as the process of selecting, acquiring, storing, distributing and controlling perishable materials used by students to carry out learning activities**.

[5] See Part 2 of this series entitled *The Central Management of Training*.

These resources may include food in professional cooking or restaurant services, wood in cabinet making or sheet metal in sheet metal work. They also include all of the non-reusable tools and accessories needed to carry out learning activities, for example, cleaning products in professional cooking; sandpaper, screws, bolts and saw blades in cabinet making; or drill bits, rivets and welding supplies in sheet metal work. Unlike heavy equipment, the cost of these raw materials, tools and accessories, whose useful life is very short, cannot be amortized over several years. They are therefore treated differently, and their full replacement cost is provided for in the training cost estimate for a group of students.

In vocational and technical training, material resources as defined here represent a significant portion of training costs. To master the competencies in a program of study in accordance with performance criteria corresponding to labour market entry-level requirements, each student must use these resources in a number of learning activities to produce goods or services comparable to those produced in the workplace.

Because these resources represent a significant portion of training costs, the educational institution should adopt a management approach to reduce costs while adhering to program objectives. Generally speaking, there are two major types of cost-control measures: instructional measures and purchasing and inventory management measures, the former having a marked impact on the latter.

4.3.1 Instructional cost-control strategies

As we saw earlier, the competency-based approach to vocational and technical training requires that the student carry out practical learning activities in an environment that resembles a typical workplace as closely as possible. If the learning activities and projects are planned and standardized by a team of educators instead of being left to the discretion of each teacher, so that all the students enrolled in a given module of a program are manufacturing the same product, material costs can be considerably reduced.

Consider several individuals teaching the same module at the same time or at different times during the year, each one designing his or her own project without consulting colleagues. They might introduce new projects on a regular basis or assign several different projects at the same time. Some might even let the students choose their own projects. This lack of instructional planning will undoubtedly have an impact on the management and cost of material resources. Indeed, teachers who are used to working this way will demand that the educational institution acquire and store all sorts of raw materials and accessories that might be useful for any project they decide to undertake. The stockroom must be able to supply different materials at a moment's notice. The quantity of stock to be purchased and stored to meet the teachers' needs can quickly get out of hand. Additional costs are incurred not only by the quantity and value of stock, but also by storage requirements (space taken up, storage and handling equipment) as well as by the custom of buying in small quantities. The quality of service may also be reduced because of the lack of planning, resulting in shortages, which will inevitably be felt when the materials are needed most.

When all of the teachers responsible for a given module work together to design one or more standardized projects, however, material resources management is far less difficult. From a pedagogical standpoint, the projects selected are more likely to correspond to the targeted objectives and established performance criteria, since they will have been analyzed in depth and validated by the entire team. More importantly, the projects can be carefully planned in terms of the type and quantity of materials needed given the number of students, the exact moment at which they will be used and any preparation required (for example, the stockkeeper might cut metal rods or sheets of metal into the proper size pieces).

4.3.2 Purchasing and inventory management strategies

As we have just seen, instructional planning is essential in optimizing purchasing and inventory management. Without such planning, the educational institution's stockkeepers must be prepared for any eventuality, as if they were working in a private retail business. They must keep large quantities of stock on hand and be able to acquire the rest quickly and in very small quantities. It is not difficult to imagine the impact of this approach on costs.

A more rational approach to material resources management, based on the appropriate instructional planning, will make it possible to significantly reduce costs and increase the quality of service. Although a detailed look at purchasing and inventory management is beyond the scope of this document, the following are some of the advantages of adopting such an approach:

- The quantities of parts, raw materials, components and accessories needed can be strictly limited to the requirements set out in the specifications for each project.
- Purchases can be planned in accordance with the needs expressed by teachers for the entire school year (depending on the number of students enrolled and the training schedule).
- Purchase orders can be consolidated with a view to paying bulk prices.
- Special or last-minute orders can be reduced or limited with a view to reducing costs (agent, service car, shipping and handling costs).
- Stock and storage space can be significantly reduced, resulting in reduced carrying charges (interest on value of stock), capital costs (storage space and shelving) and costs associated with human resources (handling).
- Materials destined for each student can be prepared, distributed and controlled. Any excess can then be controlled, and clear rules can be established for the distribution of additional materials.

4.3.3 Diversification of funding sources

Many managers in the education sector hesitate to support the development of vocational and technical training on the grounds that it is too expensive. If we compare the cost of general education with that of vocational and technical training, it is obvious that the latter requires more expensive facilities and equipment.

Quality vocational and technical training is expensive, but the absence of a VTT system or a poor-quality system ends up costing society and individuals even more.

Socioeconomic development and a qualified work force go hand in hand, and that is why an effective and efficient vocational and technical training system is essential.

Because of the nature of vocational and technical training and its relationship to goods and services, efficiency can be improved, that is, training and qualification objectives can be met while minimizing costs, through the more open-ended and innovative management of workshop-schools.

A number of countries are exploring management approaches that allow VTT institutions to generate income by selling goods produced during learning activities and services provided by their students.

There are many ways of making training activities self-financing and reducing the net cost of vocational and technical training:

- offering goods and services
- maintaining and renovating the institution's facilities and equipment
- developing workplace training and continuing training

By taking advantage of local partnerships, and within the bounds of accepted competitive practices, a VTT institution can reduce its material resources costs by selling the goods produced by its students during training or by offering services.

Some programs of study are better suited to this type of activity. In the food services sector, for example, students produce meals, pastries, breads and processed meats in large quantities. These products can be sold for profit. The same is true for mechanics and construction trades. It might also be possible to offer services ranging from construction to home renovations, or to operate a garage in order to earn profits and reduce training costs.

Also, students enrolled in the appropriate programs could help maintain equipment or renovate or maintain training facilities. Mechanical manufacturing or electronics students could help maintain or repair the equipment used in other training sectors.

If an educational institution takes this route, however, it is essential that the financing activities contribute to the achievement of program objectives and take into account the order proposed in the instructional flow chart.

Many countries have decentralized continuing training, entrusting it to educational institutions. The production of goods as a direct response to the needs of businesses and individuals provides the institution with an opportunity to generate income. It then becomes a veritable training business, whose commercial activities provide some of its funding.

Obviously, resources can be soundly managed in an educational institution. The optimization of resources, however, requires the coordination of all those concerned, in particular teachers, those responsible for purchasing and storing materials and, of course, students.

SUMMARY

The competency-based approach is not only a program development method; it is a new approach to instructional organization and teaching, as well as physical and material organization.

Thus, vocational and technical training based on the development of competencies associated with semiskilled,

skilled or technical trades is viable only in an environment that resembles the workplace as closely as possible.

Consequently, the implementation of a competency-based program of study requires that the educational institution make a real effort to recreate the conditions under which the trade or occupation is actually practised. Such a situation usually requires the upgrading of facilities (construction or renovation of buildings) and meticulous physical organization, that is, the acquisition and installation of the furniture, equipment and tools needed to carry out the learning activities set out in the program of study, as well as material organization, that is, the acquisition and management of the material resources (raw or perishable materials) needed to manufacture products during the learning activities.

Ideally, the ministry or agency responsible for program development should produce an organization guide or technical specifications for program implementation. Indeed, it is during the program development process that teaching specialists, in conjunction with trade specialists, will be best able to recreate workplace conditions.

Upgrading workshops and maintaining and replacing equipment require a maintenance policy and an annual budget envelope. The challenge is not only to construct and equip a workshop, but also to maintain and replace equipment as needed. Through partnership agreements, suppliers and the business community can loan or donate equipment or raw materials, and thereby help reduce the educational institution's operating expenses.

Moreover, the educational institution should adopt a management approach to reduce costs while adhering to program objectives. Generally speaking, there are two major types of cost-control measures: instructional measures and purchasing and inventory management measures. The institution can also generate income by selling goods produced by the students or offering services.

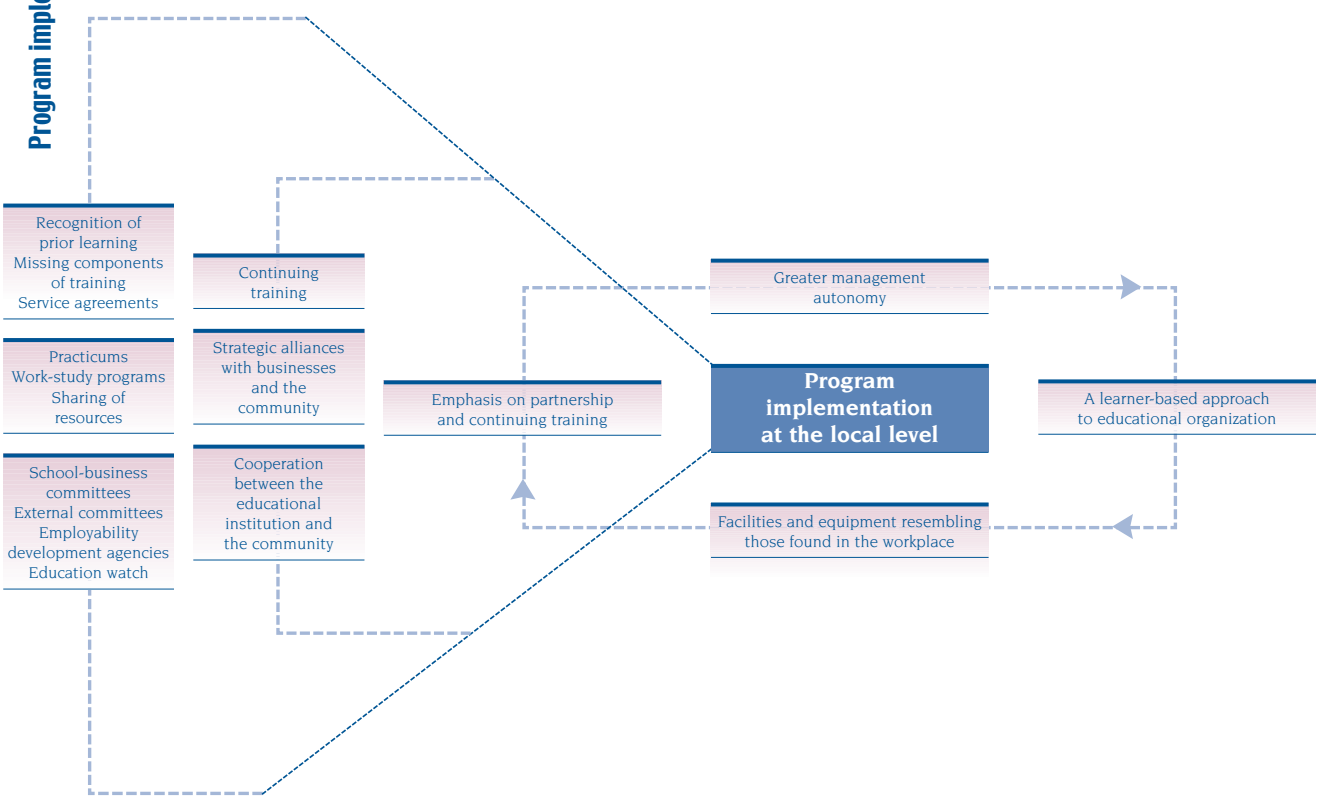
5 Emphasis on partnership and continuing training

To accomplish their mission, VTT institutions must be associated in a general way with the labour market, as part of the market or social economy. They must also have contacts in their immediate environment.

The first aspect was addressed at length in Part 2 of this series on the central management of training, dealing with the centralized elements of vocational and technical training, that is, the aspects that ensure the coherence and quality of a system that meets the needs of the different communities within the framework of the State's overall development policy.

The second aspect, as we have seen throughout Part 4, is essential in order to establish quality program offerings. The relationships between the educational institution and the community will flourish as long as the institution establishes partnerships and alliances with the community, and proposes continuing training activities to help the work force adapt to the rapid technological changes occurring in the workplace.

Figure 6 Emphasis on partnership and continuing training



5.1 Cooperation between the educational institution and the community

Cooperation is based on a consultation process involving educational institutions, businesses[6] and the community. It takes shape in school-business committees, program committees, sectoral committees, external committees that include representatives of the educational institution, or in any other arrangement that promotes the participation of the different stakeholders for purposes of employability development and education watch.

5.1.1 School–business committees

As the name indicates, school-business committees are internal committees whose aim is to ensure that the educational institution's program offerings meet the community's needs in terms of work force training in industry or in the service sector.

Program committees

Program committees play an important role in ensuring program quality. They are generally composed of representatives from the vocational and technical training system and from commercial or community

[6] These may include both commercial and community businesses.

businesses with an interest in a specific program. Their aim is to bring together people with different points of view on a program in order to ensure the correlation of training and employment. For example, an educational institution offering a printing program might set up a program committee made up of teachers, program developers, one or more administrators, representatives of printing companies, and users of such services. Some of the committee members might also want to include representatives of certain social groups.

The different perspectives brought by committee members help ensure excellence by examining:

- the competencies developed in response to market and community needs
- the most appropriate educational strategies
- evaluation methods
- developments in the trade or occupation
- the adjustments needed to maintain consistency between the program and labour market needs

Sectoral committees

Sectoral committees are similar in composition to program committees, but differ in their focus. Rather than focus on a single program, they address all of the programs in a given sector. These committees are made up of practitioners of the different trades and occupations in the sector as well as representatives of various groups, women's groups in particular, in order to ensure that vocational and technical training is offered in as fair a manner as possible.

There may be as many sectoral committees as there are sectors in an educational institution. These committees ensure the quality of training within a sector and evaluate the consistency of the programs with sector needs. Sectoral committees can recommend that programs be revised or withdrawn and that new programs be developed; they can also support the institution's development plan with respect to program implementation. They have the authority to make recommendations to the institution, which must adopt measures to correct any problems raised, if it can, or, if it cannot, notify the agency responsible for vocational and technical training.

5.1.2 External committees

Program and sectoral committees encourage the educational institution and its community to share information and points of view. There are, however, other forums for these types of exchange. Classified here as external committees, they cover a wide range of practices.

By participating in different collaborative events, an educational institution can express its desire to maintain close ties with the community. External committees can come under different ministries or other government agencies. They can be set up by municipal or regional authorities, such as chambers of commerce, chambers of industry or trade councils. They can fall under the jurisdiction of universities, research centres, employer associations, unions or non-governmental organizations such as employability development agencies, which will be discussed in more detail below.

These committees offer representatives from different local or regional socio-economic communities the opportunity to meet and work together to achieve sustainable development in one or more sectors.

Representatives of the educational institution must gather the information needed to ensure that program offerings are consistent with labour market and regional development needs. External committees can also help establish first contact with the community with a view to creating more permanent alliances.

The participation or creation of some of these committees is included in the educational institution's communications plan. It is one of the best ways of guaranteeing relationships between the institution and the economic, social, cultural and political communities.

5.1.3 Employability development agencies

The concept of employability involves the possession by individuals of the competencies required to qualify for one or more jobs. Because employability is most often developed in a program of study, and because the labour market is in a constant state of flux, VTT institutions should work together with employability development agencies to be aware of any changes, positions to be filled, and existing or future trends in the labour market. These agencies can also be valuable allies when it comes to placing VTT graduates.

5.1.4 Education watch

To a certain extent, the aim of cooperation with the community is to ensure that program offerings are consistent with labour market needs, but also to anticipate future needs or possibilities for sustainable development in a given city or region, or throughout the country. To this end, there must be forums for discussion, as described above, as well as mechanisms for examining future prospects, such as education watch. Education watch essentially consists in mobilizing and coordinating education and trade specialists to identify and analyze information about the evolution of a sector in terms of trades, occupations, education systems and work force training throughout the world, in order to come up with realistic forecasts and to encourage innovation.

Keeping abreast of changes, in particular new technologies, is not a strictly individual endeavour. Indeed, the administrations of the different educational institutions must devise strategies to gather information useful in monitoring these changes. The creation of different committees (institution-business committees, sectoral committees or governing boards) is one such strategy that has already been addressed.

Another strategy consists in gathering information from the different partners, through surveys (in which case the education watch is structured and administered by the educational institution), by placing suggestion boxes in strategic locations, or by making voice mail or post office boxes available. In the latter case, information is gathered on an ongoing basis, and the VTT institution's partners can make comments or observations at any time. Depending on the accessibility of information and communications technologies, data can also be gathered using a Web site.

The idea is to encourage as many people as possible to consider the future, keeping informed about the development of

vocational and technical training and benefiting from a wide range of ideas. A committee can process the data gathered on a regular basis, submitting its reports to decision-making bodies or school-business committees.

Indeed, many educational institutions are aware of the importance of participating in their region's socioeconomic activities and of visiting the main employers in their city on a regular basis.

5.2 Strategic alliances with businesses and the community

By definition, an alliance is a partnership formed by mutual agreement. In vocational and technical training, alliances are also based on mutual interest. Businesses and the labour market need a qualified work force, while educational institutions must create an educational environment that resembles the workplace as closely as possible, i.e. workshops, laboratories, equipment and materials that are often very expensive, as well as a real work setting. For this reason, alliances are beneficial for both parties. Alliances can lead to practicums, work-study programs, the sharing of resources and service agreements. Each of these is covered by a special agreement, depending on the educational institution's involvement in the community, and the openness of businesses to forming partnerships.

5.2.1 Practicums

A practicum is a period of training or professional development in the workplace. Its aim is to provide students with the opportunity to practise their chosen trade or occupation in a real work setting. The length of the students' stay in the workplace may vary, depending on whether the aim of the practicum is observation or an introduction to the trade or occupation, like the initial practicums in early childhood education or nursing, or the application of newly acquired competencies.

By hosting practicums,[7] businesses allow students to become familiar with the workplace so that they can determine whether they have made the right career choice (introductory practicums), practise what they have learned in a real production context (practicums focusing on integration), or systematically acquire learning that cannot be acquired at the educational institution because of a lack of means and/or clientele (as in health sector programs) or because of requirements that are particularly difficult to reproduce in an educational setting (as in mining or forestry sector programs).

Practicums are subject to agreements between the educational institution and businesses. First, the date, location, duration and supervision and evaluation mechanisms must be determined. A practicum will be far more successful if it takes place at the proper point in the training process. The location at which the training will take place and the number of trainees that can be accommodated and supervised must be determined in conjunction with the businesses in the region. Often, the educational institution itself will provide practicum positions, but students may sometimes be required

[7] See Part 2 of this series entitled *The Central Management of Training*.

to find their own. Generally speaking, students are not paid for the time they spend in the workplace, although different rules may apply when practicums in the workplace are not included in the official duration of training, as is the case with cooperative education programs. Note that the primary objective of a practicum is training; it is important to ensure that this objective is attained, and that the trainees are not used as a form of cheap labour. Practicums must be regulated, in particular through a process of evaluation carried out by the educational institution, the business, or both.

Practicums are beneficial for both the educational institution and businesses. They provide students with an opportunity to practise their chosen trade or occupation in a real work setting so that they can confirm their career choice and gain a certain amount of motivation to pursue their studies. They can also provide access to a physical environment unavailable at the educational institution. Practicums provide businesses with an opportunity to participate in training in order to ensure that it meets their needs. They are also a good way to recruit new employees, since employers can observe and evaluate men and women who will soon be looking for jobs, before hiring them.

5.2.2 Work-study programs

The work-study approach is an educational strategy that consists in alternating work terms and periods of study. In vocational and technical training, it is a means of organizing training that allows students to acquire competencies in the classroom and on the job.

The success of a work-study approach is based on a well-defined partnership between a business and an educational institution, each one playing a complementary role in an effort to produce a qualified work force. The approach is an *educational strategy* involving a *cooperative plan* of activities carried out in the educational institution and the business, which *collaborate* closely on the design and implementation of the training process. It requires a coherent and logical arrangement of periods in the educational institution and in the workplace, the learning activities carried out in each place being integrated into the training process. All the learning acquired in one place is applied in the other.

The work-study approach involves considerable challenges and difficulties in terms of its implementation. It is not merely a matter of using facilities made available by the business. In order to obtain the expected results, the educational institution and the business must demonstrate a desire to help train as qualified a work force as possible. This requires adapting the training process, and establishing a true partnership where the educational institution and the workplace complement one another and each one is assigned a specific role. The organizational structure of the business must be capable of hosting, training and evaluating student trainees. It must have the necessary qualified supervisory staff who are willing to receive pedagogical training. It must also have the necessary technical organization and production capacity to cover an adequate range of tasks required to attain the training objectives. Finally, the business and all of its members (executive,

management, employees and unions) must clearly demonstrate that they want to contribute to students' training despite the inevitable difficulties.

The work-study approach is therefore another way of providing training. Work-study vocational and technical training programs are generally well received, since they allow students to acquire the necessary competencies by attaining the related objectives in the workplace. They also allow students to transfer previously acquired competencies to an actual work setting, and to integrate gradually into the labour market by using the workplace to consolidate and enhance the competencies acquired in the educational institution.

Work-study programs are even more dependent on partnerships between educational institutions and businesses than are practicums. Based on the clear definition of each partner's role, the programs involve shared responsibilities depending on the goal of the proposed training plan. The time and duration of the alternating periods must be logical: each establishment must benefit from the learning acquired by the students in the other. Support, supervision and evaluation are shared by the partners with a view to helping the students acquire competencies. Periods of training in the workplace can vary from one program to another and depending on the sociopolitical and economic context of the country in question, although it usually represents between 25% and 40% of the overall duration of training. Since vocational and technical training programs lead to diplomas issued by the State or by the educational institution, it is not difficult to understand why work-study programs usually begin and end at the educational institution. The business can participate in the evaluation of learning, but certification remains the responsibility of the State or the educational institution.

Despite the difficulties inherent in their implementation, work-study programs can have appreciable benefits:

- training closely associated with real work settings
- greater motivation of learners, who are better able to understand the relationships between theory and practice and can sometimes be paid for their time in the workplace
- the sharing of the educational institution's physical and material organization costs and the business's work force training and professional development costs
- the sharing of human resources assigned to training
- the continuous upgrading of both partners' staff
- a better understanding of program offerings on the part of businesses

While educational institutions can easily see the benefits of collaborating with businesses, the reverse is not necessarily true, especially if the vocational and technical training system has not been revised in a while, the programs of study are obsolete or have not kept up with labour market developments, and there is no history of cooperation between the educational institution and the community. Depending on the sector of activity, businesses might consider the expense unjustified and the advantages difficult to see. In this case, depending on the available resources, the State may offer

incentives to business partners in the form of tax credits or other fiscal measures, or promotion and support mechanisms.

5.2.3 Sharing of resources

Partnerships between educational institutions and businesses involve the sharing of physical, material and human resources to different extents. For example, a business might provide students with access to a workshop that is not available in the educational institution. In return, the institution provides the business with financial support by contributing to the purchase of equipment, which the business agrees to maintain or replace as needed.

Human resources are shared on a relatively frequent basis—the educational institution might have personnel whose expertise is required by the business, or the business might provide the educational institution with access to specialists that they could not recruit on a regular basis. This is especially true for teachers and trade specialists, whose competencies are often complementary in vocational and technical training.

5.3 Continuing training

Continuing training is any training activity aimed at the acquisition, development or upgrading of the knowledge and skills needed to ensure occupational or personal development. It is part of the current philosophy of lifelong learning, and most people associate it with adult education. In vocational and technical training, continuing training involves the development and maintenance of competencies associated with a trade or occupation. The following paragraphs will deal exclusively with this type of activity.

Continuing vocational and technical training can be organized in different ways, ranging from the total segregation of young people and adults, to their total integration.

In the first case, the two vocational and technical training systems, one for young people and the other for adults, exist side by side. When adults require continuing training, they are offered upgrading activities and transition programs. These activities are organized in specific programs or paths designed on the basis of adults' needs and characteristics. Adults may receive training in institutions devoted exclusively to adult education, or in the same ones frequented by young people but at different times.

In the second case, young people and adults can be offered the same programs, carrying out the same activities at the same time, in the same institutions and with the same teachers. In this case, young people and adults are both treated as adults and evaluated on the basis of the competencies they have acquired. This type of organization optimizes the use of physical, material and human resources. There is only one vocational and technical training system, subject to integrated management. Competency-based programs are conducive to this type of organization, since they are not designed on the basis of learners' characteristics, but those of the trades and occupations.

Nevertheless, adults are adults. They have more life experience than young people; they may have families and therefore need special schedules. They also have more work experience. Their life and work experience have allowed them to acquire competencies. Although they may

need to upgrade these competencies or acquire new ones because theirs have become obsolete or because it is now impossible to find a job, they require a special educational approach, since they already have competencies. They don't want to relearn what they already know. That is why it is necessary to determine what they know and what they need to learn, hence the recognition of prior learning and the identification of missing components of training.

5.3.1 Recognition of prior learning

The recognition of prior learning is a means of evaluating and officially recognizing what a person knows or knows how to do, regardless of where, when or how he or she acquired the learning. The subject of recognition is not the number of years of experience, but what has been learned as a result of the person's life or work experience. Of course, this definition favours adults, since they have had the time to acquire a number of competencies.

Today, the terms "recognition of prior learning" and "validation of competencies" are both used. The first term is more specific to education, while the other is used in the labour market. The first is aimed at recognizing what people have learned so that they do not have to undergo training that will add nothing to what they already know. The validation of competencies is aimed at recognizing what people already know so that they can get a promotion or a new job or practise a new trade. In education, the objective is a shorter path toward official certification in the form of a diploma enabling the person to enter a new workplace, keep his or her current job or get a better job. In the workplace, the objective is to favour and facilitate job mobility. Both concepts focus on employability, which is why the terms are more or less synonymous in vocational and technical training. Learning acquired in an educational setting is expressed as competencies in order to ensure consistency with the workplace.

By having his or her prior learning recognized, a person can:

- obtain better qualifications in the labour market
- improve his or her chances of getting a job or a promotion
- make up a list of his or her competencies
- obtain a diploma without having to relearn what he or she already knows
- specify his or her training or professional development needs

The recognition of prior learning, however, is not an easy process. Educational institutions use three different methods: tests, recommendations of equivalence or substitution of credits, and individual evaluation or a list of competencies drawn up by the candidate. There are different types of tests to validate the competencies acquired. They may focus on specific knowledge or the performance of a task according to specific instructions and within a set time limit. Recommendations of equivalence or substitution are based on the analysis of the candidates' training and work experience. Individual evaluation is increasingly dependent on candidates' production of a portfolio of their competencies. These techniques all use evaluation to validate prior learning. The goal is to allow candidates to avoid having to undergo training to acquire competencies they already have.

5.3.2 Missing components of training

The recognition of prior learning can shorten or modify the time it takes to complete a given program according to the learner's needs, so that he or she does only those learning activities needed to obtain a diploma. That is the basis of the concept of missing components of training.

It can be easy to determine what a candidate needs to learn, for example, in the case of upgrading or professional development related to an existing program of study. It is then simply a matter of determining which competencies have not been mastered and enrolling the candidate in the appropriate activities.

The process can also be more difficult, for example, for candidates who have been working for a long time or who are homemakers. Such candidates require more serious reorientation. The difficulty in this case is to identify the competencies acquired in order to determine the missing components of training.

Instructional engineering specialists must then develop training activities designed to meet continuing training and business development needs outside a particular program. Both of these dimensions are addressed in greater detail below.

5.3.3 Service agreements

The sharing of resources (see section 5.2.3) naturally leads to service agreements, particularly with businesses, which are now called upon to adapt to new situations, the globalization of markets and economic fluctuations. Educational institutions can contribute to business development by offering work force continuing training and professional development activities in the different sectors of activity.

Partnerships between the education, business and social communities can allow VTT institutions to participate actively in their region's socioeconomic growth by providing for and supporting the technological and organizational development of businesses. To this end, educational institutions can share their skills, knowledge and experience, thereby forming a strong, versatile network serving individuals, businesses and organizations, not only in a given region, but also throughout the country.

The services offered by VTT institutions will depend on the needs expressed. They might include:

- identifying and analyzing training needs in a given community or business
- developing training programs to meet specific needs
- organizing, evaluating and following up training activities
- developing instructional materials
- evaluating prior learning and establishing a portfolio
- providing instructional support
- making organizational diagnoses
- analyzing the job situation
- measuring performance

Of course, these services are valid for both initial and continuing training. They can be offered to any type of business of any size, to groups of businesses and public and parapublic agencies, or to national and international businesses.

Offering these services can help VTT institutions monitor the needs of the community, which itself benefits from:

- recognized certification with an official attestation awarded by the State or the educational institution

- quality resources in the qualified staff of VTT institutions
- a profitable investment, as long as the State has taken the necessary legislative and economic measures
- flexible services adapted to the community's specific culture, needs and requirements, thus contributing to the development of work force competencies

SUMMARY

A VTT institution cannot accomplish its mission unless it forges ties with the community that surrounds it. These ties involve partnerships, collaborations and alliances with the community, based on common and shared interests. Both the commercial and the social economies need a qualified work force that can evolve with economic, social and cultural changes.

This is the context in which relationships are established between initial training, continuing training and the social and economic development of a municipality or region. Indeed, local and regional development, as well as continuing training needs, are the driving force behind initial training, ensuring its relevance via multiple contacts between the educational institution and the community. The institution can request the participation of community members in school-business committees, to ensure that specific programs or all the programs in a given sector correspond to labour market needs. It can also ensure institutional representation on external committees set up by municipal, regional or ministry authorities, chambers of commerce or industry, trade councils, universities, research centres, employer associations, unions or non-governmental organizations such as employability development agencies.

By participating in different collaborative events, an educational institution can express its desire to be part of the economic and social fabric of the community and to play an active role in its development. The quality of these ties helps forge alliances requiring a more sustained commitment in the form of practicums, work-study programs and the sharing of physical, material and human resources, so important in vocational and technical training.

These exchanges between the educational institution and the community naturally lead to continuing training, which is intended both for adults in the region who need training in order to find a job and for people who already have jobs. In one case, the training is intended for unemployed people who would like to enter or reenter the job market, perhaps in a new sector. In the other, the training aims at upgrading, retraining or developing new competencies; it is therefore intended for people who already have jobs, and for businesses.

To take adults' needs into account, a system that recognizes prior learning and identifies missing components of training will ensure that adults do not have to relearn what they already know.

CONCLUSION

All of the efforts made by the different players in the reform of a vocational and technical training system culminate in the implementation of VTT in educational institutions. These players are representatives of different communities, such as the political or administrative community (ministries and State agencies) and the socioeconomic community, in particular the labour market.

The implementation of competency-based programs requires a basic change of perspective from more traditional teaching, in terms of both pedagogy and the organization of equipment and facilities. It requires the support of all players and a great capacity for adaptation. Teachers are required to change their traditional role based on the transmission of knowledge and to place the student at the centre of a process favouring the integration of knowledge, skills and attitudes in a renewed instructional approach.

Making equipment and facilities similar to those in the workplace available to students and teachers, supporting students in their progress, identifying problems that could affect success, developing strategies to favour the integration of graduates into the labour market, forging ties between the educational institution and the community, establishing partnerships and collaborative networks, and implementing continuing training and business services are all challenges to be met by the entire staff of the educational institution.

Expectations are high and could not be met without the implementation of adequate human, physical, material and financial resources.

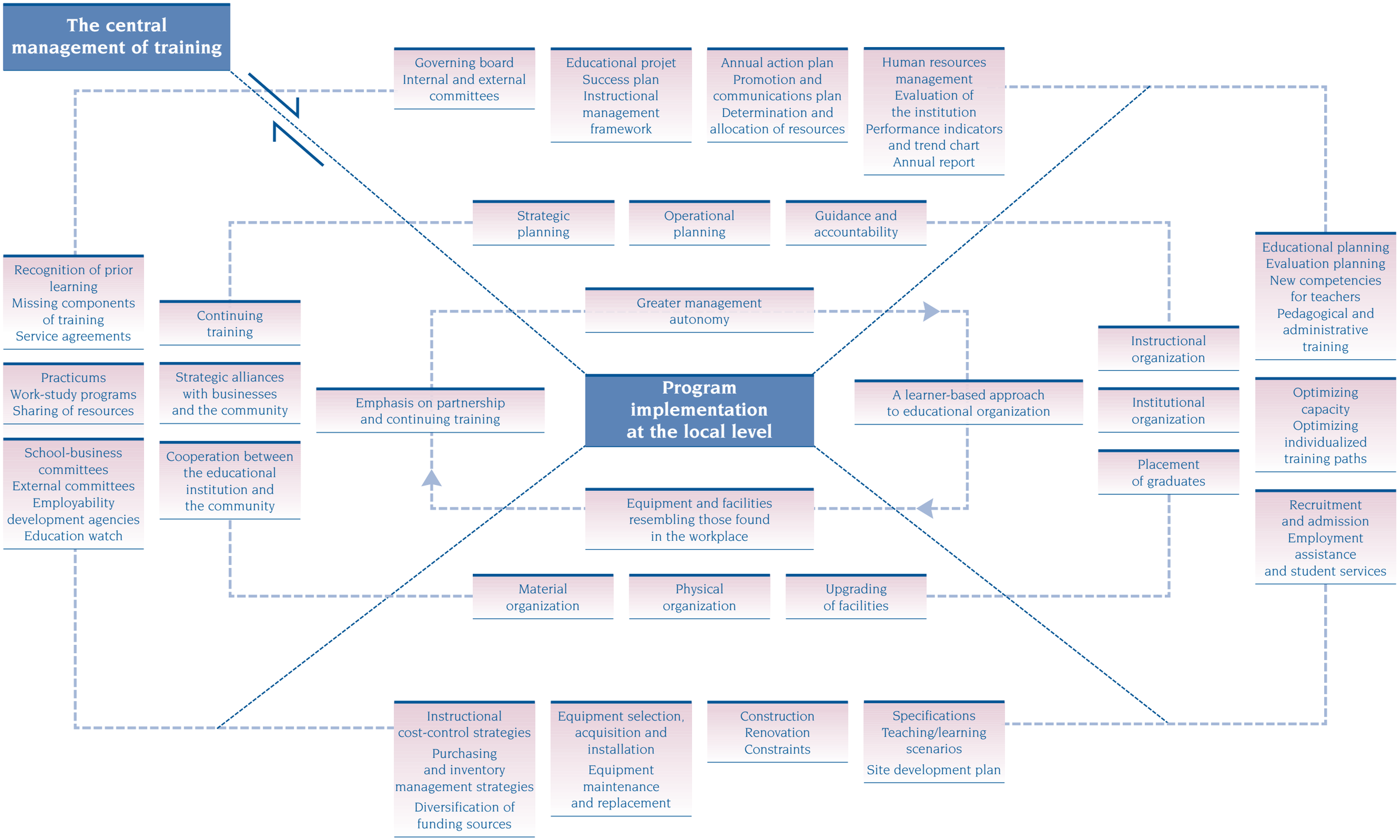
The approach to managing educational institutions must be reviewed. There is a growing tendency toward the decentralization of powers and the greater autonomy of managers of educational institutions.

The creation of a board of governors will help the educational institution establish priorities, manage resources and report its results, while facilitating local management and strengthening its ties with the community. With greater autonomy and mechanisms for more effective ties and coordination with its main local partners, the educational institution is in a better position to assume its main vocational and technical training responsibilities and to develop complementary services in terms of continuing training or business services. In such a context, the conditions for true management by results are present.

Please note that this document is one of a series of four, including *Government Orientations, Policies and Structures*; *The Central Management of Training* and *Program Development*.

APPENDIX

Reference card



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