

Technical Secondary Schools: Their Contribution to Job Training for Poor Sectors¹

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Abstract:

A report is given of the results of research on technical secondary schools. The study's objective is to address the meaning and function of job training in technical secondary schools, and in particular, the importance of such training for young people from poor economic sectors. The project is based on ten case studies at secondary schools in five of the nation's states. The results show the precarious situation, low positioning and neglect of technology leading to doubts regarding the degree to which technical secondary schools currently provide job training. Nonetheless, based on the replacement of some practices, the conclusions point to the importance of technical secondary schools in impoverished urban and rural contexts, where such schools can respond to the problems of young people from vulnerable sectors. A case is made for supporting this type of schools and providing them with the necessary attention.

Key words: secondary education, technical education, job training, young people, poverty, Mexico.

Introduction

Technical secondary schools (ST) are one of the three main types of basic education in Mexico. They were created in the late 1970s and now serve close to 30% of all secondary school enrollment. They are unique as a bivalent educational option that offers added value within the curriculum: students follow the regular secondary program while training in a technological area. They graduate with a secondary school certificate and a diploma as an assistant technician in a determined specialty.

Taking into account that technical secondary schools have existed for more than thirty years, and considering the unequal development that continues to characterize Mexico and the accelerated dynamics of recent technological progress, the current importance of such schools merits study: To what degree do they meet the needs of training for employment? What is their importance for young people from disadvantaged sectors, and for those who will not advance beyond secondary school? These questions were addressed in the research project, "Evaluación diagnóstica de las secundarias técnicas como opción en el nivel de la educación básica" ("Diagnostic Evaluation of Technical Secondary Schools as an Option in Basic Education").²

This research project was completed during the first half of 2003. The priority of the analysis was to focus on job training and its place in the curriculum. The results presented here may be of importance in the current debate on the integral reform of secondary education, in weighing strategies for including technological culture in the curriculum of basic education.

This article is divided into four sections. The first presents the context of the current discussion on the presence of job training in the curriculum of basic education. The second offers the fundamental sections of the research project (objectives, bases, research questions, methodology). The third section points to the study's results, and to settings that were a priority during the analysis. And the final section concludes by indicating the implications of current policy for basic education.

Technical Secondary Schools and Job Training

Secondary education has particular importance in the formal educational system. Its enrollment has increased notably in recent years, partly due to emphasis on broadening the coverage of primary school and the consequent increased demand for secondary school education: an increase of 175% from 1970 to 1980 (Santos, 1996). Between 1990 and 2003, coverage increased from 67.1% to 85.9% (INEE, 2004). At the same time, the inclusion of secondary school in mandatory basic education in 1993, has led to efforts to strengthen and broaden its coverage (which grew from 68% to 86% during the past decade). Secondary school, however, still presents problems in terms of coverage, failure indexes (18.6%) and dropping out (6.8%). Added to these problems are the low quality of secondary education (inadequate curricula, low teacher profile, high personnel turnover, marginal infrastructure, lack of evaluation, over population, etc.) and its indefinite mission in terms of educational proposes (Sandoval, 1994).

The importance of secondary schools is emphasized by the demands of globalization, rapid technological change and the growing interdependence of markets; thus the importance of having a flexible, creative workforce, with solid knowledge of mathematics, language and communications (Wolf and De Moura Castro, 2000). Secondary school is a key space for reinforcing basic skills and acquiring the common culture that promotes citizenship; at the same time, secondary school contributes to discovering through experience and being in contact with topics like health, science and technology. Secondary school marks the acquisition of important life skills such as teamwork, interaction, problem solving, and adaptability. Its goal is to prepare students for their transition to the world of work. Thus, three important functions are filled: preparing students for higher education, forming good citizens and offering training for those whose education will not go beyond secondary school (Sandoval, 1994; Wolf and De Moura Castro, 2000). This final function has particular importance in supporting the study, as well as in analyzing the results.

Technical secondary schools represent an interesting option in Mexico because they are part of the basic level and offer job training through a variety of workshops (most commonly industrial drafting, electronics, computers, garment industry, electricity, and secretarial work). The workshops form part of the curriculum and are aimed at teaching young people the basic skills in different specialties and trades. Thus the importance of technical secondary schools can derive from: *a*) providing basic technical skills to those who will very probably work in those areas (self-employed, informal sector, or entry level positions in the formal market), and *b*) contributing elements that allow students to define their vocational possibilities. To what degree do technical secondary schools fulfill these functions?

It should be pointed out that no specific studies have been carried out in Mexico on technical secondary schools, although some proposals have addressed the topic of secondary schools' links with work, particularly in rural areas and in terms of community development (Ruiz, 1996; Rosas, 1985). Studies like those of Gómez *et al.* (1993) have focused on the social and occupational value of technical secondary schools, and other studies (Gómez y McGinn, 1981; Wolf and De Moura Castro, 2000; De Ibarrola y Gallart, 1994) have analyzed the problems and challenges of secondary education in Latin America; however, such studies are commonly centered on high school education and refer to secondary schools by comparing them with high schools. No studies are centered on technical secondary schools as part of the basic cycle.

The existence of a vocational option at the basic level, which incorporates elements of job training within its curriculum, responds to the importance of such training. On one hand, particular emphasis has been placed on promoting technological culture in the

broad sense; i.e., culture that is oriented to the role of technology in history, the current function of technology, its importance in economic and social relations, and the solving of technical problems. On the other hand, job training at the secondary level has been considered worthwhile because a large portion of the population does not attend school beyond the secondary level (only 50% of the age group continues on to high school) and the curriculum must provide useful skills for immediate employment. To what degree does (or can) technical secondary schools contribute elements for dealing with this incorporation more successfully? Specifically, 5.5 million young people from ages 13 to 17 (54% of the total) are outside of the educational system (Muñoz Izquierdo, 2000). What are they doing? If many of them are already participating in the formal or informal employment market, did technical secondary schools make a contribution to their entry into the workforce?

Questions

Some of the questioning directed at technical education has referred to the high cost of this type of education, the lack of teacher preparation, the obsolescence of the technical skills taught, the marginal infrastructure of workshops and the lack of links with the workplace (Gómez y McGinn, 1981; Wolf and De Moura Castro, 2000). Discussion has also centered on the usefulness of incorporating components of job training in the curriculum of formal education. Some opinions state that specific preparation for work (such as the workshops in technical secondary schools) should not be part of formal education, but should be offered through informal and private training programs (Wolf and De Moura Castro, 2000). Such an opinion would question the inclusion of workshops in the curriculum of technical secondary school and the appropriateness of this type of school at the basic level. On the other hand, if the work component of the technical secondary school curriculum is marginal and of low quality, questions should focus on the usefulness and function of such schools; such questions are part of this research.

Other questioning regards the timing of teaching trades. Technical secondary schools suggest particular considerations since various work skills are presented at a very early age (between 12 and 15). Questions address the meaning and use of job training for this age group and educational level. For students who continue their studies after secondary school, what is the importance of the job training component? For young people who enter the workforce, to what degree are the acquired skills useful in their future jobs and careers? Most certainly, the curriculum of technical secondary schools leads to questions concerning the possible alternatives offered by more solid, pertinent training in technical skills; in other words, the possibility of going beyond training in technical skills, in the interest of compensating for deficiencies, and training for employment and self-employment.

Given such considerations, the research was based on the working hypothesis that technical secondary schools are an important educational option for responding to the training needs of students from disadvantaged sectors. Still prevalent in such sectors are social and economic contexts (unfortunately not very different from those of thirty years ago) that justify the permanence of technical secondary schools. The hypothesis addresses the following three considerations:

- 1) For young people who do not want to continue, or cannot continue, on to high school, technical secondary school is a beneficial option that allows them to obtain a diploma while acquiring basic work and technical skills to face their future job setting.

- 2) There are technological specialties that respond to the needs of marginal urban and rural groups, and that would facilitate young people's entry into the productive activities of these contexts.
- 3) The importance of links between technical secondary schools and the development of rural communities, based on the technological specialties of each school.

Research

In general terms, the research sought to contribute elements that would permit addressing the meaning and function of job training in technical secondary schools.³ In other words, the study attempted, on one hand, to understand the intended purposes of job training, the way job training is practiced and perceived, and its positioning at each school; and on the other hand, to analyze the aims of technical secondary schools in the eyes of the young people who select it, the schools' particular relevance for students from disadvantaged sectors, and the viability and usefulness of technical secondary schools in meeting the needs of marginal urban and rural areas.

Methodology

The research methodology involved the completion of case studies in a group of ten technical secondary schools selected for this purpose. According to the nature and intentions of this type of methodology, the studies were aimed at obtaining a general understanding of some settings of importance in technical secondary schools. Observation and analysis were centered fundamentally on institutional and curriculum traits that would explain the components of the supply of technological education. In contrast with quantitative studies, the interest of this research was to obtain an interpretative and comprehensive vision of the current situation of technical secondary schools. We believe that this focus can provide a more complete understanding of technical secondary schools and elements for establishing policies.

The study put special emphasis on obtaining information on the perceptions of individuals who intervene at the different levels of the academic organizational chart. The interest of research was to comprehend school dynamics, the setting for teachers, the perception of job training in technical secondary schools, and in particular, the positioning of the technological component in the curriculum and in school dynamics. The principal instrument for collecting information was the interview, as well as observation and the consultation of institutional documents.

Each school was visited for a time period of three to four days. During the stay, interviews were completed with the school's director, assistant director, coordinators (academic, technological and complementary services), teachers in technological areas and teachers of some general subjects (preferably Spanish and mathematics, to correspond to the importance of basic skills). Group interviews were held with third-year students in each technological area, by randomly selecting six students (three girls and three boys) from each third-year group. To validate the information, the data obtained from students, directors and teachers were analyzed through use of the triangulation technique.

Selection of Schools

The schools considered in the study were the result of an intentional selection of cases considered important for comparison and contrast in the proposed analysis. Based on the hypothesis that technical secondary schools are an educational option with potential for responding to the training needs of disadvantaged sectors, there was

special interest in defining the schools' performance in such sectors. Emphasis was placed on schools located in poor areas, particularly in order to analyze the relevance of technical secondary schools in rural contexts, and the possible link between technological activities and the rural population.

Some schools in semi-urban areas were included (Topilejo and Pedro Escobedo) to permit the analysis of the importance and meaning of non-agricultural workshops (secretarial skills, carpentry, computers) in the school curriculum. An urban school was selected (Carrillo Puerto) for contrast with the agricultural schools.

Other schools included were two schools in Chiapas and two tele-secondary schools in zone 016 in Puebla. The schools in Chiapas were selected as part of the project, "Las escuelas secundarias técnicas de Chiapas en el siglo XXI" ("The Technical Secondary Schools of Chiapas in the 21st Century");⁴ and the tele-secondary schools were selected to contrast and analyze the particular form of operating the job training component.

Thus ten schools in five states were included, distributed as follows: Federal District (Mixquic, ST (technical secondary school) number 34; and Topilejo, ST number 56); Tlaxcala (Nativitas, ST number 3; and Temezontla, ST number 22); Querétaro (Pedro Escobedo, ST number 4; and Carrillo Puerto, ST number 6); Chiapas (Oxchuc, ST number 31; and Altamirano, ST number 36); Puebla (two "tele-secondary schools linked to the community": Tepexoxuca and Oyametepec). The technological areas considered in the research varied by the schools' specialty and location (agricultural and industrial), and included workshops on agriculture, livestock, good conservation and industrialization, beekeeping, computers, secretarial skills, electricity, iron working and carpentry. In the case of the "tele-secondary schools linked to the community", consideration was given to the micro-operations of a bakery and recycled paper.

Considerations of Research Results

This section emphasizes elements considered relevant in the analysis and included in the study because of their relationship to the technological areas. These elements are: the context, the job training component, school management, teachers, student perceptions, the characterization of space and links with the community. Some of the statements regarding these elements have a conclusive nature based on the study's results, and others are proposals or recommendations at the level of educational policy.

Job Training

"The current panorama of technical secondary schools... is no longer that of times past."

Technical secondary schools now face a context that is very different from past decades. At least four factors distinguish their present and past:

- 1) Although technical secondary schools were previously an alternative option to general secondary school, they now face the competition of other schools, whether general, tele-secondary schools or new technical secondary schools.
- 2) Although technical secondary schools were often the final educational level for young people lacking in economic resources and local options for continuing their studies (which justified the schools' job training component), high schools are now available (general as well as technical high schools).

- 3) Technological development has questioned the nature and possibilities of technical secondary schools in terms of their suitability and ability to offer technological culture and job training.
- 4) Technical secondary schools do not receive the support of previous years, and the subsistence levels of many disclose the current marginality of technological training. In fact, technical secondary schools that were founded twenty years ago in many parts of the nation are now marked by the inertia of a lack of resources, obsolete technologies, abandoned workshops, idle machinery, deficient teacher training programs, the absence of collectives to participate in academic strategies, and vacuums of leadership and new management styles.

It should be asked, therefore, if technical secondary schools are offering students the knowledge and techniques of technological activity that will allow them to find employment immediately (as established by Article 3, Fraction 2 of SEP agreement number 97, in reference to the organization and functioning of technical secondary schools). Although certain schools do fulfill the mission of educating students in accordance with such a profile, the attainment cannot be easily generalized throughout the entire system of technical secondary schools.

Should technical secondary schools be oriented to technical specialization (aimed at training apprentices in various trades) or offering the general bases of a technological culture? Since 1995, the emphasis of technical secondary schools (different from general secondary schools) has been to offer basic technological training that adheres to the ruling to reduce the time allotted to technological areas to only three hours (based on the reforms of 1993). Many schools have already complied with this ruling, especially in urban areas. In such schools, the curriculum of technical secondary schools is hardly different from that of general secondary schools, except for the inclusion and promotion of technological culture as added value. It should be asked, however, if technical secondary schools have provided training in technological culture, understood to be a new basic culture that has to do with: *a)* the identification and solution of problems related to available resources; *b)* the inclusion of the practical dimension of the knowledge obtained; *c)* the understanding and adaptation of technological changes. Are these goals reached or do they remain as discourse?

Many technical secondary schools, in addition to having the mission of training in technological culture, continue to offer training in different specialties. However, the low positioning of technological areas and the conditions under which they operate lead to questions regarding the degree to which these workshops really contribute to job training. Thus, is it truly meaningful to conserve technical secondary schools as a separate option, out of respect for their history as an institution and their possibilities?

The Extremes: from Abandonment to Commitment

The degree that technologies are the core of the curriculum varies in each school, and is directly related to the existence of collectives (teams of teachers), school management and the academic setting. On one hand, some experiences reveal a dimensioning of the technological areas within the curriculum, which corresponds to leadership at different levels and with the development of groups interested in strengthening these areas (for example, the 21st Century project in the state of Chiapas and the Topilejo school in the Federal District⁵). These experiences have been characterized by the use of cooperatives, by technical and pedagogical support for teachers, and by technological updating.

On the other hand, in certain situations, the low positioning of the technological areas converts them into simply one subject more in the plan of studies. In such cases, their marginal location in the educational model, i.e., their weight in the curriculum and academic life of the school, is evident in the reduction of the class hours of teachers in the technological areas, in the precarious infrastructure of workshops, the near absence of production projects, the lack of personnel dedication and commitment, the lack of innovative and alternative technological aspects, and the limited relation with academic materials. An example is observed in the weak situation that prevails in agricultural technical secondary schools, due to the highly marginal conditions under which they operate.

On the Particular Relevance of Technical Secondary Schools in the Rural Setting

The greatest questioning of the teaching of technological areas in technical secondary school involves the low quality of job training provided, rather than the importance of the continued existence of technical secondary schools. This factor is of particular importance in the rural setting, where the knowledge acquired in workshops can offer skills linked to context, especially in the agricultural area. In these spaces, it is important to emphasize the need for workshops to relate to the productive possibilities of contexts, as well as their contribution to the development of new practices for rural producers. Some workshops (like the agricultural workshop in the technical secondary school of Altamirano) offer important lessons on the possibilities of having committed, qualified teachers who are linked to the community and interested in supporting agriculture as well as generating innovative alternatives to respond better to community needs. An example is the comment made by the agriculture teacher at the school in Altamirano, Chiapas:

At my school, which is school no. 36 of Altamiranoa– concentration of poor peoplea– technical secondary school makes sense and is very important. For example, I teach agriculture: the first year is gardens, the second is basic crops, and the third year is growing mushrooms. It is a training school for students because not all continue their schooling, due to their situations. It is a fundamental and basic secondary since they can enter CBETA, a university. Very few students reach those levels. But other students, because of our country's poverty and economic crisis, use practically everything they learn to meet their needs in daily life. What they learn in secondary school they take to their communities as technology, as a technological innovation to be taught in their communities.

Some school experiences and practices show that the educational model of technical secondary schools is viable and pertinent in rural contexts and in marginal urban zones. Some of the factors that support this affirmation are the following:

- Technical secondary schools can provide relevant technical skills for students unable to continue their studies and forced to enter the labor market. In this sense, although the current operating conditions of technical secondary schools are an obstacle to high-quality job training, some school workshops have been able to offer students basic technical skills in certain specialties (the food conservation workshop in Mixquic and Altamirano, and the agricultural workshop in Altamirano).
- Agricultural technologies can represent important options in these contexts; the technical secondary schools in Altamirano and Topilejo offer important lessons

on the potential of these areas when they enjoy the necessary support and institutional willingness.

- The technological areas of technical secondary schools create significant possibilities of linking to community needs and contributing to community development. Once again, the experiences of community contact of the Topilejo and Altamirano schools are an example of the potential of technical secondary schools in such contexts.

In marginal urban and rural contexts, technical secondary schools are obligated to revise technological viewpoints through the following:

- By analyzing the relevance and usefulness of continuing the livestock workshop. Although the workshop deserves consideration in some contexts, the situation is problematic in some schools: the restriction to small species because of the high cost of animals and maintenance, technological backwardness, lack of student interest, etc..
- By reconsidering the specialties of the “basic workshop”, which continues to be relevant since it teaches technical skills that young people can use in their future employment; it also responds to the needs of many marginal contexts. As one teacher pointed out, “The basic workshop offered the opportunity to train them in machines, tools, agricultural equipment, carpentry, welding, carpentry..., so that students were prepared for life [...] If they could not further their education, they could open a workshop a earn enough to help their families.” If these workshops have the necessary support and resources, the possibilities of influencing the training of students in useful skills could be significant.
- By supplementing the technological curriculum with other areas that may be relevant for students who wish to migrate, continue on to vocational high school, or simply enter areas other than agriculture. It would be important to include other specialties, like computer science, drafting or graphic design.
- By offering students the possibility of rotating through different workshops, in order to expand their secondary school learning; they would select the technological area that best responds to their interests.

School Buildings

Schools buildings have fundamental importance in daily perception and experience. Their nature and characteristics affect the perceptions of students, teachers and directors. Young people view their school as their place of study and socialization; for teachers, the school is their place of work and interaction.

The arrangement of space varies among schools, yet a common trait is the neglect of areas designated to technology, and the resulting undervalued image of these areas. Lack of attention, abandoned workshops, the lack of materials and tools, waste, and the lack of furniture and equipment are common in these schools. The following teacher comment is not unfounded: “Those of us in the technological areas are looked down upon because they say we do not have adequate training.., they feel we know nothing about teaching; they believe we do not know how to plan.”

In some schools, neglect extends to the physical installations, with broken windows, filthy bathrooms without water, trash in the patios, unkempt classrooms with old blackboards and broken chairs. Students’ opinions regarding the building space were particularly critical. Although they may come to accept the space they are forced to use for three years, their perceptions of school are affected by their impressions of the

building. The opposite case is the satisfaction shown by young people who are able to use clean, neat areas with sufficient materials, and the contrasting final perception they have of their secondary school experience.

Teachers

Teacher Training (Didactic Support and Strategies)

Teachers are a fundamental component of school dynamics since they are most responsible for the quality of the educational supply. It is therefore important for them to have training options that allow them to update and develop their skills to improve the teaching/learning process. The teachers in the technological areas commonly proved to have technical profiles (agronomists, livestock technicians, carpenters, etc.) that correspond in general to the workshops they manage; they were found lacking, however, in the necessary pedagogical elements. In other words, not having attended teacher college or normal school generates difficulties in the teaching/learning processes. The following considerations involve teacher training at technical secondary schools:

- The courses offered are judged to be a useless requirement. The teachers' responses reveal the conviction that the courses offered are not serialized and do not respond to the problems and weaknesses faced in the classroom: "The training courses leave a lot to be desired; they are normally very repetitive. It's always the same thing, with nothing new for me to learn" (history teacher).
- Emphasis is placed on the importance of carrying out training activities based on the school's problems, in order to meet the need for more didactic and pedagogical tools. Such problems include: a) personnel seniority and the lack of updating, or the adherence to traditional teaching techniques; and b) the lack of normal school graduates among the teachers of the technological areas, and the lack of pedagogical preparation.
- The teachers of technological areas face particular problems due to the lack of specific training programs. They cannot all be incorporated into teacher training because many cannot meet the educational requirements. Many teachers do not even have regional meetings (like the welding workshop in Querétaro) or training options that allow them to update their technical knowledge.
- Academic coordinators do little to promote training programs in response to the particular problems of each school. There are no diagnoses and evaluation of teaching strategies or teachers' training needs. The technical secondary school of Topilejo attracts particular attention (as well as the "tele-secondary schools linked to the community") because of school strategies that attempt to respond to teaching problems.
- Bilingual and intercultural training is a priority for schools located in indigenous zones. The absence of collective strategies that permit dealing with the characteristic reality of many of these schools (the case of Oxchuc and Altamirano, in Chiapas) has serious negative implications for the adequate development of the educational process.
- Links with other training organizations are indispensable to broaden horizons and to respond to the particular training needs of each schools. An example has been the training offered to teachers of Oxchuc and Altamirano by Casa de la Ciencia (nongovernmental organization that trains teachers in Chiapas).

Work Teams and Teacher Dynamics

The absence of work teams among teachers was a repeated observation during visits to schools, except in the case of the “tele-secondary schools linked to the community”, the Topilejo school, and to a lesser degree, the Altamirano school. This situation is common in teacher environments and can be partially explained by the technical secondary schools’ history: union problems, political divisions, the seniority of most teachers, and limited resources. The lack of cohesion among teachers (in a framework of the absence of effective school projects) hinders any initiative of change.

This absence of work teams is closely related to one of the symptoms most commonly mentioned by interviewees: teacher apathy— isinterest in participating in collective events that are not mandatory (like contests). Teacher attitude is summarized in the phrase: “...I leave you alone so that you leave me alone.” This expression characterizes the position of some teachers with regard to the school, and with regard to other teachers. Schools exist in an inertia that tends “t.. o favor form over substance”. The school functions and each teacher does his job as he understands it, but there is no profound study of the nature of relations or the implications of processes, or an evaluation of the effectiveness and attainment of school goals.

Space for Participation and Procedures

Technical secondary schools have important spaces for participation, training and management, including the meetings of academia and training programs; unfortunately, these spaces have been underutilized. Meetings are a privileged space for ventilating academic problems and generating strategies in a collective form. In addition, they permit collective learning of common teacher problems and training considered relevant for raising the quality of education. This study, however, became aware of the low academic and pedagogical usefulness of the meetings of academia (whether zone or school meetings) and the low opinion of the usefulness and relevance of the training courses offered in technical secondary schools. One teacher comment reflects the feelings of many interviewees with regard to these meetings:

Meetings are for complaints and complaints... and we do nothing to carry out a good program. Besides, in most courses, the head of teaching arrives, hands out a bundle of papers and tells us, “There’s your course...” Sometimes they segregate us and give a course to a group of teachers who then have to give it to the other teachers... They are not very good.

Procedures and Leadership

Leadership is a crucial element of development at technical secondary schools. Where leadership exists, different activity can be seen: a result of the ability to conceive projects that permit coordinating daily activities and visualizing the tasks that orient work. Throughout the study, significant examples of leadership were observed at different levels: the director’s office at Topilejo, which introduced new school dynamics at all levels (training processes, the formation of work teams, links with the community, improved infrastructure, etc.); and the leadership of the head of the agriculture workshop in Altamirano and the computer workshop in Pedro Escobedo. Both are examples of teachers who are committed to their work, interested in influencing school dynamics and clearly aware of the potential of technological areas in contexts of poverty.

Unfortunately, the limited presence of effective management coincides with the apathy and resistance detected at most schools: it is not easy to find teachers and coordinators who impress a feeling of leadership on their activities. More common is

the inertia in which each person continues his activities. Good individual practices are present, yet on occasions are reduced to personal teaching spaces that do not affect school dynamics.

Links with Community

Due to the incorporation of the work component in the curriculum, technical secondary schools have the advantage of being able to develop significant, spontaneous links with the community. On the visits to schools, interesting efforts were observed to assimilate and incorporate the requirements of local contexts into school activity, as well as attempts to become linked and respond to community needs. Following the idea that “education does not stay within the school, but moves beyond its walls”, the technical secondary school of Topilejo was an example of a search for a new relation with the local context, in the interest of promoting a better school image, attaining parent participation, obtaining resources and developing links with the community by carrying out projects in the technological areas (promoting vertical gardens or having students participate in beekeeping in the community).

Of interest in this framework was a meeting with supervisors in the Chiapas zone. The meeting underlined the importance of a technological teacher's efforts in reaching beyond his teaching activity to become an adviser of community producers. Such an indication is relevant in terms of the links technical secondary schools are supposed to develop with their surroundings, as well as the desire not to limit action to school property. The advising role depends on the functions teachers are expected to fill in community relations. It also depends on teacher skills and commitment, and fundamentally on the school's perception of its relations with its surroundings. Teachers in technological areas have the possibility of working beyond technical training, and becoming a referent for community needs. Although the schools visited do not show sufficient examples of this role, the examples found in Altamirano and Topilejo serve as indicators of a potential strategy in the technological setting. In both cases, there is particular interest in having schools form more direct links with the communities around them, based on the idea that schools can serve as a community reference; i.e., the idea that the community can turn to technical secondary schools for support and advice, very particularly in relation to the technological area.

The “tele-secondary schools linked to the community” promote this relationship based on their own educational model. These schools form community links that view the school as a source of support (consultation, cooperation, jobs, courses, etc.). Unfortunately, in most of the cases studied, links with the community are understood in terms of a merely functional logic, with reference to heads of household and presenting applications to governmental institutions.

In this setting, it should be pointed out that schools have a great need to search for more links between different sectors and institutions, in order to: *a)* obtain economic resources to improve facilities, materials and infrastructure; *b)* develop production processes that strengthen local markets and permit poor rural communities to support themselves; *c)* redirect actions of technical secondary schools to develop projects that contribute to supporting technological activities at school while being projected into the community; *d)* join forces in searching for improved living conditions for families and the community; and *e)* to exchange knowledge with the community.

Students

Because of the study's interest in analyzing the training component in the curriculum of technical secondary schools, student perceptions are fundamental in order to discover

their evaluation of this component and its possible influence on their future careers or schooling. The following observations were outstanding in the interviews:

Most of the students are from low-income families, especially in the state of Chiapas and northern Puebla. The families do rural work and trades (masons, day laborers, drivers). In the schools in semi-urban and urban contexts, students commonly are from families that have their own business, are government employees, and even have university degrees.

Since the communities offer limited educational possibilities (concretely in the schools of Oxchuc and Altamirano, in Chiapas), the young people are required to leave their homes, live in hostels, rent rooms or travel several kilometers each day to attend school. In addition, problematic situations are generated in the teaching/learning process at these schools due to the confrontations between typically bilingual students and monolingual teachers. In the case of Chiapas and Puebla, although most students expect to complete high school, the possibility of their doing so is hindered by their families' economic situation.

The students show a high evaluation of their teachers and great appreciation for the skills acquired in workshops, as well as for the interrelation between academic and technological areas, new knowledge, practices developed in communities and the values and attitudes derived from workshops. Some students consider it useful to have learned a trade in secondary school, since it will help them to find work and aspire to higher earnings: "...I would like to be a veterinarian, and they are teaching me things in the livestock technology workshop— o castrate, vaccinate, how pigs are born" (student of livestock workshop in Altamirano).

In contrast, the students are dissatisfied with limited materials, insufficient furnishings, unclean spaces assigned to the technological activity, and the killing of animals (commonly expressed by the girls, who do not like the process): "...the pans are chipped [...], spoons are lacking [...], most of the blenders are broken [...], the gas leaks a lot [...], the tables are not wired for electricity" (student of food conservation and industrialization workshop in Temetzontla). In general, a low evaluation of the agriculture and livestock workshops is perceived at all schools, along with a desire to participate in other workshops such as computers and food conservation and industrialization.

The economic limitations of students' living conditions are a factor that considerably affects the use of their skills and knowledge. Students who apply what they learn in workshops generally do so at home, strictly for practice and their own consumption (preparation of jams, candied fruit, cookies; care of their own animals and fields).

When students select a school, the factor of influence in technical secondary schools is the positioning of the school's technological areas. Schools with tradition and prestige in certain technological areas, where the component of work is central in the curriculum (the case of "tele-secondary schools linked to the community"), affect the choices of students and their parents. Many students express a very clear evaluation of the practices and knowledge they acquire in the technological specialties, as well as satisfaction in being able to have this sort of space at school.

Implications for Policies in Basic Education

We believe that the study's results can have important implications in educational policy, in response to two fundamental considerations: a) the evaluation of the technological component within the current curriculum reform of secondary education; b) the importance of technical secondary school as a response to the needs and

expectations of marginal urban and rural contexts. In this regard, we would like to indicate five basic considerations resulting from the study:

Technical Secondary Schools as an Option

On addressing the basic consideration of the need to diversify the supply of education, it is important to encourage options that respond to: *a)* particular concerns and needs of the population of disadvantaged sectors, and *b)* the characteristics and potential of contexts. Technical secondary schools have the possibility of forming a new educational focus, in which permanent links with the needs and potentials of their contexts make schools transform along with the context, and vice versa. In other words, in contrast with the idea of education for the masses, educational options could address society's diversity.

The following considerations support the idea of technical secondary schools as an ongoing option for middle school education:

In first place, globalization, technological development and new workplace dynamics emphasize the importance of approaching the world of work from basic education. Today, more than ever, the curriculum of secondary education must provide the general bases of a technological culture aimed at contributing to this new setting and providing training in the skills it demands (a valid consideration regardless of the type of secondary school).

In second place, referring to the importance of technical secondary schools and their functions as a component of basic education alludes to the notion of relevance; i.e., the need to make the curriculum flexible and respond to the diversity of demands. In this sense, technical secondary schools are a relevant option in contexts of poverty, particularly in rural areas, where they remains current in spite of the dramatic lack of resources. Although secondary school graduates often aspire to enroll in high school, in some sectors, students have neither the local options nor the resources to continue their studies. Under these conditions, technical secondary schools can offer students employment skills that allow them to confront the world of work skills that are related to the possibilities of their contexts. In addition, students are trained in technological activities that are not necessarily agricultural, and improve their chances for alternate employment. Observations in the different schools under study show that the emphasis on technological areas has contributed significantly to students in workshops, by offering them links to options of personal development in their communities.

In third place, technical secondary schools have important functions not covered by general secondary schools. On one hand, technical secondary schools offer *added value to the curriculum*, resulting in more integrated training and a look at the world of work (depending on support and the importance and positioning of technological areas in the curriculum). In addition, such schools operate as an important instrument in *vocational orientation* by stimulating interests that are channeled in higher education (students who decide to take high school vocational courses similar to the technological areas they studied at technical secondary school). Lastly, in addition to technical training in particular trades, technical secondary schools can serve as important vehicles for *training in employment skills*; i.e., added value derived from student participation in workshops (sense of responsibility, organization, leadership, problem solving, etc., which are outstanding in the "tele-secondary schools linked to the community" of Puebla's zone 016). These skills are not commonly generated in technical secondary schools due to the typical organization of workshops.

The Virtues of the Job Training Component

The technological component of technical secondary schools offers the possibility of approaching productive practices, which acquire meaning in terms of experience and student contact with activities outside of the academic curriculum. It is helpful for the study plan to adopt an integral dimension by incorporating theoretical and practical elements. In this manner, spaces are generated for developing student creativity—places where young people learn to carry out manual activities related to the productive world. All workshops offer students the possibility of coming into contact with work: agricultural activities (planting, fertilizing), food preparation, beekeeping, building furniture, learning to weld, etc.. As pointed out by Gómez *et al.* (1993:62): “[...] the emphasis on practical work, on ‘learning by doing’, facilitates and stimulates learning; these same students in a traditional context of abstract, intellectual and passive learning, would have fewer possibilities of scholastic achievement.”

The Importance of Reforms and Adjustments to the Curriculum

Some of the schools revealed the importance of including new technologies in the technological areas of technical secondary schools. Also of importance is the need for agricultural schools, typically located in rural areas, to have complementing specialties to respond to student interests in employment training. Such schools must prepare young people for the new employment scenarios, such as computers, information systems, serigraphy, graphic design, drawing, and so on.⁶

Technological development and changes at the workplace challenge technical secondary schools to rethink the current offering of technological specialties. Courses need to be more oriented to training in technical and transversal employment skills that will be relevant and useful in the formal and informal labor markets. New plans must consider the target population and its contexts; i.e., they must take into account the probable labor markets of young people with limited resources, and the skills that will be most effective and promising in their careers.

Technological Culture and Technical Training

One of the concerns of current curriculum reforms at the secondary level is the incorporation of the component of technological education, which implies knowledge, processes and skills. It is about a new basic culture of productive work, with an awareness of the implications of technology in daily life and in the transformations of society, as well as the use of knowledge and skills for problem solving. To what degree have the technical secondary schools gone beyond technical training (skills) to offer technological culture?

The information obtained in the study contributes elements of concern regarding the infrequency this component is offered in the curriculum, as well as the absence of training programs to support this new curriculum strategy, and to some teachers’ lack of familiarity with the reform of 1995.

Clarity does exist, however, with regard to the importance of the fundamental content of technological education in the basic curriculum, and the need for the curriculum reform of secondary schools to visualize strategies that: *a)* incorporate technological culture in curriculum changes, and *b)* reinforce technical training in technical secondary schools that operate in rural contexts and marginal urban zones (which in these cases implies conserving the scheduled load of different specialties).

Need for Evaluation

One of the important corollaries of the research is the need to evaluate technical secondary schools at all levels. This type of school continues to suffer from inertia in

which many factors interact: a lack of resources, obsolete technology, teacher profiles without didactic and pedagogical tools, training programs that do not respond to teachers' interests or needs, the absence of school projects, and the lack of collectives and academic strategies, leadership and new management styles. Such a scenario creates multiple needs of evaluation with regard to the degree that training programs influence teacher practices, their characteristics, the forms of organization and management, trajectories of graduates, students' psychological and pedagogical needs, the influence of union life on school dynamics, and the offerings of technological culture.

Case studies to document successful experiences are necessary and greatly useful. The analysis has offered examples in management, as well as coordination and teaching. It is important to socialize these findings and develop other studies to discover the good practices being carried out at technical secondary schools.

An important conclusion when weighing the importance of technical secondary schools refers to the support and restructuring these schools urgently require to eliminate their lethargy and become the relevant (and state-of-the-art) option of years past. Technical secondary schools can certainly continue as an option for basic education.

Notes

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³ It is important to point out that the objective of the research was not to analyze the comparative relevance of technical secondary schools with respect to other secondary schools (general secondary schools and tele-secondary schools). The objective was to analyze the relevance of technical secondary schools for young people living in poor sectors.

⁴ The 21st Century project in the state of Chiapas was characterized by its interest in returning to technological areas in the curriculum, providing technical support to teachers, utilizing production cooperatives, and promoting relations between academic and technological areas.

⁵ The example of the technical secondary school of Topilejo is outstanding, due to the favorable atmosphere of change that was generated in the framework of the new director.

⁶ It is important to point out that students in the rural setting do not necessarily want to do agricultural activities. In some schools, parents are reluctant for their children to become involved in these activities, as a reflection of the current questioning of technologies.

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