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Educational change and its implications for social control and power in technical/vocational education.

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EDUCATIONAL CHANGE AND ITS IMPLICATIONS FOR

SOCIAL CONTROL AND POWER

IN TECHNICAL/VOCATIONAL EDUCATION

A Dissertation Presented

by

SERAFIM VERÍSSIMO LEITE DA CUNHA

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

May 1992

School of Education

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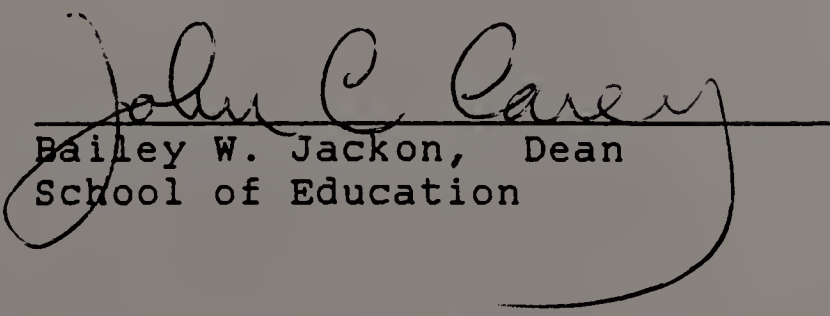Approved as to style and content by:

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iv

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ABSTRACT

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MAY 1992

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The purpose of this study is to analyze the impact of
vocational education as a process for social control in the
United States and Portugal, emphasizing the contributions
of industry and the corporate world through educational
partnerships. Specifically, the study examines how
vocational education is perceived by educators and
corporate leaders, and role of industry in either promoting
social mobility for students or perpetuating social
control. The study also analyzes the 1990 Carl D. Perkins
Act and the 1986 Portuguese educational reform.

This study uses a comparative/qualitative case study
research methodology that includes historical research in
vocational/technical education in the two countries, and
analysis of data collected in interviews that reflect the
perceptions of the interviewees in vocational education.

TABLE OF CONTENTS

The guiding question is no longer
whether the innovation produced effects
but why it was not installed.

John I. Goodlad,
The Dynamics of Educational Change (1975)

Let the main object of this, our
Didactic, be as follows: To seek and
to find a method of instruction, by
which teachers may teach less, but
learners learn more; by which schools
may be the scene of less noise, aversion,
and useless labour, but of more leisure,
enjoyment, and solid progress ...

John Amos Comenius,
The Great Didactic (1921)

INTRODUCTION

Technical/vocational education provides training for thousands of students at the secondary and college levels, all over the world. It is questionable, however, whether this form of education achieves its stated goal, which is to promote the social integration of the lower socio-economic classes into the mainstream. The intention of this study is to examine how vocational education is perceived by educators and corporate leaders, and to examine the role of industry in either promoting social mobility for students or perpetuating social control.

Vocational/technical programs were originally intended to create social and economic opportunities for all students, in particular students from lower socio-economic classes. This study will analyze the perceptions of vocational professionals, academic and corporate leaders about the ways in which existing vocational/technical programs are achieving that goal. I will restrict my focus to the period between 1960 and 1990, and to the United States and Portugal.

In Portugal, after the change of government in 1974, reforms in the Portuguese educational system were begun which are still being carried on today. One purpose of these reforms was to restructure the vocational educational

system, which sought to provide a non-socially discriminatory form of education capable of preparing young adults for employment with the help of industry.

The study will also analyze the vocational educational changes outlined in the 1990 Carl D. Perkins Vocational and Applied Technology Education Act Amendments, and that act's socio-educational context in the United States. The vocational education track is an excellent example of the way education is used as a mechanism for social control. Since it begins in the earlier school years, when students are divided into ability groups, to a considerable extent it determines their entire school lives. In these tracks, students move through their elementary education without being challenged, but are labeled as poor achievers. At the high school level, these so-called poor achievers are once more tracked into programs designed for remedial academic work, normally attached to a vocational program that will provide training in one of the trades. So the low socio-economic status of these students contributes to the very mechanism that limits their educational options, and keeps them from advancing. Whether they like it or not, the lower socio-economic groups are trapped in these programs, limiting their access to a better education thus to and social advancement.

This study will use a comparative/qualitative case study methodology, to analyze the impact of vocational education as a process for social control in the United States and in Portugal. Through this comparative case study I analyze this problem by interviewing twenty-four individuals representing five major categories: corporate leaders, academic school administrators, vocational school administrators, vocational teachers, and academic teachers. This study examines these individuals' perceptions of vocational education, explicitly focusing on their experiences. My findings can be used to build general theories, concepts, solutions and methods to address the problem of social control, and the feasibility of society's promoting people of lower socio-economic background through technical/vocational education.

CHAPTER I

THEORETICAL CONTEXT OF SOCIAL CHANGE AND POWER

I believe that education is the only way people can
attain economic, social, and political freedom. Although
freedom has different meanings, since its interpretations
varies according to each and every person's perception,
the constant adjustments to the world changes can lead to a
certain degree of freedom. In this chapter I will analyze
change and its implications in education, through changes
in power, new technologies, media and family structures,
that can directly affect school curricula. Schools must
follow society changes to better prepare and serve
students' educational needs, preparing them for the social,
technological and economic demands of the twenty-first
century.

The role of the schools as agents for social change
has long been vital to educational history. Joel H. Spring
(1972) writes:

> Education during the nineteenth century had
> been increasingly viewed as an instrument of
> social control to be used to solve the social
> problems of crime, poverty, and Americanization
> of the immigrant. (p. 62)

This attitude remains the same today as in the past, but
the responsibilities of the educational system have

increased as rates of crime, teenage pregnancy and student dropout have increased during the last decades. The financial control over public schooling should be shared between local, state and federal agencies in order to address the enormous and complex socio-economic problems facing contemporary education. But the control that comes from these agencies should not limit the curricular creativity of individual school programs, that allow for the educational freedom of a democratic education. Ideally schools should use a democratic process to provide for the kind of academic freedom that allows them to follow the approach of Amy Gutmann (1987):

> The core of academic freedom is the freedom of scholars to assess existing theories, established institutions, and widely held beliefs according to the canons of truth adopted by their academic disciplines, without fear of sanction by anyone if they arrive at unpopular conclusions. Academic freedom allows scholars to follow their autonomous judgement wherever it leads them, provided that they remain within the bounds of scholarly standards of inquiry. (p. 175)

Academic freedom allows scholars to pass on to pupils the same perception of freedom, but sometimes schooling and freedom clash, when schooling can be used as a social control agent Frank Musgrove (1979) describes the problem:

'Mass schooling' in modern industrial societies
arose as an apparatus to control the working class;
comparative data on the middle and upper classes
are rarely or never used. When attention is focused
on the education of the labouring poor, 'social
control' aspects appear prominent; but when
attention is turned to the upper classes at the same
time, the repression which they experienced seems
outrageous... It [mass schooling] could not be
understood, except at a very superficial level, in
currently fashionable terms of personal investment
in human capital. That is to say, it did not develop
because individuals thought that by going to school
they would get some economic benefit out of it....
mass schooling has arisen since the mid-nineteenth
century not to provide skills and trained
intelligence for industrial employment but to ensure
a suitably docile labour force. (pp. 72-73)

According to Musgrove, then a vital factor in

schooling is its tendency to become not an agent for social

freedom but a means of social control. As society becomes

more technological and totalitarian, it becomes more and

more difficult to adjust this control.

Change and power are discussed by all the educational

theorists, since change has been a major objective in the

ongoing process of educational reform. But change implies

power struggles among professionals, because they play

leading roles within the schools. As Seymour B. Sarason

(1982) points out:

    Power struggles took two forms: among the
professions and between each group of
professionals and those (the superintendent and the
board of education) with ultimate decision-making
power. Up until two decades ago neither of these

power struggles reached public attention, if only
because there were no developments external to the
schools that played into these struggles. This is
not to say that these power struggles were more or
less severe than what one would have found in any
other large bureaucratically organized setting,
but rather to emphasize that the variety of
professionals in the schools guaranteed that power
would be a central feature of the struggles. The
more types of professionals a setting contains,
the more it will be characterized by conflicts about
power. (p. 91)

Power tends to be understood as achievement, success,

independence and imposition of our will upon others.

Kreisberg (1986) explains it in these terms:

Power is embodied in images of the father, the
teacher, the political leader, the policeman, the
soldier, the businessman. While these roles are
different in many ways, what most characterizes their
power is the same: it is the ability to direct and
control and to manipulate and coerce if need be,
sometimes for the good of all, most often for the good
of a few. (p. 26)

It is reasonable to say that power and change are

complementary, given their mutual relationship in

corporations and in the organization, programs and

curricula of schools. Therefore professionals at the

different levels will accept change, if change empowers

them to participate directly in the management of the

organization. Change in education affects the entire

process of teaching and learning, where the teaching staff

has a more direct impact. John Dewey (1964) points out:

> Change must at least be towards more effective
> techniques, towards greater self-reliance, towards
> a more thoughtful and inquiring disposition, one
> more capable of persistent effort in meeting
> obstacles. (p. 7)

> Thorndike wrote in 1918:

> ... Education is concerned with changes in human
> beings; a change is a difference between two
> conditions; each of these conditions is known to
> us only by the products produced by it--things
> made, words spoken, acts performed, and the like.
> To measure any of these products means to define
> its amount in some way so that competent persons
> will know how large it is, better than they would
> without measurement. (quoted in Cremin, 1964,
> p. 185)

Some measurements resulting from testing can be

considered factors for change, although economic, cultural

and social conditions play a definitive, relevant role.

Change means liberation from social and cultural pressure,

which oppresses people and limits their knowledge and

integration with the mainstream, because most of the time

education is not used as a means of liberation. As Paulo

Freire (1985) wrote:

> Education of a liberating character is a process
> by which the educator invites learners to
> recognize and unveil reality critically... Adult
> literacy, seen from a liberating point of view,
> is an act of knowledge and creativity by which
> learners function along with educators as knowing

subjects. Obviously learners are not seen as
"empty vessels," mere recipients of an educator's
words. Since they are not marginal beings who
need to be "restored to health" or "saved,"
learners are viewed as members of the large family
of the oppressed. (p. 102)

The social dimension of change is at the same time
related to opportunity--the opportunity an education gives
to gain knowledge, and academic, technical, social and
cultural skills which can be used later on in life.
Education, said Dewey,

... is a social function whereby individuals are
not only trained by conditioned reflexes or
automatic reactions to stimuli but also educated
by activities and experiences from which they
learn to understand meanings in language, objects,
and events and to share efficiently in the common
interests, practices, goals, and values of society.
(quoted in Smith, 1983, p. 216)

In recent decades, however, the social aspect of
education has taken a new direction due to the important
role of the media, and the need for mothers to be part of
the work force. Today schools, together with television,
provide more than an education for children: they provide
the baby-sitting services for parents who go off to work
early and are not at home when their children return from
school. As a result, the traditional relationships among
the home, church, and school persist, but the relative

educational influence of the school and press have grown rapidly. Goodlad (1984) wrote:

> The central point to be made is that the advent of technology has added to the array of educating agencies and institutions, rearranging what once was a triad of home, church, and school. Just how the products of technology have added to and taken away from the educational role of the traditional institutions is not yet clear. But we do know that any serious consideration of education beyond school must encompass the educating being done and capable of being done by the new media of communication. (pp. 342-343)

Goodland's analysis brings us to an important focus in this project: The role of electronic technology in educational change. The media and new electronic technology have allowed us all to see new dimensions of socio-economic aspects of life, which in turn has influenced teaching and learning conditions. Students come to school with a broader view of the world, of its socio-economic, political, technological and environmental conditions, but the schools are not prepared to incorporate this awareness into the curriculum. Students' real-life experiences, although called "street education," should be incorporated into the curriculum, making it more meaningful and attractive to them. Learning and teaching is a process that encompasses all the means available to motivate the interest and curiosity of students, and to enable them to

absorb and convey information. The learning process depends on several factors, of which cognitive development plays a determining role. E. C. Silberman (1970), referring to Piaget, wrote:

> Learning cannot explain development, but the stage of development can in part explain learning. Development follows its own laws, as all of contemporary biology leads us to believe, and although each stage in the development is accompanied by all sorts of new learning based on experience, this learning is always related to the developmental period during which it takes place, and to the intellectual structures, whether completely or partially formed, which the subject has at his disposal during this period... Society, even more, in a sense, than the physical environment, changes the very structure of the individual, because it not only compels him to recognize facts, but also provides him with a ready-made system of signs, which modify his thoughts; it presents him with new values and it imposes on him an infinite series of obligations. It is therefore quite evident that social life affects intelligence. (pp. 216, 217)

Teaching methodologies have to incorporate a process that allows for a diversity of learning styles, within the developmental stages of students. This process should include a cooperative approach and hands-on activities which will help students learn from themselves and from each other. Teaching, Piaget argues,

> ... means creating situations where structures can be discovered; it does not mean transmitting structures which may be assimilated at nothing other than a verbal level.

He goes on to say:

> The principal goal of education is to create men
> who are capable of doing new things, not simply
> of repeating what other generations have done--men
> who are creative, inventive, and discoverers, [who
> have] minds which can be critical, can verify,
> and not accept everything they are offered.
> (quoted in Silberman, 1970, p. 219)

It is through a very elaborate process that learning
and teaching will have the desired impact on educational
change. Any educational program must be adjusted to a
particular time and place, and the degree and nature of its
structure must vary with the social situation. Each
theoretical educational approach applies to a particular
situation; but it is through several approaches that a
school, a curriculum and a classroom can serve the needs of
students, in a process of change. Change can lead to
freedom, as Counts (1932) says:

> Freedom without a secure economic foundation is
> only a word: in our society it may be freedom to
> beg, steal, or starve. The right to vote, if it
> cannot be made to insure the right to work, is but
> an empty bauble. Indeed it may be less than a
> bauble: it may serve to drug and dull the senses of
> the masses. Today only the members of the plutocracy
> are really free, and even in their case freedom is
> rather precarious. If all of us could be assured of
> material security and abundance, we would be released
> from economic worries and our energies liberated to
> grapple with the central problem of cultural
> advance. (p. 50)

In the seventies the propensity for liberation led educators to develop the concept of comprehensive high schools which would minimize the social differentiation of classes, with the help of a corporate society that mandated a specialization and cooperation among their members. Spring (1972) wrote, regarding this matter:

> Educators believed that the school could accomplish the goal of specialization by providing an education that would meet the needs of individual students in terms of their future occupation. The result of this thinking was a differentiated curriculum and vocational guidance. The goal of cooperation and a sense of common purpose was to be achieved through social activities. (p. 21)

In the nineties, social cooperation should promote an integrated curriculum, in which all students have the same access to higher education. And a cooperative partnership approach with industry and corporations has to be put into place, to minimize the lack of educational and socio-economic opportunity of students from lower socio-economic classes. However, partnerships have been indicated as a solution to the socio-discriminatory stigma within the vocational education context. As Grubb (1984) points put:

> ... it exacerbates a different problem: the tendency for vocational education programs to offer specific rather than general training, in the sense of training tied to one company's equipment and methods. Students may be prepared

for employment in a particular company, rather
than being more broadly trained for a range of
allied occupations or for a range of potential
employers; thus a student's future is tied to one
company... in many cases, the development of
"partnerships," especially in the form of
customized training, looks like a way for
businesses to fund their training at public
expense. There may be a real justification for
public funding of general education, but not the
kind of specific training that becomes so
attractive to post-secondary programs.
(pp. 25-27)

Change alone brings social implications that can

either decrease or increase social-control factors in

schools or industries. Today technological changes have

made people collaborate and cooperate more, linking socio-

economic and technical barriers so that only an informated

(computerized) approach to operational management can help

to solve the problems of the corporate and perhaps

educational world.

Changes in the business environment come from the

labor force, and from patterns of world trade, technology,

and political sensibility, all of which influence the

stability of the market, and create a positive or negative

climate for the transformation of the corporate

environment. This transformation brings opportunities to

the people who have been planning for it, and also provides

a chance for entrepreneurs to offer new products and

services, thus turning other people's confusion into profitable businesses.

The new models of management inside the organizations have rendered obsolete the infallibility of mechanical approaches to management. "Top executives of large corporations may be less `powerful' today than ever before" (Kanter, 1983, p. 48), reflecting in contrast an innovative organization, in which success and security will come not from domination but from flexibility. We cannot look at the management of organizations today without taking into consideration the importance of the new technology that has revolutionized the managerial process around the world. Informated technology has had an impact on all organizational management styles in one form or another: it has generated more cooperation among all levels of the organization, and allowed a more participatory involvement on the part of employers, with a reduction in the traditional imperative style of control.

Before organizations could adopt the informated approach to management, they had to develop a comprehensive strategy for introducing potential innovation techniques into a context of conventional automation, knowledge, authority and technique interdependency. Regarding managerial knowledge, Shoshana Zuboff (1988) says:

The shifting grounds of knowledge invite
managers to recognize the emergent demands for
intellective skills and develop a learning
environment in which such skills can be acquired.
(p. 391)

In order to solve the dilemma of transformation,
managers had to create a new division of learning to
support a new division of labor. Since the traditional
systems of imperative control, which were designed to
maximize the relationship between commands and obedience,
restricted the acquisition of knowledge, employers were
intrinsically less capable of learning what was offered
within the corporation to support professional mobility.
In contrast, an "informated organization is structured to
promote the possibility of useful learning among all
members and so presupposes relations of equality" (Zuboff,
1988, p. 394). Such an organization minimizes social
differences.

In an informated organization, learning produces
experiences that encourage an interest in learning among
its members, thus helping to legitimate the organization as
a learning community, in which quality rather than quantity
is the primary goal. Although economists may continue to
measure labor productivity through assembly-line
production, their measurements will be of no importance to

the informated organization, because the informated

organization is a learning institution where colleagues and

co-learners have exploration, experimentation and

innovation as their principal means of expanding knowledge.

In this context, expansion is crucial to refining the

intellective skill of the organizational management, making

managers responsible for task-related learning, for

learning about learning, and for educating others in the

continuing progress of informated applications. As Zuboff

(1988) points out,

> There is considerable interdependence among the
> four domains of managerial activity in the
> informated organization (intellective skill
> development, technology development, strategy
> formulation, and social system development), where
> integration and learning are responsibilities that
> fall within each domain, because without a shared
> commitment to interdependence and the production of
> value-adding knowledge, the legitimacy of the
> learning community will suffer. (p. 398)

Such an interdisciplinary approach would promote a

team-oriented managerial style that would allow for the

movement of members across these domains of managerial

activity and develop a homogeneity of organizational skill.

Reaching to the source of organizational integration, it

would project a vision of organizational membership,

instead of a two-class system.

If we could anticipate a change in school management
that would lead to an informated management approach to the
existing school systems, the initial reaction among the
people in the school would probably be one of fear, because
they lack knowledge and training in new technology
applications. A change from a mechanical management style,
one that rotates around the principal as the decision-
maker, would have a frightening impact on the leadership of
a school, because change requires training at all levels,
if management and staff want to be part of the on-going
learning and teaching process that technology can provide.

Interdisciplinary Curriculum and Computerization

Although teachers and administrators still resist
technology as a means of integration for teaching, learning
and educational management in the twenty-first century, in
time all schools will be totally computerized, as
Mecklenburger points out (1988, p. 18): "Electronic
learning is the new technology of education." The roles of
all school personnel will take on interdisciplinary forms,
in which management and staff will have a direct
responsibility for curriculum, decision making and policy,
since computers will provide direct access to all aspects

of school life. In this system, an informated management
approach in a school setting would lead to a cooperative
and participatory form of teaching and learning, which
could be open to direct participation by the community in
the form of educational-partnership involvement. This
approach can make a school a more diverse educational
enterprise. Teachers and administrators should not resist
technology innovation, as Mecklenburger (1988) says:

> Decisions we make today about education and
> technology will shape America's education
> capabilities tomorrow. (p. 18)

Administrators and teachers are and will be essential
in the new approach to learning and teaching by using new
electronic tools like computers. Teaching will require
more refined preparation, since the primary function of a
teacher will be to manage a laboratory that is plugged into
the entire technology network in the city, state, nation or
world, thus creating a unique dimension in teaching. As
Mecklenburger (1990) indicates,

> Teachers traditionally have been isolated from
> one another. Information technology offers the
> opportunity to end this isolation and to engage
> teachers in communities of peers within a building,
> within a district, across the nation, and around
> the world. Such connections enable teachers to
> become more effective by staying current with
> knowledge in their field, with teaching practices,

and with available new resources--much as today's doctors and other professionals do.   (p. 23)

Technology, says D'Ignazio (1987, p. 43) "transforms the culture by recasting students and teachers as producers of learning and yielding 'an atmosphere of innovation and increased productivity' that influences 'the way subjects are taught.'" The teacher will be the primary resource person, the mentor, and the pedagogical advocate for students. The technologies of the information age can prepare students for the work force, and narrow the gap between the school and the workplace. The use of electronic means in education will empower teachers to become more directly involved with students and the community as consultants for all aspects of the educational life of students at all levels of education.

The tools of information technology can be relevant to the development of interdisciplinary curriculum, not only for the basic subject areas, related to a particular idea. For example, Jacobs (1989) points out the many dimensions in which students can study the single concept of flight.

> [Students in] the Arts will study: Da Vinci's
> designs, Design Japanese kite-films on flight,
> Star wars, Mobiles; Philosophy will study: Fight
> or flight?, The ethics of airport noise, Why do
> we fly?; Math will study: Angles for a smooth
> landing, Scale models of airport, Economics of
> flying, Airfares, etc.; Science will study:

>Birds'-flight patterns, Aerodynamics, Insects
>that fly, Space flight, UFO's; Social studies
>will study: History of flight, Compare social
>value of balloon, Jet, etc., Occupations in flight;
>and Language arts will study: Biographies: Wright
>Bros, Amelia Earhart, James Audubon, and flying
>heroes: Superman, Peter Pan, and Icarus. (p. 57)

The primary function of information technology, however,

should be to integrate students' everyday experiences

into the curriculum. Again as Jacobs (1989) points out,

>We get up in the morning and confront the whole
>of our lives. It is here that relevancy comes
>into play. It is not that schools should avoid
>dealing with specific disciplines; rather, they
>also need to create learning experiences that
>periodically demonstrate the relationship of the
>disciplines, thus heightening their relevancy.
>There is a need to actively show students how
>different subject areas influence their lives,
>and it is critical that students see the strength
>of each discipline perspective in a connected way.
>(p. 5)

An interdisciplinary curriculum, capable of demonstrating

to students the relevance of an entire idea, using the new

technological tools of teaching and learning, is not yet in

place in the majority of schools, but it can be the

educational approach of the twenty-first century.

CHAPTER II

HISTORICAL OVERVIEW OF TECHNICAL/VOCATIONAL EDUCATION IN PORTUGAL AND UNITED STATES

Educational Context of Technical/Vocational Education in Portugal

To understand the need for a reform of the educational system in Portugal, it is important to analyze some aspects of its history. In some class-oriented societies, schools tend to be used as agents for class differentiation, and as Benavente (1976, p. 16) points out: "in a society divided into social classes the school is one of the agents that maintains and reproduces the class structure." However, some forms of education are used more than others to limit the access of the lower socio-economic classes to higher education and social advancement.

The purpose of this chapter is to introduce the historical view of technical/vocational education in Portugal and its relation to class stratification, as historians, politicians and educators see it. Most I have tried to quote each source as fairly is possible, but given the history of the issue I do not want to take a specific positions as to who is right or wrong.

Although the Portuguese student movement of the sixties has been seen mainly as a political statement

against the colonial war in Angola, Mozambique and Guinea-Bissau the dissatisfaction among educators also had an impact on the students who fought for political and consequently educational reform. The 1974 revolution restored democracy to the country, and in January of 1986 Portugal joined the European Community (E.C.).

Portugal was debilitated by 13 years of colonial war, with old and pre-industrial infrastructures, which made it a weak competitor in the world market: it has tried in the last eighteen years to overcome these barriers. This task has demanded tremendous effort from its people. As M.T. Emidio (1988) points out:

> Portugal, which suddenly finds itself setting off in pursuit of the other European countries in an attempt to make up for lost time, is like an athlete who starts a race after the other athletes and therefore has to try to get as close to them as he can by the time he crosses the finishing line. (p. 195)

Those who are working to prepare Portuguese youth for the future cannot ignore the technological development of other countries in the E.C.. Any educational reform should, therefore, provide for the development of academic and technical competencies which will be needed for educational and industrial development, incorporating the newest advancements in technology. One means to such

development is a common curriculum and reciprocal academic recognition among countries and their schools, such as the European Community Course Credit Transfer Scheme (ECCCTS). Although it is only in pilot form, Dalichow (1987, p. 53) recommends that through it and the European Community network for National Academic Recognition Centers, "an interchange of competencies should take form."

Although the European educational system has been marked by centralization that dates from the Napoleonic Era, Portugal today has one of the most decentralized and democratic educational systems, with a well designed democratic administration. As Ruben Cabral (1989) says:

> The democratic administration of the Portuguese schools is, theoretically, one of the most progressive systems found in the western world... (p. 422)

I believe that if Portugal is to move towards full educational democratization, it will need an "informated" or computerized educational and management system to facilitate efficient administration; it will also have to disseminate a curriculum among the regions that will directly empower all members of the school staff, parents, students, and corporations involved in the educational democratic reform. Empowerment is based on a consensus about preventing or causing change, which Rollo May defines

in these terms: "Power is the ability to cause or prevent change." May identifies two dimensions of power: possibility and actuality. He outlines five modes of power: exploitative, manipulative, competitive, nutrient, and integrative. Exploitative and manipulative powers are defined in terms of power over, competitive as power against, nutrient as power for, and integrative as power with (May, quoted by Cabral, 1988, pp. 62-63).

The empowerment of the direct participants in the educational process should help them meet the demands of the twenty-first century's computer age, and also should facilitate student and staff mobility. This will minimize the effects of what Mascati (1988) sees as "different European education systems." He sees these differences affecting

> ... conditions of access and quality of
> opportunity; the relation between education and
> employment; institutional structures of the system
> (e.g. relations between vocationally oriented and
> general education); co-operation between
> university and industry; models of financing of
> education; the role of universities in continuing
> education; organization of the academic profession;
> and legal aspects of higher education. (p. 187).

Education took a new direction when the Portuguese parliament approved the Law on Basic Education (Lei de Bases do Sistema Educativo Nº 46/86, de 14 de Outubro

(LBSE)), which sets guidelines for the entire educational system in Portugal. The implementation of the law has been very difficult, but in the last few years, more steady progress has been achieved, because the government in power still has a majority in the parliament.

The integration of Portugal into the E.C. has opened up so many opportunities for educational exchanges that schools should now be able to work cooperatively with industries, state and private universities on a partnership basis. Nationally, as Grilo and Rosa (1988) indicate:

> ... it is important to emphasize the growing willingness on the part of Portuguese businessmen to collaborate with universities in the joint development of innovation and modernization projects. (p. 211)

But this probably will not be enough. The partnerships should be extended to the international corporations and industries capable of providing the high-tech skills needed in our present and future industry. Schools and corporations should provide young people with the opportunity for an educational and social status comparable to the rest of Europe. According to the OECD (1983),

> The quality of training depends heavily on teachers and instructors having a sound

pedagogical training, an adequate level of
expertise in their field and a knowledge of the
world of work outside education. There is a need
to organize teacher training in a way whereby
universities and employers collaborate with
vocational education and training institutions...
The quality of training also depends on
individuals themselves... training depends
heavily on students being able to be in touch with
up-to-date theory and modern equipment. Keeping
abreast of theory is a further, demanding task for
teachers. Practice is uneven when only a few
teachers can take advantage of in-service training.
(p. 51)

Industrial/technical education has been a low priority
in the Portuguese educational system, and has always had
second-class status, but no other form of education has
given the lower social classes the opportunity to have a
secondary education, and through that social mobility. The
low priority given to technical education has also
reflected the slow pace of Portuguese industrialization and
the demand for specialized labor. Today, Portugal is
committed to industrial development, and to an education
capable of furthering the "informated" industrialization of
the country. To better understand the need for social
change and an educational system able to interface with its
counterparts in the rest of Europe, it is important to
look into the Portuguese educational system as it was in
the past, and its implications for social control, focusing
on the problematic vocational aspects analyzed in this

study. The historical perceptions presented in the rest of
this chapter are quoted directly from historians, political
observers and educators. Many of the translations are my
own and I am using them as fairly as possible, given the
study context. I will start by analyzing the educational
views, of Salazar and Caetano, ending the chapter with a
review of the technical/vocational aspects of the 1986
educational reform.

The Salazarist Approach To Education

Under the Prime Minister Antonio de Oliveira Salazar
(1927-1968), a finance professor from Coimbra University,
the educational system in Portugal underwent several
changes. The immediate aim was to supply the needs of an
industrialization process that unfortunately could not
reach a level of technology comparable to the other
countries in Europe.

> Salazar believed more in the power of ideas
> than in social and political action...
> Patriotism, in a Salazarist translation, meant
> no foreign debts, respect abroad and peace at
> home, suffocation of the meager present by the
> sustained cult of the past, abdication of the
> self to the good of the nation, and total
> integrity of the lands under Portuguese rule.
> (Cabral, 1989, pp. 395-396)

Secondary education was a priority during the first two decades of Salazar's government, but it was secondary technical education that received most attention from the government, as the country demanded:

> The ambitions of the plutocracy demanded industrial development, which in turn required a literate population. The liberating power of education rendered social control more difficult, undermined the strength of the state, and forced its violent hand. (Melo & Benavente, 1978, quoted in Cabral, 1989, p. 397)

Salazar believed in social peace through corporate life, to keep the nation strong and prevent violence. The corporatist system in Portugal, as Harry Makler wrote, "pretended to organize the interests of the social groups and subordinate them to the interests of the state" (Cited in Stoer, 1986, p. 41). The state controlled the socio-economic structures, and also the educational system. As Cabral (1989) indicates, "Education was viewed as a form of indoctrination, rather than of intellectual development" (p. 386).

Although educational and economic development are complementary, in Portugal the parallelism has not always been followed. Economic differences and the lack of basic education limited the possibilities of social development

for many people. This approach characterized Salazar's perception of society and school, as Mónica (1978) wrote:

> The Salazarist vision of society as an immutable
> hierarchical structure led to a different notion
> of the role of the school: it was not intended to
> serve as an agency for professional distribution
> or intellectual merit detection, but, above all
> as the indoctrination machine. Because Salazarism
> did not have, as a matter of fact, any reason to
> justify the economic inequalities that were
> inevitable and created by God. (p. 133)

The pressure for industrialization led to increased urbanization, placing the members of the dominant class in a position were they could exercise their perceptions of power relations, and maintain control over the poorer social classes. However, the dominant class could not prevent the founding of technical schools, where enrollment increased substantially every year. As Marques (1973) points out:

> New high schools and technical schools arose
> everywhere, school population increasing from
> 32,000 in 1926, [to] 74,000 in 1940,.. and
> 350,000 in 1968, ten times over. The number of
> teachers, however, did not grow proportionately,
> with the result that classes became larger and
> education deteriorated. Nonetheless, Portuguese
> secondary education did retain quality, despite
> the heavy political indoctrination in subjects
> like history, philosophy, and "political and
> administrative organization of the nation." The
> highly centralized education system led to the
> so-called "sole books" (livros únicos),

officially approved by the government and imposed
on all schools as the only authorized textbooks.
(p. 204)

The increase in the number of females attending school
between 1926 and 1940 was considerable. "The same increase
was remarkable in the number of female teachers: 5,606 in
1926, and 7,442 in 1940. During the same period of time
the number of students attending technical schools
increased from 13,085 to 55,369, of which 14,186 were
girls" (Carvalho, 1986, p. 771).

The reform of technical education and the expansion of
technical schools were the result of the government's
belief in economic development, which was aimed towards
rapid industrialization. As Sergio Gracio (1986)
indicates:

> ... the secondary educational development of the
> 50s and 60s, through technical education,
> represented objectively a 'meritocracy mitigate'
> in which attending technical schools worked as a
> means of moderating social advancement for certain
> classes, all going forward as if it were the
> greatest concession that the 'ethos' controller
> Salazar could make in the political educational
> domain to symbolize the context of the demand
> for popular educational advancement. (p. 97)

The support for technical education was also reflected
in the higher educational system with the creation of a
Technical University in Lisbon 1930. In spite of all the

changes and accomplishments in most of the economic and
educational fields, particularly after World War II,
Salazar could not transform Portugal into a well developed
country. The war in Africa was another factor slowing
Portugal's development, although it provided some stimulus
for economic development and migration. The war also
impeded prospects for a faster rate of growth at home, as
fifty percent of the national budget was applied to
military expenses. Marques says that the dependence of
Portugal's economic growth upon the overseas provinces "was
another obstacle to a full development in the framework of
a united Europe" (p. 200).

The Salazar era ended in 1968, with some good
accomplishments in the areas of economy, industry and
education during the first two decades, but with very
meager accomplishments in the second two decades, because
"education was part of the general reaction against
`modernization' and was a support of the traditional
attitudes" (Stoer, 1986, p. 49). During the later
decades, the full industrial and economic development which
was needed did not occur, for two main reasons. First,
national corporations, which were monopolies, exploited the
fragile underdeveloped Portuguese industries. Second,
because the natural reserves of the colonies seemed

inexhaustible, industrial development did not seem so vital. Absorbed by these economic concerns, Portuguese education was not a priority. Indeed, "the government was more interested in the profits, resulting from agreements with big corporations, maintaining the 'weak' economy and carrying on the colonial war, than on the educational development of the Portuguese population" (Carvalho, 1986 p. 809).

The Educational Vision of the Seventies

After Salazar had been in power for more than forty years, Marcelo Caetano (1968-1974) succeeded him as Prime Minister. Caetano's government faced the most difficult period of the colonial war, one that "forced Portugal to maintain in Africa a large contingent of troops sustaining expenses that absorbed a large part of the national resources" (Saraiva, 1979, p. 359), and further debilitating the fragile economy. As Stoer (1986) points out:

> The colonial wars seem not to make much sense
> economically, since during the 60s and the
> beginning of the 70s there existed a distinct
> displacement of the Portuguese colonial commerce
> in the direction of the E.E.C.... around 1973
> only 10% of the commercial transactions (in terms
> of imports and exports) were done with the

colonies; on the other hand, 45% of that commerce
was done with the E.C.C.. (p. 56)

The dissatisfaction among intellectuals and the
military forces in the country increased, not only because
of the political and economic consequences of the colonial
war, but also because of the "unacceptable protection of
the mercantile bourgeoisie interests by the state" (Stoer,
1986, p. 55). The combination of these factors prevented
changes that might have solved the economic crises; the
war continued to be an obstacle to development.

Caetano's first priority was higher education, based
on a university system that could reorganize the
educational process through an "industrialized university,"
prepared to make its contribution to the economic
development of the country. João Salgueiros wrote:

> ... the global process of development demands the
> expansion and continued modernization of the
> advanced industrial sectors;... the determinant
> factor in the development of any people is the
> human factor, the capacity of conception and
> organization, capable of congregating natural and
> financial recourses... translating technological
> advancements into productive realizations.
> (Cited by Stoer, 1987, p. 113).

To develop industry, Caetano had to reform the
educational system so that it could eventually serve the
social and political structures of the nation. In Sérgio

Gracio's words: "Education still is the necessary precondition for social advancement, maintaining a family position or simply escaping unemployment given an determinant level of aspirations" (1986, pp. 143-144).

According to Carvalho (1986, p. 812), it was under Professor José Veiga Simão, Minister of Education, and probably the most prestigious figure in that office in centuries, that the first guidelines for a democratic educational reform were written and debated.

> For the first time since 1926, the words "democratization of education" were used. The reform intended: (a) to increase compulsory schooling to eight years, and to reduce the school entry age of students to six years of age; (b) to establish pre-school education; (c) to reform higher education, not only the universities, but also the polytechnic and other professional institutions; (d) to reform the system of teacher education. Some other measures enacted by the government were aligned with the new thinking: (a) new schools were created; (b) alternative pedagogical experiments were initiated; (c) the school's welfare system (assistance to poor students) was increased; (d) the system of night-schools was extended; (e) some university professors who had been the victims of earlier purges were recalled and readmitted. (Cabral, 1988, p. 402, citing Stoer, 1986, pp. 57-58)

Although the 1973 educational reform of Veiga Simão was too little and too late, the educational democratic principles of the reform had an impact on the democratization of Portuguese society in general, and on

the rights of the citizens to participate in political

power. This was only possible after 1974 as Monica (1987)

indicates, because until that time,

> Equality among men was a myth: legitimate
> political power did not reside in the citizen,
> as a simple abstract concept, derived from
> concrete entities (the family, the municipality)
> with logical existence and ontologically prior
> to the political community. (p. 87)

The 1973 educational reform, although only partially

implemented, gave a new direction to Portuguese society, as

Stoer (1986) indicates:

> Through the strengthening of the educational
> institutions, the Veiga Simão reform
> established then, a partial solution to the
> problem of population mobility in order to
> facilitate the entrance of the populace into the
> political debate. (p. 59)

This led to the foundation of a democratic perspective,

showing people a direction towards which they could

reorganize their socio-political structure. But the

fulfillment of professional needs did not occur, as Mario

Freire (1990) wrote:

> The broadening of the professional horizon
> should be done by combatting stereotypes, by the
> expansion of professional expectations, mainly
> for the disadvantaged children and those from
> rural areas. (p. 144)

The economic and political discontent rose day by day.
The allegiance of the armed forces officers to the
government was no longer guaranteed, and on April 25, 1974,
a military coup d'etat took place, putting an end to
Caetano's regime.

The 1974 Educational Reform and its Impact

After 1974 the educational system moved in a new
direction, sometimes guided by government policies and
sometimes by groups of teachers, parents and students
interested in testing new methodologies and new pedagogical
approaches. They shared their ideas with administrators
and elective representatives in the schools, in a
democratic way that was entirely unprecedented. For the
first time schools, especially the high schools and
technical/professional schools, had a democratic management
approach through a Directive Council and a Pedagogical
Council elected by teachers, parents and students. These
councils gave them the right to express themselves on
decisions affecting the schools. As Stoer (1986) wrote:

> ... the April 25, 1974 revolution 'remobilized'
> the Veiga Simão reform, giving it renewed
> strength, and making it almost unrecognizable,

stretching it to areas up to then untouchable
'such as the democratic administration of
schools.' (p. 117)

The democratization of education led people to believe

that the primary function of secondary schools was to

become social change institutions, according to Mario Silva

Freire (1980):

Secondary schools have the obligation of
being agents of progress and transformation of
the community, and facilitating the integration
of the student into the concrete world in which
they will live, as an active participatory
element in social change. (p. 77)

Many people expected these educational and social changes

to liberate them from the philosophical, cultural,

political, and religious oppression which had been imposed

on the state and society by an authoritative regime. But

the reforms since 1974 have not totally abolished the

centralized educational process, since the Ministry of

Education still develops the curriculum, which is then

supplemented by material developed by teachers. Schools

still do not have fiscal autonomy, nor the power to hire

and fire their own staffs. In addition, "the Portuguese

schools do not have the possibility of utilizing all the

industrial and agricultural sources and the services to

fulfill their pedagogical needs" (Freire, 1986, p. 74).

As Ruben Cabral (1989) said:

> On a national level, the post-revolutionary
> period has been characterized by a deliberate
> search for the best educational model. The
> variables defining the "best" model include:
> democratic administration, decentralization, and
> viable and effective interconnections between the
> school, the environment, and the inherent socio-
> economic demands. (p. 426)

The reform allows for regional decentralization, but the implementation process has been very slow. Only in 1990 did the first part of the decentralization take place.

The Portuguese educational system between 1974 and 1986 was structured to include: Compulsory, Secondary and Higher Education, excluding pre-school. The first section was Compulsory (6 years), which was divided into three phases, of which the last was called Preparatory. The Secondary section (6 years), was divided into two parts: General and Complementary. The General encompassed Unified (day and evening), Technical (evening), and Apprenticeship education. Complementary covered three areas: Technical-Professional, Classical and Professional (Cabral, 1988, p. 424).

The purpose of this unification and integration of the technical and academic secondary educational system was to

> ... eliminate a situation of different social
> prestige proceeding from the existence of the two
> types of secondary education `liceal e o tecnico'
> ... in order to prevent the channelling of
> students to intellectual occupations or through
> manual occupations according to their
> socioeconomical origin..." (Campos, 1980, p. 21).

However, this system remained "tracked" and socially
differentiated, which was one of the major problems of the
elitist school system of the past. Sérgio Grácio (1986)
indicates that:

> ... the explicit intention of the responsible
> [government].. was the formal restructuring of
> the educational system, more or less guided
> towards equal schooling opportunities, as Rui
> Gracio (1983: 70) emphasizes, but above all to
> make into concrete the mandated rules of the
> 1976 Constitution, that oblige the State to
> `change the education so that it will progress
> beyond the conservative function of work for
> social division'. (p. 144)

The 1986 reform was published in the government
bulletin Diário da República, (1 Serie-Nº 237) on October
14, 1986, but it was only implemented in the 1987/1988
school year. This act also reorganized the Portuguese
educational system into four sections: Preschool,
Compulsory, Secondary, and Higher Education. Preschool
education, which is voluntary, starts at age three. The
Compulsory or Basic Education (up to the age of fifteen)
requires nine years of schooling divided into three cycles

of four, two and three years each. Secondary Education is
not yet obligatory, but students are strongly encouraged to
pursue it, because they are not accepted into college
without three more years of schooling (grades 10, 11 and
12). Secondary education has three major options. The
first is the general secondary education (classical), with
a primary goal of preparing students for college. The
second, option technical-professional education, created in
1983, also functions in a secondary school, offering a
technical component to the general secondary programs for
students who are not sure about college. The third option,
created in 1989, is professional education, which takes
place in professional schools, mostly supported by the
state and other local/state or private organizations,
developed to serve students who do not have college in
mind, but who want to join the work force. The best higher
education for students who graduate from technical/
professional schools is a three-year program at the
polytechnical schools that leads to a bachelor's degree,
with the course work transferable to an university to
pursue a higher degree.

The university or higher education is based on four/
five year programs, leading towards a licentiate degree or
higher degrees. As far as secondary technical-professional

education is concerned, paragraphs 10e and ten 10f of the

1986 Basic Education Law (LBSE) give tremendous support:

> 10e: To grant contacts and experiences
> with the world of work, strengthening the
> mechanisms of approach between the school, the
> active life and the community, activating the
> school innovating and mediating function.
> 10f: To foster a professional educational
> orientation in young people, through a technical
> and technological preparation, with a view
> toward entering the world of work.

The different technical areas of concentration in

secondary education have a general core that is common to

all areas of study, and a specific technical core, designed

to enrich the students' knowledge of their subjects of

interest. The following are examples of the course work in

the areas of chemistry technician and graphic arts

communication technician:

> General Core for both: Portuguese Language and
> Culture, Philosophy, Foreign Language,
> Physical Education, optional Morals & Religion
> (Roman Catholic).
>
> 1- Chemistry Technician-Specific Core:
> Mathematics, Physical & Chemical Science,
> Chemistry.
>
> Technical-Professional Core: Corrosion &
> protection of materials, Technical drafting,
> Instrumentation & Control, Methods of analysis,
> Work organization, Chemical manufacturing
> processes, Organic & analytic chemistry,
> Environmental chemistry and Technological
> chemistry.

2- <u>Graphic Arts/Community Technician-Specific
Core:</u> Mathematics, Descriptive geometry, History
of art, and Design.

<u>Technical-Professional Core:</u> Text analysis &
communication, Design & projection technology,
Applied physics & chemistry, Work organization,
Graphic design theory, and Expression technology
& performance practices. (Ministério da Educação,
Oferta de Formação, 1991, pp. 11-65).

This approach gives students a more solid education, a
better integration into society, and a better preparation
for entering polytechnical schools and universities, or for
work after high school. As Mario Freire (1980, p. 74)
indicates, referring to the technical core and the
industries: "there is still a great deal of information to
be given to the managers responsible for public
organizations and private enterprises, concerning ways that
they can facilitate their opening to schools."

The technical core is comparable to the industrial
arts model used in Massachusetts. It can also be compared
to the new (1990) vision of vocational education in the
U.S. which places great emphasis on academic subject matter
during the first years. An integrated curriculum approach,
in which the technical and academic competencies are
interfaced and analyzed by students through cooperative
learning, and taught by teams from vocational and academic
areas, is facilitating the intellectual and social

integration of students into the mainstream. For example,

a student's paper in electronic technology can receive

grades from three teachers, as Gursky (1990) describes:

> One from the electronics teacher for their
> mastery of the electronics concepts, one from an
> English teacher for the quality of the writing,
> and one from a business teacher for their command
> of computer and word-processing skills. (p. 55)

Concentration in a particular technical area occurs in

the last years of the secondary education, and tremendous

encouragement is given to students to enroll in a two-or-

four-year technical education program at a polytechnical

school.

Luis Imaginário (1990) describes the curricular

organization of technical-professional education in

Portugal:

> The attempt is to maximize the teachers' and
> students' investment in the process of learning
> and teaching in both subject components and to
> minimize the imbalance in school progress,
> observed in the technical-professional education
> between the components of the specific core and
> the technical-professional core. Besides that,
> the specific core subjects of the technological
> courses continue, during the three secondary
> school years, [a hard core] that equally will
> contribute to guarantee the permeability between
> the two courses determined by the LBSE. (p. 38)

The Portuguese government, through Minister of

Education Roberto Carneiro, and the Secretary for

Educational Reform Dr. Pedro da Cunha, has worked hard to put technical/vocational education in place, through technical-professional programs and professional schools that will minimize dropout and encourage students to stay in school. Joaquim Azevedo (1991, p. 4), director of the Gabinete de Educação Tecnológica, Artística e Profissional (GETAP), which is responsible for implementing technical/ vocational education in Portugal, says, "Only 15 per cent of the population pursues education beyond the 9th grade of schooling." The reform guidelines de-stigmatize technical education, which has been considered an education for lower classes and lower achievers. Azevedo (1991, p. 5) indicates this as well:

> The ETP (technical/professional education) and the professional schools, and all the offering of technological educational development, do not aim to combat educational failure. It is not an education for the unfortunates! This period has passed and the problems should not return. The technological training in technical areas aims at the personal, social and technical/professional achievement of the new young generations... a recent survey indicates that 30 per cent of the young people who finish the 9th grade would like to pursue their education in technological areas. We can say that the period of social stratification through technological training is over today. (p. 5)

The professional schools are located throughout the country and are diversified in terms of technological areas

of training, relevant to the industrial and commercial
needs of the regions. Azores and Madeira are the only
regions where technical/professional education is not yet
developed to meet industry's needs. Madeira has only a
limited technical/professional program and one professional
school. Of the nine islands of the Azores, only two have
limited technical/professional programs, and one has a
professional school.

Margarida Marques (1991, p. 7) indicates that the
preparation of young people goes beyond the technological
areas. The program covers three dominant parts: "25 per
cent of the program is based on social-cultural content, 25
per cent on scientific training, and 50 per cent on
technical/technological training (hands on)." Marques also
indicates that (p.s) about 15 per cent of the students
attending secondary education select professional
education.

Professional schools have a partnership structure that
can be connected to local/state organizations or industries
willing to prepare young people for a general or specific
occupation. During the 1989/1990 school year, and
according to the data presented by Marques (1990, p. 47),
25 autarckies, 12 local/state organizations, 25 businesses,
41 non-profit cooperating associations, 12 entrepreneurial

associations, 8 unions/syndical confederations and 9 other organizations, a total of 131 organizations, were part of the educational partnership approach developed between the professional schools and the world of work.

Other concerns about the implementation of technical/ vocational education in Portugal are related to quality teaching staff, with enough pedagogical training and content area experience to present and transfer knowledge to students. Marques (1990) says:

> Eventually the majority of teachers of the technical areas will be technicians, who simultaneously hold professional jobs. This looks positive to us... their integration, in this complex and innovative context, demands a continuous training of teachers. (p. 46)

The approach of having professional technicians work as teachers, and teachers becoming connected to industry, is used by the majority of states in the U.S., forcing technical instructors to update themselves with the latest technological innovations in industry and bring that knowledge to their curriculum. At the same time technicians entering the educational profession have to take a minimum of 36 credit hours in pedagogical and psychological teacher training in order to be certified as

teachers in their fields. This course work can be done in a maximum of three years.

In Europe, especially in Germany, students go into factories or businesses to learn directly from the instructors who work every day in these organizations. The technical/vocational education reform in Portugal has taken into consideration the policies developed by the Organization for Economic Co-operation and Development in Europe (OECD, 1983) to address the future economic, technological and social development of the OECD countries. These steps include the following:

    i)   The role and status of vocational education and training in relation to policies for general education and for economic, social, industrial, regional and local development in the context of changing economic and labor market conditions. This will include consideration of the institutional arrangements for the formulation of policies for vocational education and training; the quality of vocational education and training; measures to bring vocational education into schools, initial training and further training into a more coherent sequence of opportunities for individuals; and the effective utilization of financial and human resources.

    ii)   The implications for vocational education and training at all stages of the widening application of new technologies;

    iii)   Policies to place current short-duration work experience programs for new entrants to the labor force within a longer-term strategy for the employment of less competitive groups;

iv) The distribution of responsibilities for
     training between the public authorities and
     employers, including the effectiveness of
     financial formulae and mechanisms. (p. 8)

The 1986 educational reform became not only the
responsibility of the Ministry of Education alone. "It is
now also a responsibility of the Ministry of Labor, as well
as corporations, unions and organizations of professionals
such as teachers, engineers and economists." (Ministério da
Educação, CRSE I, 1988, p. 45). This new form of
cooperation gives technical/vocational educators an
opportunity to develop partnerships with the corporate
world that did not exist in Portugal before. At the same
time it encourages students to continue in school after
their fifteenth birthday, to receive a general education
and specific training in a technical area at a professional
school, which can lead into direct employment or further
education.

Neste Professional School (Escola de Formação
Profissional Neste) or "EFPN," in Sines, is already an
example of a partnership project that combines educational
efforts by the Ministry of Education and several Neste
enterprises, known as the GETAP business group.

     The EFPN school offers a three-year program to
     students who have completed the ninth year of
     schooling in the Sines area. When students

complete the course work and technical training
at EFPN, they will receive a certificate in the
areas of Industrial Electronic Instrumentation,
Informated/Management, and Technological Chemistry.
(Semanario Economia, Sep/29, 1990, p. 15)

Regarding the reform of technical/vocational education

in Portugal, the 1983 OECD report also indicates:

In Portugal the creation of a policy and a system
for vocational education and training is being
approached in a pragmatic, experimental way. In
1976 the existing technical secondary schools were
abolished in order to use the facilities for a
comprehensive upper secondary system. A new draft
law proposes two systems of education from the
tenth to the twelfth year of school: one system to
prepare for access to university-level education,
and another leading to working life and to higher
technical education. With a view to finding a
national system of initial skill training, a pilot
project was begun in 1980: a 3-year training scheme
was organized by the Ministries of Education and
Science and of Labor in co-operation with large
enterprises, notably military workshops, the
national steel industry, and the naval dockyard
SETENAVE. It gives initial skill training for
various trades (e.g. sheet-metal, welding,
electrical) to facilitate access to working life,
particularly for 14 and 15 year-olds who have
completed compulsory school. (p. 34)

This document reflects a clear programmatic change,

and a preoccupation with the academic and technical

preparation of students. At the same time, it makes clear

that there is support for the development of partnerships

with industry. The 1983 OECD report also indicates:

There is a common first-year curriculum, during which evidence of a capacity to learn specific skills is sought for further development in subsequent years. Although participating firms are under no obligation to employ the trainees on completion of the courses, placement and guidance are given priority by the Ministry of Labour. To establish a liaison between the Ministries of Education and Labor and to guarantee the coordination of their various activities, a Permanent System to co-ordinate Education and Work (SAPETE), composed of officials of the two Ministries, has been set up by ministerial decision. Its aim is to develop and make the maximum co-ordinated use of the existing human and other resources of the Ministries of Education and Labour in the framework of vocational education and training and of information and counselling services. (p. 34)

The cooperation between ministries calls for an organized interchange of responsibilities that are relevant to the framework of technical training and counselling of students. This counselling is used for the first time, to help students make academic and occupational career decisions, based on the understanding of an occupation and its importance in industry.

Under the Ministry of Labor the employment and training services have been reorganized by the creation in December 1979 of an Institute of Employment and Training (IEFP) which aims to meet the needs of decentralization to the major regions; the creation of institutions for joint consultation; the improvement of management methods and financial and administrative responsibilities. Finally, to take into account the development of training by other Ministries (Agriculture and Fisheries, Trade and Tourism,

Social Affairs and Justice) an interdepartmental
commission was set up in November 1980 under the
aegis of the Ministry of Labor and composed of
representatives of each Ministry and of
the regional governments of the Azores and
Madeira, with the task of ensuring, among other
things, the co-ordination of all their training
activities. (OECD, pp. 34-35)

The existing approach to technical/vocational

education could become comparable to that of the E.C.

countries, especially to the Federal Republic of Germany,

which has the most efficient and well-organized technical

educational system in Europe. As R. Russel (1986, pp. 63,

68) points out: "They [the Germans] have a sense of pride

in the technological quality of their work, and skills

provided by this type of education." Germans, Swedes,

French and British, but especially the Germans, are proud

of their technical/vocational education system, because the

way their educational system is organized, apprenticeship

programs, full-time vocational education after ages 16-19,

and adult training are not considered second-class

education.

Despite the vocational/technical educational changes

presented by the OECD report, and the Portuguese

Minister's educational reform, parents maintain a

mistrusting attitude towards technical education, as Mario

Freire (1986) wrote:

> ... officially the designation of `Liceu
> (academic or classic schooling) and Escola
> Industrial/Comercial' (technical or vocational
> schooling) has disappeared. In fact, there is
> still a difference in social status, in which
> they are all involved, from which many parents
> have not managed to liberate themselves.
> (p. 106)

The Portuguese educational guidelines for technical/

vocational education show a clear change in the process of

preparing technicians who can have an impact on industry.

Through partnerships with industry, secondary schools and

universities, vocational programs should be able to prepare

students for the reorganization and modernization demanded

by the industrial technology of the twenty-first century.

The partnership approach to technical/vocational education,

although in embryonic form, is starting to spread through

all the regions. For example the Escola Tecnológica,

Artística e Profissional de Pombal, as well as the Escola

Profissional de Leiria, are already providing technical

education to hundreds of students who have completed nine

years of schooling. The schools operate under the 1986

Ministry of Education reform guidelines for professional

education, which encourage cooperation with industry. The

schools also follow the educational requirements of the
Economic European Community (E.E.C.). As Lisbon's O
Jornal, (March 28, 1991) indicates:

> The course work confers upon students an E.E.C.
> third degree diploma, and certifies that they
> have the equivalent of twelve years of schooling.
> Thus, students will have the opportunity to enter
> the work force or to pursue higher education...
> they can work equally in Portugal or in any other
> country within the European Community. (p. 8)

The changes indicated by the reform, in conjunction
with the guidelines for technical/vocational education
recommended by the E.C., will give the secondary and
university technical educational system in Portugal a
higher comparable technological preparation. At the same
time they can transcend the educational stratification
for social control that formerly stigmatized this form of
teaching and learning.

The Historical and Educational Context of Vocational/ Technical Education in the United States

The need for change in vocational technical
educational has been pointed out in almost every decade,
based on the constant technological, economic, educational
and social changes in the United States. In this chapter I
will study several aspects of vocational/technical

education as a form of teaching and learning used in the technical and comprehensive high schools. I will also analyze teachers' new roles and means of preparation, and will describe some relevant points of the 1990 Carl D. Perkins Act, a vocational education reform measure, and its approach to corporate relations through partnerships.

Some forms of education have tried in one form or another to integrate their students into the socio-economic mainstream and provide for quality education. Other forms, especially vocational education, have limited their students' social and educational advancement, as Kenneth Gray (1991, p. 438) points out: "In more recent times, revisionist historians have gone so far as to suggest that vocational education is a plot hatched by the empowered elite to perpetuate the subservient status of the working class."

Despite this attention, vocational education continues to be seen as a social educational issue, not only because it is regarded as an educational form for social control, but because it is considered a form of tracking, which limits access to higher education and social promotion for the lower socio-economic classes. As Sara Lake (1985) wrote, research indicates that both high and low ability students do better in high-track classrooms.

Low-track classrooms have been found to have a
less productive learning environment: students pay
less attention, there are more management problems,
and the peer group tends to undermine rather than
support efforts at learning. Tracks can signify
totally separate educational experiences occurring
in adjacent classrooms. (p. 2)

Curricular differences have led to tracking becoming a

standard practice in the U.S., one which appears to be most

detrimental to poor and minority students. Lake (1988, p.

1) wrote: "Poor and minority students are overrepresented

in lower classes and are, therefore, more likely to be

shortchanged on education quality." Despite good

intentions, the curricular differences have not guaranteed

better occupational opportunities, or reduced the high

dropout rates of students attending vocational education,

as Oakes (1986) indicates:

High dropout rates continue, and the negative
consequences of placement in low and vocational
tracks suggest that a dual educational system may
actually work against the occupational chances of
vocational education students. In addition, these
students miss the knowledge and status to be gained
from academic programs. (pp. 32-33)

Therefore, strategies for change might be targeted to

what goes on at the classroom level, because as Gray (1991)

indicates:

Academically talented students who consider
enrolling in vocational education programs are

typically viewed by both their peers and their
teachers as a bit strange; it takes courage for
a talented student to enroll in vocational
education programs not just because the
curriculum is perceived to lead only to blue-collar
work, but also because it assigns a "second-class"
label to vocational students and creates peer
pressure not to enroll. (pp. 440-441)

Peer pressure has developed among students an attitude
towards programs that is sometimes difficult to change, but
educators need to be more self-conscious about the ways in
which the resources of power and influence are currently
distributed and exercised in the public schools, and they
need to find ways of changing the structure of power to
enhance the equality of educational opportunity. The
problematic aspects of vocational education raise important
questions of feasibility, need, and ethics. It seems that
schools cannot provide specific, relevant, and marketable
skills; at the same time it appears that the time available
to students at the secondary level is too valuable to be
invested in studies that cannot be measured easily by tests
of achievement in certain limited categories of knowledge.
On the other hand, specific skills of all types appear less
frequently on the lists of attributes that employers say
they want. As Oakes (1986) indicates:

    Increasingly, business and industry leaders
    cite literacy, flexibility, problem-solving skills,

and general knowledge as the best preparation for
the complex and changing demands of the workplace.
(p. 33)

Within their academic classes, vocational students

often experience a lower quality of curriculum content,

one that lacks opportunities to learn concepts, processes,

and more complex skills. This lack leads some theorists,

who hold a different view of vocational education, to

insist on an integrated curriculum that will give

vocational students the opportunity to develop the academic

competencies they will need in the work world. As Larry

Rosenstock (1991) wrote:

> Pursuing integration with academic education
> requires us to adopt a different view: that
> vocational education is a different way to learn
> the same academic concepts and skills that
> nonvocational students learn. Vocational teachers
> see students demonstrate competence, thinking
> ability, and creativity in a vocational setting
> that some of them are unable to demonstrate in an
> academic setting or on a standardized test.
> (p. 435)

On the other hand some critics, such as Swanson (1982,

p. 30) have argued that: "Vocational education should be

delayed until the postsecondary level. Other than the

preference for eliminating vocational [education] studies

from the high school."

The dualism continues today. The curricular approach
of the 90s is once more moving towards more academics and
less time spent on technical training. Thus it is in
compliance with one of the general goals of the 1990 Carl
D. Perkins Act, which some critics, like Swanson (1991, p.
30) dislike: "The Carl D. Perkins Vocational and Applied
Technology Act of 1990 is probably the worst piece of
educational legislation ever passed by Congress." On the
other hand, Gray (1991) wrote:

> A change in the curriculum that includes more
> emphasis on academics and on general vocational
> skills and concepts, as the changed mission
> implies, would better serve both those who go on
> to postsecondary schooling and those who don't.
> (p. 443)

The Value of Cooperative Education in Curricular Integration

The current emphasis on curricular integration is
intended to lead to better preparation for work and
improvements in the educational system, resulting from
vocational and academic teachers working together to
develop curriculum that can serve students' needs, while
taking into consideration the technological advancements of
business and industry in a thoroughly cooperative

understanding. Rosemary Kolde (1991) described this
intended integration:

> Academic and vocational instructors work
> together to design strategies, select materials
> and instructional methods, and develop activity
> guides, job-plan sheets, and other supportive
> instructional materials for students and teachers.
> This cooperation continues after the development
> phase, with weekly meetings of the instructors to
> discuss procedures, student achievement, new
> thoughts and concepts, and other relevant details.
> Team teaching is used when beneficial. Academic
> instructors regularly attend the vocational
> laboratories to observe how students apply the
> concepts that were introduced in the academic
> classes. The result is a learning process
> for both students and teachers. (p. 454)

Many teaching and learning techniques have been

developed that could strengthen the academic performance of

vocational students, and could also accommodate a wide

ability range of students in a single classroom. These

techniques lead to more individualized education, where

students often work on different tasks, where grading is

less competitive, differences and ability are less easily

discerned, and problems are less likely to develop.

Cooperative learning is one such approach: It entails the

creation of small, heterogeneous student teams that work on

research, discovery, problem solving, skills practice, or

other learning projects. All the team members are needed

to accomplish the task, "everyone contributes and no one

dominates" (Johnson and Johnson, 1987). To implement
cooperative learning, students must first be taught the
skills of group process and group work. As Robert Slavin
(1982) wrote:

> Cooperation is one of the most important human
> activities. Elephants have survived as a species
> because of their ability to cooperate for the good
> of the group. In modern life, people who can
> organize as a group to accomplish a common end
> are likely to be successful--in business, in
> sports, in the military, or in virtually any
> endeavor. (p. 7)

Some vocational programs at the shop level use
cooperative participatory learning as a form of learning
and teaching, but the same approach is not used at the
academic level, where students have less opportunity to
work as a group in an integrated form with students from
the same or other programs in the school. This creates a
problem that may not lie solely in improving vocational
education; it is more likely to require that the whole
structure of the secondary school be redesigned, including
its management. This would lead to a new system, in which
tensions may be reduced and curricular accommodations
become possible. As Larry Rosenstock (1991) indicates:

> A true integration requires nothing less than
> a full restructuring of high school. The first
> step is for teachers to work together, to see
> their mission as joined--not divided--between

those who prepare students for college and those
who prepare them for work. As we near the end of
the 20th century, no one can afford to think of a
high school diploma as a terminal degree.
(p. 435)

If an integrated curriculum is the solution for the

social integration and better academic preparation of the

vocational student, the results are far from visible, since

the 1990 Perkins Act is just now starting to be implemented

in vocational programs around the country. Integration has

been taking place every day in the comprehensive high

schools where students have the opportunity to take

high-level academic courses and simultaneously enrich their

technical skills on the courses offered by the technical

programs. As Rupert Evans (1982) indicates:

The barriers between curriculums are breaking
down. This has come about because students from
other curriculums began to demand access to
vocational education while vocational educators
began to relax their insistence on lists of
prerequisites for enrollment in any vocational
course. Now, some 70 percent of high school
graduates have at least one vocational course.
(p. 25)

The vocational/technical programs at comprehensive

high schools have given vocational students, and students

in other programs within the school, the opportunity for

technical and academic integration that is needed to serve

the diversity of the students' learning styles and

maturation levels. Evans (1982) also points out:

>   It is a basic principle of maturation and
> learning that youth are ready to learn concrete
> facts, skills and perceptions before they are
> ready for theory. Some neuropsychologists claim
> that less than a third of high school students are
> ready for the type of formal learning that makes
> up most of our secondary school curriculum...
> learning is affected principally by maturation and
> motivation. The facts of maturation demand that
> the principal emphasis in high school be placed on
> learning things that appear to the student to be
> concrete rather than abstract... our current
> knowledge of motivation suggests that for many
> (probably most) high school students, the best way
> to help them want to learn non-vocational ideas,
> attitudes and skills is to show them that what
> they are learning is relevant to them. (p. 25)

Therefore, motivation and knowledge maturation are

related to the cognitive developmental stages of children,

which Piaget believed to be the progressive form of

learning used by all human beings use to acquire knowledge.

Knowledge acquisition through cooperative learning is

based on developmental cognition; it uses small

heterogeneous groups to work on solving problems,

facilitating the integration of all the students in the

process of learning and minimizing learning differences.

David and Roger Johnson (1987, pp. 12-13) describe the

four basic elements that must be included in order for

small-group learning to be truly cooperative. The first of

their elements is "<u>positive interdependence.</u> Students must perceive that they "sink or swim together"... In order for a learning situation to be cooperative, students must perceive that they are positively interdependent with other members of their learning group." The second element of cooperative learning is "<u>face-to-face interdependence</u> among students... It is the interaction patterns and verbal interchange among students promoted by the positive interdependence that affect educational outcomes." The third element is "<u>individual accountability</u> for mastering the assigned material. Every group member is responsible for learning the material... Determining the level of mastery of each student is necessary so that students can provide appropriate support and assistance to one another. The final element is appropriate student use of <u>interpersonal</u> <u>and</u> <u>small-group skills.</u>

> Obviously, placing socially unskilled students
> in a learning group and telling them to cooperate
> will not be successful. Students must be taught
> the social skills needed for collaboration, and
> they must be motivated to use them. Students
> must also be given the time and procedures for
> analyzing how well their learning groups are
> functioning and the extent to which students are
> employing their social skills to help all group
> members to achieve and maintain effective working
> relationships within the group. (pp. 12-13)

The cooperative learning approach is one of many
methodologies of teaching and learning that a program or
school system can follow to motivate learning, and to
structure appropriate student interaction in classes.
The social integration for many poor and disadvantaged
students in vocational/technical education has been the
only form of education capable of giving them the
opportunity for educational and social advancement. As
Rupert Evans (1982, p. 25) indicates: "A third of the
students who graduate from high school vocational programs
continue on into postsecondary school." This is an
indication that some form of educational and social
mobility accrues to such students.

Vocational Education and Handicapped Students

Vocational education has had also a unique influence
on the preparation of handicapped students for life. After
legislation was passed in the 1970s, the movement to
support such students grew; the result was the Education
for All Handicapped Children Act (P.L. 94-142), Title II of
the Education Amendment of 1976 (P.L. 94-482), and Section
504 of the Rehabilitation Act. This legislation gave
handicapped and disadvantaged students the opportunity to

enter vocational training programs that previously had been
inaccessible or severely limited to them. As Gary Meers
(1982) indicates:

> It is clear that the movement to involve
> special needs youth in vocational education is
> here to stay. It is not an educational fad that
> will disappear within a few years, but is in fact
> an integral part of the total educational
> delivery system. (p. 35)

The specialized vocational special needs programs
allow students with disabilities or handicaps to succeed at
a job and to prove to themselves that they can contribute
to the community. To accomplish that, schools have to
adapt and prepare their physical facilities to work with
these students. School staff, in conjunction with a range
of other specialists, had to develop and adapt curricula to
serve these students' needs. Canaway (1981) outlines these
adaptations, and the professional skills required. They
include:

> A need for teachers trained by experienced
> professionals is a must. Training should be
> done by <u>special educational teacher consultants</u>
> who know how to modify teaching methods for
> handicapped students and can obtain special
> instructional materials, such as large-print
> books, captioned films, and mathematics aids.
> <u>Occupational therapists</u> who are familiar with
> commercially available aids and often design and
> make simple devices for handicapped people.
> Because they understand how the human body works,
> occupational therapists can analyze the physical

skills involved in an activity and suggest
alternate ways to accomplish them. <u>Vocational
rehabilitation counselors,</u> who are experienced in
helping handicapped people succeed in the world of
work, can help to obtain funds for special
equipment and work with employers in modifying
jobs. <u>Speech</u> and <u>hearing clinicians</u> that can help
with communication aids, and <u>Physical therapists</u>
who can recommend mobility aids. The handicapped
student himself is an important member of the team,
since his abilities and needs will determine what
accommodations are made and needed. The student
may have ideas about how to apply the adaptations
he/she uses in his/her daily life to the vocational
education setting. (p. 23)

Canaway (1981, p. 24) also wrote: "Vocational

education has the major role in teaching handicapped youth

specific job skills and in helping them take that giant

step into employment... The progress vocational education

has made in serving handicapped persons during the past

decade is often overshadowed by the urgency and immensity

of the responsibilities we face in the future."

The Perkins Act of 1990 still maintains the support

for handicapped students, and brings in the concept of

curricular integration, in which an integrating of academic

and vocational education would promote greater

intermingling of students in both curriculum streams,

bringing to an end the social isolation of vocational

education students. As Kenneth Gray (1990, p. 443) wrote:

"The integration of academic and vocational education is a

movement to reform not just vocational education but the

entire secondary education curriculum."

The Perkins Act has the support of business and industry, who have long time recognized the need for employees who have solid academic foundations, excellent social and communication skills, and competence in the basic technical skills. Businesses also will play an integral role in education by encouraging employees to work with parents in the community. In addition teachers will have new roles as learning facilitators; they will participate directly in curriculum development, budget and management. But today or in the future, educators will not be able to accomplish much without parental support since the family is the central institution of education in society.

It is important for the vocational community to recognize the upcoming changes and remain open to them. In the short run, these changes may be traumatic, but in the long run they may be the salvation of vocational education at the secondary level.

Educational Reform Through The Carl D. Perkins Vocational and Applied Technology Act of 1990

Since 1963 vocational education has been implemented and structured under the guidelines of the Vocational

Education Acts of 1963 and various amendments, passed by the United States Congress. These pieces of legislation have provided for large increases in funding for vocational education, as well as a focus on students with special needs, academic or socioeconomic disadvantages, and/or physical or emotional disabilities. In 1968, for instance, Congress recognized a need for the basic academic skills needed to function on the job. Amendments in 1972 set aside funds for students with limited English skills, and a further amendment in 1976 introduced measures to reduce sex bias and sex-role stereotyping.

A 1981 assessment of vocational education concluded that the goals of the Vocational Education Act of 1963 had not been met, despite funding increases, policy changes, and enforcement provisions. In response, Congress passed the Carl Perkins Vocational Education Act, in 1984. This was part of an effort to place more emphasis on academic skills, and to coordinate with other public and private organizations involved in job training. The 1984 act expired on October 1, 1989; by March of 1988 the Board of Directors of the American Vocational Association informed Congress of its concerns and priorities for vocational education in the 1990s.

The history of the Perkins Act actually begin before
1963. Before the 1963 Vocational Education Act was
enacted, content areas were emphasized and legislation
mandated line-item funding for each vocational program.
The 1963 act stated that funds would be available for all
vocational programs that a state chose to approve. Schools
had considerable flexibility to meet the needs of business
and industry in emerging occupations. The primary force
behind vocational education in the beginning of the sixties
was President John F. Kennedy. In his messages to Congress
on American education, on February 20, 1961, he said:

> The national Vocational Education Acts, first
> enacted by the Congress in 1917 and subsequently
> amended, have provided a program of training for
> industry, agriculture, and other occupation areas.
> The basic purpose of our vocational education
> effort is sound and sufficiently broad to provide
> a basis for meeting future needs. However, the
> technological changes which have occurred in all
> occupations call for a review and reevaluation of
> these acts, with a view toward their
> modernization. To that end, I am requesting the
> Secretary of Health, Education, and Welfare to
> convene an advisory body drawn from the
> educational profession, labor, industry, and
> agriculture, as well as the lay public, together
> with representatives from the Departments of
> Agriculture and Labor, to be charged with the
> responsibility of reviewing and evaluating
> the current National Vocational Education Acts,
> and making recommendations for improving and
> redirecting the program. (G. Reed and G. Ellzey,
> 1976, pp. 77-78)

Postsecondary vocational programs were encouraged, and
the president formed a Panel of Consultants for Vocational
Education to conduct the study that generated the 1963 act,
which indicated that "post-high-school technical training
was in an especially critical need" (Reed and Ellzey, 1976,
p. 79). Vocational education expanded into new program
areas, and started operating in communities across the
country. At the same time the panel indicated that
"graduates of high school vocational education programs
were less likely to be unemployed than other high school
graduates" (Reed, 1976, p. 80). They said that they were
satisfied with the local-state-federal partnership on
vocational and technical education,

> ... because it was capable of imparting virtually
> any specific production service or technical
> skill that may been required by national or
> international crises or emergency.
> (Reed and Ellzey, 1976, p. 78)

The 1963 act also stated that federal funds could be
used to serve students with special needs. Special needs
students in vocational education programs receive a great
deal of attention today, but that was not the case in the
early 1960s. Roger Sathre (1987) explains how this change
came about:

Congress and special interest advocates
eventually reacted to the lack of vocational
educators' interest in the special needs
provisions of the act. The 1968 Amendments set
aside 25 percent of the basic state grant, plus
additional special funding, for disadvantaged
and handicapped students. (p. 38)

With the passage of the act, the response from the

vocational community began. Every state appointed

personnel to administer these funds and encourage schools

to serve these students. A diversity of new programs were

started to provide support services to help students

succeed in vocational education.

The preparation and training of teachers was a concern

presented by the panel. The American Vocational Journal

(May, 1976) reported its that recommendations:

Teacher and leadership training programs be
improved and enlarged. Institutions of higher
education, specially land grant colleges and
state universities, should provide for the
professional growth of vocational and technical
teachers. (p. 80)

The 1976 amendments passed by Congress increased the

percentage of funds set aside for disadvantaged and

handicapped students, up to 30 percent of the basic state

grant. The amendments also required that a full-time sex

equity person be hired in each state. Vocational education

was extended to all types of institutions, as recommended by Reed and Ellzey (1976):

> Vocational educators must develop occupational programs appropriate to meet the needs of a given area in all types of educational institutions - comprehensive high schools, specialized vocational-technical high schools, junior colleges, area vocational and technical schools (both secondary and post-secondary), other public and private institutions, and private schools under contract with the state or local education agency. Programs must be offered to cover the entire occupational spectrum, excluding only those occupations generally considered professional or which require a bachelor's degree or more. (p. 84)

During the 1970s the comprehensive high school was the major educational development to integrate vocational students into the main high school. This approach gave vocational students the opportunity to study the academic content areas with the so-called regular academic students, and the regular academic students had the opportunity to take elective courses in the vocational areas.

The Perkins Act of 1984 raised the proportion of set-aside funds up to 57 percent of the basic grant fund, and expanded the identified special population to include not only the disadvantaged and handicapped, but also adults who needed training or retraining, single parents or homemakers, and convicted criminals. Programs to eliminate sex bias and stereotyping were also established. Federal

funds could only be used to expand and upgrade programs. The Perkins Act eliminated the use of federal vocational funds for program maintenance. Salaries and most other costs for operating programs would have to come from state or local funds. As Roger Sathre (1987) says:

> Within a span of 25 years, federal legislation has evolved from merely mentioning special needs students to earmarking 57 percent of the funds to serve six identified populations. Remaining funds for regular vocational programs must be used for their expansion and improvement and not "business as usual." Federal vocational education legislation has thus become social legislation. (p. 38)

Any responsible educator is aware that today the United States has many social problems that need attention, and it appears that Congress wants vocational education to be responsive to social needs. The educational and industrial press have consistently reported that schools are not doing the job today that they have done in the past. As Harry Silberman (1991) points out:

> In the years since our 1984 report, access to vocational education has worsened in many states, because new graduation requirements reduced enrollments in elective vocational courses. But other states have provided course substitutions or cross-credits for vocational or applied academic courses, or have protected student access by extending the school day and reducing class time to one-hour periods. (p. 30)

Students need applied reading, writing, and computing skills, as well as decision-making and higher-order skills, if they are to progress in today's technological workforce, which requires more from the human mind than from the human muscle. Applied basic skills will undoubtedly be dealt with as a result of the new, 1990 Perkins Act. Some reports indicate that imparting these skills is a challenge to be faced, not only by vocational educators, but by all educators if the U.S. is to maintain a labor force capable of promoting economic development. As Silberman (1991) indicates:

> .... the goals of vocational education will
> include more personal, social and intellectual
> components. The most successful technology
> programs will have to ensure that entering
> students have the prerequisite skills in science
> and math. (p. 31)

Obviously, this is a problem to be overcome by all sectors of the educational system, and vocational education must bear its share of the burden.

Increased academic demands, imposed as a result of the excellence movement, have reduced the time available for a student to complete a vocational program, creating disadvantages for students who intend to join the work force after graduation from high school. Problems remain

to be worked out, but the integrated approach provides an
alternative that is presently working in many states. As
Rosenstock (1991) indicates:

> By integrating academic and vocational
> education, by teaching all aspects of the
> industry, and by creating links to community
> economic development, schools can truly become
> more inclusive, more democratic institutions.
> The restructured high school envisioned by the
> Perkins Act draws on the strengths of all students
> and helps all students to realize their full
> potential. (p. 436)

Many secondary school graduates also lack the skills
they need to find and keep jobs. They lack direction and
too frequently are not aware of the jobs or occupational
fields for which they are suited. These students need some
career experience. As Roger Sathre (1987) indicates:

> If career education or career development is
> to be successful and if special population groups
> are to be served, counseling must be an important
> part of a school's program. (p. 39)

The career education movement of 15 years ago died;
however, many students are now seeking a prevocational,
hands-on, experiential curriculum. In Title II, Part A, of
the 1984 Perkins Act, Congress required sound guidance
components in vocational programs for all students,
including special needs students. Congress thus
demonstrated its awareness of the need for services over

and above classroom instruction, services that should be extended to displaced homemakers and unemployed adults. Although counseling functions are mentioned repeatedly in the 1984 Perkins Act, they are not currently being funded.

The implementation of the 1990 Perkins Act needs the support and participation of all educators, to make the basic principles of the Act workable in relation to all aspects of industry. In the language of the 1990 Act, these aspects are interpreted by Paul Wickstein (1991) for implementation on this form:

> Planning (e.g., at the industry level and at the firm level; various forms of ownership, including cooperatives and worker ownership; relationship of the industry to economic, political, and social context).
>
> Management (e.g., methods typically used to manage enterprises over time; methods for expanding and diversifying workers' tasks and broadening worker involvement in decisions).
>
> Finance (e.g., ongoing accounting and financial decisions; different methods for raising capital to expand enterprises).
>
> Technical and production skills (e.g., specific production techniques; alternative methods for organizing the production work, including methods which diversify and rotate workers' jobs).
>
> Underlying principles of technology (e.g., integrated study across the curriculum of the mathematical, scientific, social and economic principles that underlie the technology).

Labor (e.g., worker rights and responsibilities; labor unions and labor history; methods for expanding workers' roles).

Community issues (e.g., the impact of the enterprise and the industry on the community, and the community's impact on and involvement with the enterprise.

Health, safety, and environmental issues (e.g., in relation to both the workers and the large community). (p. 1)

The Wickstein's interpretation, goes on indicating that the traditional industrial model of vocational education seeks to ask employers exactly what jobs will be available in the future and what specific skills will be needed to do each one, and then to identify and train certain students to fit them. Whether or not that model once worked, it no longer does. An alternative model, providing students with understanding and experience in all aspects of their chosen industry, is essential because many current issues must be addressed.   Some of these are as follows.

"Academic and Problem-Solving Skills. If vocational skills are limited to a narrowly defined job task, efforts to integrate academics are likely to fail. Teachers and students see hat the academic skills needed to accomplish that task are at best minimal and diluted, perpetuating the split between academic and vocational tracks. In contrast, confronting all aspects of the problems facing an

industry and the enterprises within it gives teachers and students a rich platform for analysis, problem-solving, and utilizing in reading, writing, mathematics, science, and social studies.

Career Development and Employability. If programs provide only the skills for one job, young teenagers are forced into career choices which are unrealistic, unfair, and leave them prepared for little else. Because both individual choices and labor markets change frequently, only a small portion work in the fields for which they were trained. In contrast, students learning all aspects of an industry can explore a particular field in depth while gaining transferable skills, such as planning and management, which expand their later opportunities to do other things.

Technological Change. If programs tailor their training to today's skill requirements, even the students who stay in the field are left behind by rapid technological change within their jobs. Schools cannot predict these constant changes in job definitions, let alone afford to revamp their training equipment every year to keep up. In contrast, students with broad skills in all aspects of an industry can understand and actively participate in change.

Economic Development - If programs prepare students
only to fill the current job openings in low-income
communities, they are left passively dependent upon too few
jobs, which demand too few skills and provide too little
income for a decent life. In contrast, students who
understand and have experience with planning, management,
labor and community issues, etc. can survive, thrive,
and help others in low income communities. They can help
develop institutions which address unmet social and
economic needs through better use of people's underutilized
potential." (p. 2)

There are many ways to incorporate all aspects of the
industry into vocational education while integrating strong
academic preparation. "Vocational Agriculture programs
[for example] have always taught all aspects of running a
form; students learn not just to pick crops or use farm
tools, but how to manage and finance a farm, as well as
soil chemistry, animal husbandry, etc. This approach can
and must be expanded to programs in all areas. For
example, automotive students, instead of only learning
repair skills, can establish and run a repair shop or other
facility and, in doing so, study the history of
transportation and the automotive industry, the
relationship of the shop to other past of the industry, the

physics behind alternative engine designs, pollution and waste disposal, the role of auto workers and their organizations, etc.

"Academies," which are often school-within-a-school programs focusing on a particular industry, can be designed to involve students in all aspects of that industry. They involve teachers from a variety of disciplines in planning a carefully sequenced combination of course work and skills training. Some academies have strong links with firms in their area (e.g., electronics, health, financial services), which provide mentors, guest lectures, tours, and even summer internships for students.

In a community development approach to all aspects of the industry, the school curriculum focuses on creation of student-run development enterprises to address unmet community needs. After researching and assessing their community's resources and needs, students select, develop, and run an enterprise which serves an unmet community need, is economically viable, and is democratically managed in order to give each student experience in all aspects of the enterprise and industry. Students have established businesses providing a wide range of goods and services, including child care centers and housing rehabilitation.

Cooperative placements with existing employers can also be restructured so that the student's work experience really fosters a critical understanding of all aspects of the industry and contributes to deeper academic skills.

These are not the only paths. The creativity of vocational and academic teachers, working together with the community, should be tapped to develop other ways to bring the full range of literature, writing, math, science, and social studies to bear upon all aspects of the industry.

The ultimate criterion for any program must be how well it fosters strong understanding and experience in all the aspects of the industry enumerated above, [as well as] strong development and use of basic and advanced academic skills in all subject areas. Not all academies, student enterprises, and work placements currently do so.

Finally, [one more issue must be addressed] whose version of "all aspects of the industry" will be built into the curriculum?. For example, to allow corporations alone to define the meaning of "planning," "labor," "environment," etc. would not serve the public interests of education, [nor would it serve] students' needs for critical thinking skills. Schools should draw upon a full range of sources inside and outside the school to develop each of these aspects. Thus, there is a link between the

Act's requirements on all aspects of the industry and those on participatory planning by teachers, parents, students, and area residents." (p. 2)

For the first time a great deal of attention is given to the academic/vocational integration at the secondary and post-secondary level, tan issue hat was not taken into consideration in previous reform. As Wirt (1991), who analyzed the reform, wrote:

> The _first_ major change of the new federal
> legislation is that it begins to shift away from
> the traditional job-skills orientation of
> vocational education and toward the broader
> purpose of using vocational education as a
> vehicle for learning academic and other kind of
> thinking skills and for linking thought with
> action.
> A _second_ major change is that the new legislation
> places much greater emphasis on directing federal
> resources for vocational education to those
> districts where the needs for reform and
> improvement are the greatest... school districts
> with the highest proportions of students from
> poor families...
> A _third_ change is that the new law restructures
> the relationship between the state and the local
> school districts in an effort to encourage the
> districts to provide greater leadership in
> reforming and improving vocational education
> than they have in the past... the new law creates
> a potentially new role for the state in
> performance assessment and in the development
> and spreading of knowledge about best practice.
> The _fourth_ change is that, for the first time,
> the new law distinguishes between the secondary
> and postsecondary levels of vocational education.

The purposes at the two levels are the same, but
the funding mechanisms are different. (p. 426)

Although postsecondary technical/vocational education
(two year technical programs) is a major emphasis in the
1990 act, the educational goals cannot be achieved until
technical and academic courses do not stimulate higher-
order thinking and problem solving skills, requiring
students to take more traditional academic courses taught
in the traditional manner. This is because the new goal of
integrating academic and vocational education is designed
to prepare all students for work or further education. As
Roger J. Vaughan (1991) points out:

> Students who take intensive vocational
> education programs graduate with more total
> credits than other students, are more likely to
> enter the labor force, and experience lower
> unemployment rates than those with less
> vocational training. (p. 449)

On the other hand, "Recent findings show that high school
graduates who have taken vocational education earn more but
are generally paid the same wages as other graduates"
(Wirt, 1991, p. 429). Although this seems to be
paradoxical, because it reflects a longer working day, the
respect for vocational graduates will be determined by the
intellect and skills they show on the job. The success of
the vocational program will be measured by the

communication skills that new graduates have, and their
capacity to be flexible and adaptable to constant changes
in technology. These personal qualities require advanced
knowledge in reading, writing and mathematics. As Kolde
(1991) wrote:

> Congress has called for the integration of
> academic and vocational education. The benefits
> to be derived from this integration of instruction
> include both a better-prepared work force and an
> improved education system. (p. 454)

The New Role of Teachers and Their Preparation

Another aspect of the reform relies on the preparation
of staff for an integrated curriculum. Such a curriculum
will demand that teachers work in teams, an approach that
many teachers are not prepared to embrace, until the
appropriate staff development is put in place to guide and
train teachers who have been working for so long in
isolation. Gray (1991) believes it is prudent

> ... to reexamine the preparation of vocational
> teachers specifically, in the area of trade and
> industrial education, where the entry credential
> is typically work experience rather than formal
> training in pedagogy. This practice has served
> vocational education and its students well over
> the years because the primary mission was
> preparation for work. (p. 444)

Today the mission of a vocational instructor has changed; therefore her or his preparation has to change according to the new demands of the reform, to perform better in an integrated curriculum that is no longer restrictively trade oriented. Gray (1991) wrote:

> The essential qualification for teaching this type of program [vocational] was technical competence--verified from work experience. There is a growing consensus, however, that this practice no longer serves the profession. (p. 444)

The new vocational teacher has to be more pedagogically and psychologically prepared to involve himself/herself in group decision-making, advocacy, and subject area teaching "because teachers are [also] becoming managers of classrooms rather than lecturers, and are learning to facilitate multiple activities in small groups rather than working with an entire classroom at once" (Roberts, 1990, p. 21). Administrators will be looked upon as coordinators rather than supervisors. With an informed management and curriculum, they will be capable of promoting a better pedagogical, administrative and social integration of the school, also facilitating access to the entire managerial operation of the school system.

Corporate Views on Technical/Vocational Education

The 90s, more than any other decade so far, has been
marked by the direct involvement of the corporate world
in education, not only because computerized equipment is
more and more relevant to education, but because schools by
themselves cannot buy the newest equipment to prepare the
skilled workers needed for the 21st/century. The
intensified development of partnerships between business
and education started during the Reagan administration, as
budgetary reductions were directed at vocational education
as well as most other social programs. The 1981 report of
the National Commission for Employment Policy, entitled The
Federal Role in Vocational Education, pointed out:

> It was the position of the commission that the
> 9.9 percent of total vocational education funding
> that was contributed by the federal government
> was a minor amount and of limited value. The
> commission urged that federal support for
> vocational education be limited in the future to
> the establishment and improvement of those
> programs that were vital to the economy and
> defense posture of the United States. Only those
> programs that were in the national interest of the
> nation should receive federal funding. Federal
> funding that supported established programs
> should be eliminated and the entire responsibility
> for their funding shifted to the state and the
> local areas. (pp. 2-3)

The federal funding cuts created serious problems in vocational education, because states, cities and towns could not pick up the 9.9 percent of this funding that had been provided by the federal government; state and local budgets were facing several restrictions caused by the slowing economy.

America today is in the midst of a rapid acceleration of the technological revolution, at a time when we are trying to understand and cope with a significant shift in the country's economic structure. The economic shift implies the need for educational reform to cope with the technological revolution, as Perelman (1990) wrote.

> ... for a technological revolution sweeping through the United States and world economics is totally transforming the social role of learning and teaching... As a result, the first nation not to "reform" its education and training institutions but to replace them with a brand-new, high-tech electronic-schools learning system will be the dominant world economic leader in the 21st century. (p. 12)

Although this revolution is dramatically affecting almost every aspect of our society, it is having an especially powerful impact on education. What curricular and management direction will public education take to accommodate the technological revolution? Kearns (1989) points out the need to restructure our schools.

> If our public schools are to provide us
> [industry] with a modern workforce, prepared to
> function productively in this post-industrial
> knowledge-based society, then they must
> restructure, not only in terms of content and
> curriculum, but in terms of organization and
> performance. (p. 37)

The implications of the technological revolution are perhaps most profound for two of America's most critical institutions: the vocational education system, and industry itself. The vocational education system prepares young people to enter and contribute to our commercial and industrial economy. Thus both must adapt and change their technological strategies in order to help the global economy, investing heavily in retraining the current work force to keep pace with rapid advancements in technology.

Each of these institutions has to improve its ability to identify and respond to major economic, social and technological changes. And each must find ways to accommodate such changes with minimum disruption and maximum effectiveness, through programs that lead students to technology training, not only at the secondary level, but also at the postsecondary. As Vaughan (1991) wrote:

> Technology training must start no later than
> high school and be offered to all students... We
> need better and more vocational education to help
> people move out of the increasingly devalued
> unskilled labor force and to meet the rapidly
> growing need for skilled labor. (pp. 446-447)

Although the missions of industry and education are not identical, and while both are driven by forces which sometimes diverge, they have many interests in common. The importance of these shared interests far outweighs any differences. Foremost among these mutual interests is a concern for the products of our education system.

Educators must ensure that the young people with whom they work are well prepared to get and keep jobs in careers which promise fulfillment; at the same time industry must attract and retain well-trained and highly motivated workers. Our ability to retain intact those attributes of American life which have often set standards for the world, may depend to a large extent on our ability to better define and responsibly act upon these shared concerns. Although the concerns exist on both sides, schools are not sufficiently equipped with modern technology, and educators lack the proper training. As Mecklenburger (1990) points out:

> The use of technology has radically changed everyday business practices. You will not be surprised to learn, therefore, that computers, electronic databases, simulations, on-line communication, video, CD-ROM, satellites, and other such technologies can make schoolwork more interesting, teachers more capable, and students more engaged, and--not to be overlooked--schools managed more efficiently... when educators and

students use technology effectively, they break
through stereotypes and exceed normal expectations
of what "school" can be. (pp. 22-23)

It is widely recognized that many of the jobs for
which we are now training our young people did not exist a
decade ago. Even in the more traditional skilled trade
areas, the introduction of new technologies has redefined
the way in which training must be designed. It is also
generally accepted that the rate of change will continue to
accelerate. Many of the jobs for which we are currently
training young people may not exist a decade from now,
while new jobs which may exist at that time are at present
undefinable. This dynamic situation, particularly when
coupled with the shift from a manufacturing economy to a
service economy, represents a challenge that neither
industry nor education, acting unilaterally, can hope to
meet. Through a combined effort the gap between schools
and industry can be minimized to meet the future
educational needs our young people. But Nan Stone (1991)
points out a problem. She writes that:

> ... most schools and systems will need external
> help, if only because years of isolation have
> allowed them [teachers] to become self-contained
> and self-absorbed. One common prescription is
> restructuring, giving teachers and principals clear
> goals for their students and the freedom to achieve

those goals in the way they think best. It makes
sense in theory and in practice. (p. 60)

The problematic aspect of school restructuring is

based on its political dimension, which sometimes makes

change almost impossible. Stone (1991) summarizes this

problem well:

Nothing is more political than education, and
restructuring a school system is an intensely
political task. (p. 60)

The only realistic hope for a solution lies in acting

in concert to deal with needs in those areas of mutual

concern. But the problem remains unclear for several

reasons. How can we prepare our young people to enter a

working world whose shape is unclear, whose economy will be

determined by nascent technologies, and in which the

dominant characteristic will be constant change?

Understanding and resolving this dilemma will require

a serious reexamination of the traditional roles and

responsibilities of both institutions, and will require us

to redefine the relationship between the two. This will

need a special concentration on the areas of

communications, job development, academic and vocational

preparation. Mecklenburger (1990) wrote:

By redirecting the enormous power of technology
into the education system, government and business,
in partnership, can create dynamic and productive
learning environments for America's youth. The
educational technology revolution can affect the
processes of education... Technology can save time
for teachers, students, and administrators by
reducing the drudgery of tasks and refining the
learning process according to each student's
capabilities... Information Age technologies can
prepare students for the work force, and narrow the
gap between school and the workplace. (p. 26)

Historically, leaders in education and industry have

respected the boundaries of each other's worlds, and have

crossed over only rarely and gingerly at that. Typically,

members of the industrial community are asked by educators

to become involved in the educational system only at the

end of the educative process. They have little or no

involvement with the more fundamental aspects of schooling

such as curriculum design, course selection or evaluation.

If we are to survive the challenges of the 21st century,

more relevant dialogue must be encouraged, focusing on

mutually defined needs. Radically different communication

mechanisms must be planned. Schools cannot in the future

hope to prepare young people effectively without a thorough

understanding of current trends in the social and

industrial community. As Larry Rosenstock (1991) points

out,

Schools alone cannot improve working conditions,
raise the minimum wage, enforce laws and regulations
governing affirmative action and equal opportunity,
and promote the kind of economic development that
creates new jobs at decent wages. Furthermore, it is
not possible for local initiatives to substitute for
national policies. (p. 434)

Nor can industry continue to plan effectively without
an equally thorough understanding of the community and
school content, and the methods and goals of the training
which its future work force employee is receiving. Stone
(1991, p. 52) wrote: "Managers say that education is vital,
but only a few companies invest substantial funds in their
workers' training.... The employees who most need training
are least likely to receive it... Managers and
professionals who are already well educated receive the
most." This paradoxical situation is not helping industry,
nor is it preparing present and future workers. Businesses
can play an integral role in education by encouraging
employees to work with people in the community, allowing
time for parents to visit their children's schools, and
providing day-care facilities. Rosenstock (1991) sees even
more possibilities.

If communities can use both the human and
the physical resources of vocational schools, the
schools can become the means of joining unmet
needs and underutilized resources so as to provide

students with opportunities to learn how to affect,
if not control, capital within their communities.
(p. 434)

Suggestions for Future Cooperation

Improved communications could be developed along
several paths, one of which is suggested by the Job
Training Partnership Act (JTPA). JTPA mandates that all
decisions regarding the design and funding of local
training programs be shared between local elected officials
and private industry councils consisting of members of
local industries, school officials, members of community
organizations, and other groups. To extend slightly the
premise of this act, school districts should work to
strengthen the quality of advice and the decision-making
powers of their vocational education advisory groups by
assigning the specific responsibilities for evaluating and
suggesting improvements in the educational program.

These advisory groups should include members of
industry and representatives from unions and professional
associations with sufficient experience and interest to
make meaningful and effective contributions. Through this
means business, in cooperation with schools, can make new

technology available to education. As Stephen F. Hamilton

(1990) points out:

> This is a promising moment for new forms of
> collaboration between schools and business
> precisely because new technology, new styles of
> management, and the growth of service employment
> are enlarging the common ground for employees'
> needs and the goals of democratic education.
> Many employers now describe their ideal employee
> in terms that fit the traditional well-educated
> person: someone who is able to communicate
> clearly, perform basic math, think critically,
> solve problems, work cooperatively, and behave
> responsibly. (p. 5)

Schools must exercise care for those who are being prepared

to serve the specific needs and future requirements of the

industry, and industries must take equal care for those who

will use their technical knowledge in industry. Once

avenues of communication and interaction are established,

we can more easily approach other areas, such as job

development. Job development embraces both the preparation

of the trainee and the ultimate placement of that trainee.

Incorporating the concept of job development into a

vocational education program tends to keep the focus

on a definite goal: placing each student in a permanent,

paying job. In the past, this country's vocational

education system has committed the preponderance of funds

and time to skills training. This was perhaps an

appropriate distribution of resources when the system was training students for a market in which change was gradual and job opportunities well-defined. This approach is no longer defensible, because industry is creating jobs with new demands. As Shoshana Zuboff (1988) wrote:

> In creating jobs that demand less of the body, industrial production has also tended to create jobs that give less to the body, in terms of opportunities to accrue knowledge in the production process. These two-sided consequences have been fundamental for the growth and development of the industrial bureaucracy, which has depended upon the rationalization and centralization of knowledge as the basis of control. (p. 22)

If today's educational system is to serve its graduates well, its representatives must exercise the communication links with industry that can develop solid cooperation, in order to prepare students for the demands of the new technology. They must be in routine and continuous contact with industry so as to keep abreast of industry's needs, to identify existing openings, to develop a sense of future trends and to convey current market information to those receiving training. Students must become accustomed to processing such information early during their programs and must be taught how to incorporate it into their individual plans. Such a job development system, which is not costly to implement, may require

nothing more than a re-definition of some existing roles,
and will, if properly implemented, improve communications
between local industries and the schools.

Preparing students to fulfill the technological needs
of industry will require more than good communication
between the world of work and the school. Good
communication is one part of the solution, but it should be
mandatory to prepare students academically through a solid
curriculum that includes technological tools. Karen
Sheingold (1991) wrote:

> Today's computers and video technologies are
> more powerful and versatile than the technologies
> that preceded them and are much more widely
> available in schools than were earlier
> technologies. Moreover, their pervasiveness in
> the world of adult work has given them a new
> legitimacy is learning how to use them well.
> (p. 18)

Although classrooms continue to demand the use of the new
technologies, some educators still think that primary
students should learn to think and understand concepts and
ideas. Sheingold (1991) says:

> Educators and policy makers nationwide
> recognize the critical need for students to learn
> how to think, to understand concepts and ideas, to
> apply what they learn, and to be able to pose
> questions and solve problems. Such goals, once
> pursued only in our best public and independent
> schools, are now deemed mandatory for all U.S.
> children.... The recent report of the National

Governors' Association emphasizes that students
must learn to use their minds well in school and
points out that radical changes are required to
overhaul the school curriculum. (p. 18)

Like other forms of education, technical/vocational

education needs to reevaluate and redirect its

academic/vocational preparation. It must face the reality

that more vigorous academic and vocational preparation is

mandatory. Regardless of the job that any given student

obtains upon completion of training, the chances are

excellent that the job and the context in which it is

performed will change radically in the near future.

Throughout the curriculum, students should be prepared for

change by engaging in learning, as Sheingold (1991)

indicates quoting David Cohen, who eloquently argues:

> We know little about the instructional
> implications of the view of learning that
> pervades--implicitly if not always explicitly-
> -current reform efforts. Cohen's term,
> 'adventurous teaching,' appropriately conveys
> what such teaching involves, as well as what is
> entailed in becoming such a teacher. This
> approach also requires that schools and teachers
> make very hard choices about curriculum. If
> students are to be held accountable for
> understanding (not just memorizing), for applying
> knowledge (not just reciting), for demonstrating
> their understanding through carrying out complex
> projects, and for doing their own research, then
> they must venture more deeply into a carefully
> chosen set of topics or concepts. Teachers and

others will have to decide what curricular
material deserves such focused effort--and what
can be ignored. (p. 18)

To understand and work with the growing amount of
technological innovation that is interjected into the work
environment, incoming workers should be prepared to
challenge the technological innovations. In most cases,
this will require the exercise of firmly grounded, basic
academic disciplines.

Technical/vocational education has traditionally
provided only the grounding needed to retain a specific
job. Those being trained as carpenters, for example,
needed only that amount of mathematics necessary to secure
careers as successful carpenters. For the technological
demands of the future, however, technical/vocational
education should broaden and deepen its instruction in
basic academic disciplines to ensure that graduates find
fulfillment in their careers, because existing employees
must often be retrained, which requires greater
flexibility, and enhanced willingness and ability to learn
new skills. Technical skills should not be de-emphasized;
on the contrary, they should be expanded in the vocational
offerings available to students pursuing higher education,

but technical training needs to be flexible and adaptable to change.

The relationship between industry and education does not need radical change, nor should it be costly to implement, as long as industry's leaders and educators alike understand that each must be a welcome participant in the other's world. Much can be accomplished through a redirection of efforts and resources, and an assessment of purposes and goals. As a mutuality of interests binds the two worlds, they should meet the challenges of the future in ways that benefit all of our society.

CHAPTER III

METHODOLOGY

This dissertation addresses educational change, and
the impact that industry can have on the process of this
change, especially through vocational/technical education.
The study was conducted in the Greater Boston area and in
the Lisbon and Porto regions of Portugal, through a
comparative/qualitative case study by interviewing
teachers, school and corporate administrators in both
countries.

A qualitative research approach to data collection and
analysis is most appropriate for this study, because the
central agenda is to understand the perspectives and the
experiences of the participants. "Qualitative research
tends to analyze data inductively, thereby building in
relation to the particulars that have been gathered or
grouped together in order to gain insight into the problem"
(Patton, 1980, p. 56).

Significance

As Roger J. Vaughan indicates, "vocational education
is no longer an alternative to academic skills. It is
vital for everyone's career preparation" (1991, p. 449).

Vocational/technical education has also followed the demands of industrialization, as Grant Venn (1965, p. 63) points out: "The onrush of industrial and technological revolution in this country had, by the turn of the century, resolved the need for formal vocational training." Industrialization has demanded a skilled labor force, attracting new generations of employees who were trained and prepared to give industry technical support, but who have not attained higher social class status.

The study, then, provides for an understanding of vocational education and its relationship to social class differentiations in both countries. In addition, this study examines the role of industry in education through partnerships, which are needed for the future technological preparation of young people, and to promote social class integration and mobility.

Finally, this study provides information about the role of government in the development of appropriate means to reform the present state of vocational/technical education, towards a more socially integrated and less socially discriminatory form.

Research Questions

The problems examined are included in the
following questions:

a. Has vocational education been used more or less
    than other kinds of education as a form of social
    control?

b. In what ways can industry have an impact on the
    educational process to minimize social
    discrimination?

c. In what ways can corporations help public schools
    to include students from low socio-economic status
    in the technological job opportunities of the
    twenty-first century?

d. How can the power of an "informated" managerial
    approach (computerization), used in the corporate
    world, empower teachers and school administrators
    alike?

Limitations of the Study

The findings may only reflect problems specific to the
knowledge and perception of the group of individuals chosen
for the study, and not necessarily those of all

institutions within or outside the region.

Even though this study is aimed in part at gathering perceptual information about vocational/technical education and its impact on social control, the researcher approached this study with the full recognition and understanding that perceptions vary from individual to individual depending on the nature of their life experiences.

It is not the intention of this study to discredit vocational/technical education or any other forms of education.

Definitions of Terms

For this particular study, the following terms are defined as follows:

External barriers are conditions that exist outside the control of schools that are derived from ideological and educational differences in educational philosophy, politics and budgets, which impede or limit the implementation of programs or partnerships with industry. Barriers such as these tend to contribute to the situation, but not to the exclusion of other factors.

Internal barriers are conditions developed by competition among programs that are compelled to be selective in limiting the access of the so-called "low

achieving students" to restricted academic programs.

Oppression is the systematic control by a class and
its members of another class, from the distribution of
goods to access to education and consequently to social
promotion.

Perception is a process through which individuals gain
knowledge by extracting information from their environment.

Social control is the assignment of prescribed roles
by the dominant class for the purpose of channeling the
oppressed class, and of predicting their behavior.

Professional achievement is such a relative term that
it is used in its broadest possible sense. It
incorporates, but is not limited to, notions of
occupational aspirations, effectiveness, accomplishment,
performance, success, and status as well as professional
and personal empowerment.

Research Assumptions

The design of the study is based on a series of
assumptions:

   1. The current structures of the public educational
      institutions continue to have an adverse effect on

the availability of advanced academic training for the lower socio-economic classes.

2. School systems continue to regard vocational/ technical education as a second class education, where lower achievers, linguistic minorities and members of low socio-economic status groups are placed.

3. Industry lacks confidence in public education, diverting its sources to private education, or developing its own educational approaches to educate and train workers.

4. Through partnerships, schools and corporations could create an ideal learning environment, using a cooperative learning approach, where students from different ability levels can learn simultaneously, promoting educational and social integration.

Research Setting

The setting for this study was the individual work places of the subjects. It is my assumption that the familiarity of their working and social environment provides an atmosphere of confidence. This in turn tends to significantly affect the extent to which pertinent

information is elicited, and the ease with which the interviews are accomplished.

Research Population

Potential subjects for this study were identified through contacts the researcher developed within Cambridge and Boston, Massachusetts, and the Lisbon and Porto regions in Portugal, and through referrals from the participants themselves. The sample included twenty-four individuals. The sample included academic and vocational teachers, and school and corporate administrators. The interviews were conducted with seven teachers, three school administrators, and two corporate leaders from each country. The total sample therefore was composed of twenty-four individuals, twelve from each country.

Procedure

Participants were contacted by telephone, then by mail in order to explain the nature of the study and to determine their availability. Participants were mailed a description of the research, and the appropriate human subjects consent form. They were requested to return the signed consent form two weeks from the date received. Once

these were received, telephone calls were made and letters sent to arrange interviews. This study included comparative historical research to identify and determine the parallel aspects of the demands for vocational education, and its implication for social and intellectual mobility. The research encompassed an analysis of historical data, principally books, statistical data, and other publications.

Instrumentation

The instrument used in this study was the questionnaire given below, which was used in a open-ended format for collecting qualitative data.

This approach to interviewing was selected for several reasons. First, it ensures that basically the same information would be obtained from all respondents; second, it helps to make the interviews more organized and comprehensive, because the issues to be discussed in the interview have been delimited; third, it allows for further exploration and probing on the part of the interviewer.

While the same questions were asked of each participant, each individual could respond in his or her

own terms and frame of reference, thereby creating a common framework for comparison of responses.

The interview protocol was as follows:

1. Do you perceive education as a form of social mobility and promotion or as a form of professional advancement? Please elaborate.

2. Do you think that vocational education has been used more or less than other kinds of education as a means of social class differentiation? Please elaborate.

3. What is the place of vocational education in the global educational context in this country today?

4. Has technical/vocational education been used the same as other forms of education as a means of social control? Please elaborate.

5. Some educators see tracking and vocational education as forms of social control. If this is so, what are the alternatives to minimize this problem?

6. Do you think that an educational communication gap exists between schools and industry? Please elaborate.

7. How can industry help vocational education to prepare young people for the technological demands of the future?

8. Do you think that corporations and schools should develop partnerships to minimize the learning gap between the real world of work, and what is learned in school? Please elaborate.

9. Do you believe that a computerized or "informated" management approach used by the corporate world could minimize the power struggle existent in schools, between staff and administration? Please elaborate.

10. Do you think that a computerized (informated) educational system can help with the interchange of curricula among countries? Please elaborate.

Questions translated into Portuguese:

1. Considera a educação como sendo uma forma de mobilidade e promoção social ou uma forma de promoção professional? Por favor elabore.

2. Pensa que a educação técnica/vocacional tem sido usada mais do que as outras como um meio de estratificação social? Por favor elabore.

3. Num contexto global qual é o lugar que a educação vocacional ocupa hoje no País?

4. Tem a educação técnica/vocacional sido usada mais do que as outras, como forma de controlo social? Por favor elabore.

5. "Tracking" (Agrupamento e manutenção de alunos consoante o seu nivel de funcionamento [performance] educacional) e educação técnica/vocacional são consideradas como formas de controlo social. Se assim é, qual será a melhor alternativa para minimizar este problema?

6. Pensa que existe uma lacuna em comunicação educacional entre as escolas e a indústria? Por favor elabore.

7. Como pode a indústria ajudar a educação vocacional na preparação de jovens para as exigencias técnicas do futuro?

8. Pensa que as empresas indústriais/comerciais e escolas devem desenvolver associações (Partnerships) para minimizar a lacuna entre o mundo do trabalho e o que se aprende na escola? Por favor elabore.

9. Pensa que o metodo informatizado que vigora na gerência das empresas poderá minimizar a divisão de poder existente nas escolas,

entre professores e administradores? Por favor
elabore.

10.   Pensa que um sistema educacional informatizado
       poderá ajudar num intercambio de curriculum entre
       países? Por favor elabore.

Analysis of the Data

I addressed the research questions by gathering data
as presented in the interviews.

In the first step of the process, the interviews were
transcribed by a professional typist. I then reviewed all
the transcripts, and listened to the tapes to check for
accuracy. I then read the transcripts to gain a strong
sense of familiarity with each individual.

I selected and grouped together the responses to each
main research question, then searched for themes and issues
which the interviewees raised without being directly
questioned. In chapter 4, I present the data gathered from
the interviewees according to each of the research
question, noting patterns, similarities and differences.
Selected excerpts illustrate particular perspectives and
issues.

CHAPTER IV

FINDINGS AND ANALYSIS

One of my primary aims in conducting this study was to compare technical/vocational education as an agent for class stratification and social control, in both the United States and Portugal. In order to make that comparison I developed a series of questions that elicited the data for analysis. The questions also reflect the perceptions of the interviewees on the educational views of federal, state, local and corporate agencies, as to how educational change can be fostered through partnerships.

In this chapter I will introduce the interviewees' responses to the three major questions of the study: social mobility, computerization and the role of industry as an agent for educational change. Both groups' answers are presented and analyzed in the context of the study main questions.

Education, Social Control and Social Mobility

The Portuguese legislation mandating educational reform was passed in 1986, and implemented in 1990, as well as the Perkins Act of Vocational and Applied Technology in the United States. Both are pieces of legislation that can

lead to several valuable goals: educational change, universally high quality of education, minimization of social differentiation, and school computerization. The reforms should promote social mobility for participants in the programs, when this new vision of technical/vocational education is fully implemented.

For decades, technical/vocational education has been a major issue in the debate about social control and social mobility through education, and the ways education can lead to social stratification.

The study participants in both countries were unanimous in responding that they perceive education as a means for social promotion or professional advancement. An American school administrator said:

> Social promotion and professional advancement
> are inextricably intertwined... Historically,
> education has enabled persons of humble origins
> to ascend to the highest of places, and in the
> United States education continues to be considered
> as the best vehicle for upward mobility...
> A good education is also a condition sine qua
> non for professional advancement.

A technical teacher said:

> I strongly believe that education is the
> vehicle for both social promotion and
> professional advancement for the individual, and
> the single most important element in the survival
> of advanced civilizations.

A corporate leader indicated the same sentiment:

> I do not think that there is any question that
> it is both. Education is a form of social mobility,
> promotion and professional advancement.

Turning to the Portuguese respondents, a school

administrator said:

> Education can be seen as both. We cannot
> discard social promotion without education,
> although it is not the immediate end, but the
> direct consequence.

A philosophy teacher indicated:

> The educational purpose does not exhaust any
> of the evident alternatives on this question. So,
> the objectives of the educational process aim in
> the first place at the total intellectual, moral,
> affective and physical dimension of a human being,
> and through that society will benefit, from his
> personal performance in a competent professional
> role.

A corporate director said:

> To me both things are inseparable, but in
> professional terms education undertakes a more
> and more important role.

On the other hand, an American technical/vocational school

administrator said:

> The sub-text of education is not to allow
> people to migrate upward to social strata, but
> rather the sub-text is to keep them locked into

the strata from which they came. So, I would say
that the goal of education is to provide social
mobility. The reality of education is to diminish
that mobility.

As indicated, these educators and corporate leaders

believe that education is the major factor in professional

promotion and social mobility, although we should remind

ourselves that education is only one factor in professional

promotion and social mobility. At the same time we should

ask ourselves whether we are educating people to be

promoted, or are people promoted because they are educated?

Education should be guided by the basic principles of

educating the entire human being, above all the immediate

needs of society. This educational view is not implemented

in all forms and levels of education, in which social

classes are differentiated, whether by voluntary or

involuntary means.

Class Stratification and Tracking

Technical/vocational education has been seen in both

countries as a form of social class stratification, by

tracking lower social class students into programs that

have a lower success rate, and yet aiming to help

youngsters to be economically, professionally and socially

successful in the mainstream. The participants in this study were asked whether social stratification through tracking, focusing on technical/vocational education, has been used more than other forms of social control. Their answers were somewhat comparable, although the factors that led to their opinions varied. The American group's perceptions of tracking and class stratification where diverse, but emphatic. A teacher of computer-aided design (CAD) and drafting indicated:

> Conceptually no, but in actual implementation, I would have to agree.... It has been the traditional and existing trend to direct the disadvantaged, language deficient, limited ability and social problem students towards vocational education in such disproportionate numbers so as to almost assure the predictability of failure. I am also of the belief that there is a distinct communication gap relative to educational goals between elementary and secondary institutions.... This results in inordinate tracking which needs the cooperative attention of both elementary and secondary education.... To be sure, class distinctions are inherent in a nation where such a disproportionate amount of the wealth is controlled by so few. But I think to claim that we exist in a caste state would be erroneous.

A special needs teacher indicated:

> I think that vocational education has come to be (unfortunately) a means of social class differentiation.

When asked how to minimize tracking, she replied:

> Ensure that all students in vocational education
> have equal access to academic programs in the high
> school setting. Relate, teach, and extend the
> vocational education skills so that when the
> students graduate they have access and ability to
> go on to higher education of their choice, and
> are able to find employment upon graduation in
> their field.

A technical teacher (electrician) answered the

question in these terms:

> Yes. Vocational education has been a dumping
> ground since its beginning. Check a cross-section
> of scores from SATs, PSATs, CATs, or any other
> general type of test that is given across the
> board, and you will find that vocational students
> have been consistently scored much lower.
> Coincidence?

Another technical, teacher who also teaches auto mechanics,

said:

> In the blue collar workforce the least educated,
> culturally different, racially and ethnically
> different, tend to be kept on the lower strata of
> our society as a hole that seems to become deeper
> as the differences between the more educated and
> affluent sections widens.

Regarding tracking, an executive director of a school of

technical arts indicated:

> To eliminate tracking is basically reflective
> of the alternatives of the new Perkins Act which
> made a very significant change. Formally, the

federal dollars followed special populations,
economically disadvantaged, and educational
disadvantaged. Now the law [Carl D. Perkins Act,
1990] is very different, the money does not follow
the populations. The money goes to programs of
sufficient quality, no tracking. Programs of
sufficient quality, or to improve them to attain
such a sufficient quality, so that you can have
equal rates of access and success in those
programs, by a special population of students.

A writing/English teacher said, "I think vocational
education is part of the overall tracking picture." He had
several suggestions: establish small heterogeneous groups,
self-directed units, introduce integrated interdisciplinary
studies around thematic units, use team teaching to
minimize the problem of tracking. A social science teacher
suggested that good alternatives to tracking would be
heterogeneous grouping and universal vocational experience
in school.

A corporate manager, referred to the backgrounds of
teachers as a reason for social class stratification
through tracking:

Definitely, I think one of the key things is
educating the educators... I think people who
pursue a teaching career in academic subjects,
really do not know much about vocational
education. I would be a good example; being a
teacher I really did not learn anything about
vocational education.

A technical staff manager of an engineering corporation indicated:

    I do not think, looking from an outside
perspective, that one could say that [vocational
education] is a means of social class
differentiation, but I think that it is a
negative way of looking at it. If I have to hire
students from Northeastern or Wentworth
cooperative programs I would hire a youngster who
went to a vocational high school, which means to
me that he/she has hands-on experience. I had a
couple of those that were absolutely ideal, they
had everything that one would want. I think as
well that sometimes trade schools tend to
de-emphasize reading, writing and arithmetic, and
they need to emphasize the foundations, the
basics.

An American multinational corporate director answered
the question in these terms:

    Intentionally or not, there is a social class
differentiation that happens when people consider
vocational education. [On the other hand] ...
kids who graduate from some of the better
vocational schools have useful, productive
working lives and attain some modest success much
more quickly than kids who are in comprehensive
high schools. So, I think that good vocational
education is one of the best kept secrets around.

Turning to the Portuguese group, I found they had two-
part answers to the question on social stratification
through technical/vocational education. All the
participants indicated that before April 25, 1974
technical/vocational education was a form of social and
class stratification, but that after the 1974 "Carnations

Revolution" a different perception developed in the

country. A technical teacher from the Porto region said:

>   Technical/vocational education in Portugal
> before 1974 was a way of stratifying the society
> to allow low-income families to get a decent-
> paying occupation for their children, as soon as
> possible. Today I think that technical
> occupations in Portugal are not a form of
> economic stratification, although the education
> obtained imposes a cultural barrier that in a
> certain way will represent a specific social
> structure.

A technical teacher from the Lisbon region referred to

the present status of technical education said:

>   The stratification has been modified during
> the last generation; I notice a change in the
> social web. For the total integration of
> Portugal into the European Community (EC),
> technical/ vocational education is indispensable
> to the preparation of national technicians who
> have to compete in the community's job market.

A multinational corporate leader also said:

>   The so-called technical/professional
> education led to a certain stratification in the
> past, but in the last few years I have noticed a
> great development, although the access to higher
> education remains very problematic because the
> admission numbers for state universities are
> still very restricted.

Thus there seem to be common aspects of technical/

vocational education in Portugal and the United States.

Tracking, is a means of social class differentiation based on the same premise of education as appropriate for a given social class. The premise is that, either because of parental need or by following parental/neighborhood role models, young people from lower social classes are attracted or tracked into technical programs more than are young people from other social groups. The perceptions of my American respondents reflect those conditions, and changing alternatives, including the Perkins Act, are not yet seen as successful options to minimize the problem.

In Portugal the problem of social stratification through technical education has a direct connection with the educational system before 1974, and since then there have been better opportunities for social promotion and mobility through technical/professional education. The answers, however continue to reflect a certain skepticism as far as higher education, a skepticism that probably will remain, if secondary education continues to offer its three major tracks. There are the classical (restricted academic), the technical/professional, and the professional schools, which are mainly tracking ninth grade students into trades that are offered to students in a partnership approach by state or local industries. Due to its

structure, the access to higher education in Portugal still very limited. For example, a philosophy teacher said:

> The technical professional curriculum places the students at a tremendous disadvantage in relation to the regular academic curriculum, and students complain about the lack of preparation for the examination they must pass to enter higher education.

A member of a high school directive council indicated:

> Today I do not believe that great discrimination exists; to succeed in life it is not necessary that all people become doctors. The difficulties of access to higher education are factors to be considered; because an average student has difficulty getting into a university, therefore they prefer to follow that form of education.

It is important to understand that in both countries technical/vocational education has been perceived as a form of social class stratification, and that the involuntary or voluntary mechanisms to place students in those programs are parallel in form and nature.

Partnerships and their Role

Today more than at any time in history, industry has become more dependent on high technology to fulfill the world's competitive demands. Training future workers requires high quality equipment and very sophisticated

technical skills, which schools cannot readily provide due to budget constraints, the fast pace of changes in technological equipment, and industry's lack of participation in education, at the federal, state and local levels. To understand the perceptions of the study's participants on this matter, I asked questions encompassing the need for partnerships, the communication gap between schools and industry, and the ways in which industry can help technical vocational programs to prepare young people for the technological demands of the future.

The answers were nearly unanimous in the United States, but in Portugal the perceptions varied. The centralized educational system, particularly the schedule and number of required courses that each student has to take, would make it very difficult to manage a partnership approach with the academic and technical/professional programs. On the other hand, a partnership could be perfectly acceptable and manageable for the professional school programs.

The Portuguese participants in the study indicated their views in these terms. An engineer/technical teacher said:

> Personally I think that in general there
> exists a communication gap between schools and

industry. In Portugal the lack of dialogue
between schools and industry does not help the
training of technicians, and therefore the
technological development of the country. At
the same time the majority of the technical staff
could not follow the technological advancements,
because they never had that opportunity. Thus,
we should start by retraining the staff, in order
for them to become more up-to-date with the new
technologies. I have no doubts that equal
relations between school and industry will be
highly beneficial for both students and industry.

As far as partnerships go he indicated that, if there are

basic structures, proper up-to-date equipment and

appropriate staff training, it is not necessary to develop

those associations between industry and school. A

corporate consultant from Lisbon, on the other hand,

indicates that the communication gap is a fact recognized

by everyone, in the schools and from industry. He

indicated as well that partnerships should be developed,

and suggested that corporations participate in the

development of programs, making technicians available as

teachers, or as seminar speakers. He also believes

industries should subsidize training centers.

A member of the comprehensive high school council in

Lisbon indicated that the lack of communication is evident

but must be pointed out; on the contrary, she says,

... we still do not learn in school what we need
in the real world. The school must be active and

more realistic. There is room for partnerships but it will be very difficult, because our schools are overcrowded and the academic curriculum is so vast that students do not have time for those extra activities.

Another executive director, from a technical school in Porto, indicated as well that the gap in dialogue between schools and industry is a reality. She commends the partnership approach, saying it can establish a more direct communitarian relation between schools and industry, and the efficacy of results can be relevant. An academic teacher indicated that:

> the students who graduated from the Portuguese universities have never done scientific investigation, using methodologies with practical applicability. Although some Portuguese universities have specific courses aimed at the needs of industry, some are subsidized by [industrial and commercial] corporations to fulfill their needs. Other corporations subsidize schools for the permanent training of their employees. However, I believe that the Portuguese education system is rigid and conservative, and is in an ongoing crisis towards the professional world.

A director of a multinational corporation in Lisbon indicated:

> I have no doubts about the communication gap between schools and industry, but schools depend on state money, including universities which never had to do fund raising, or involve themselves in outside projects for that matter. Only in the

last few years have some cooperative projects
started to happen although bilateral contacts can
still be very restrained. Schools look for
funds, and corporations look for employees, but
there is a lack of strategic vision among both
institutions. I think partnerships are essential,
and are occurring at the new universities in
Aveiro, Minho etc., because in the universities
where the old "cathedra crocodiles" exist, where
the existence of technological knowledge is
questioned by the corporations, partnerships
are not developed yet.

A school technical/vocational executive director

[directive council], said there is a gap in communication

between industry and schools. At the same time he

indicated that among 142 teachers teaching at the school

only a few are willing to contact the different industries

in the area to set up possible partnerships. He indicated

as well that teachers do not have any commitment to extra-

curricular activities; they teach their 22 hours plus 3

preparation hours a week and move on to their second job.

Those teaching night programs teach less than 18 hours

weekly, for the same payment scales and benefits as a day

time teacher. Night teachers, however, are less committed

to an innovative school curriculum than are day teachers.

There is a logistic reason for this difference in

levels of commitment. Secondary public schools in Portugal

have three shifts: This situation allow senior teachers the

first choice as to the time of day they prefer to teach.

The school day starts between 8 and 9 AM; the second shift

starts between 1 pm and 2 pm, and the last shift starts

around 7 or 8 pm. Some senior teachers prefer the third

shift because classes begin with a sufficient number of

students, but a few months later some classes have to be

closed for lack of attendance.

A philosophy teacher, referring to the communication

gap, said:

> ... in certain areas I think [there is one], but
> at the same time industry mistrusts the quality
> of education received in technical/professional
> schools.... I think industry should get involved
> in educational activities only _when solicited,_
> and they should not prepare activities. In
> principle I think partnerships can contribute
> positively to social advancement and better
> occupational choice, although I see that the
> implementation of extra-curricular and
> complementary vocational activities is difficult
> in the present secondary school model,
> overcrowded with students who have excessive
> course loads.

The Portuguese data clearly reflect a conceptual

barrier between schools and industry, based on the specific

interests of schools and industry, disregarding the basic

and fundamental educational changes of the 1986 reform.

Although the perceptions reflect the views of educators and

corporate leaders working in the Porto (Vila Nova de Gaia,

Santo Tirso, Vila Nova do Conde, etc.) and Lisbon (Setubal,

Sines, Torres Vedras, etc.) regions, all regions in the
country have technical/professional programs (about 40, for
the 1991/92 school year) and professional schools (about
65, for the 1991/92 school year), while some have
established partnerships with the industries in the region.
It is also clear that the centralized educational system
has not encouraged teachers or administrators to reach out
to the industrial community for the technological help
needed in the present and future preparation of students.

The respondents in the United States indicated that
partnerships can be helpful to education, although the
goals of educational partnerships need to be clearly stated
to help both institutions, industry and schools. An
American technical/vocational school coordinator indicated
that:

> Ongoing communication has been inspired for
> decades by city collaborators and partnerships
> between schools and industry, because it always
> has been viewed as an area of concern...
> Partnerships, historically in the first year of
> the program there is lots of activity, direction
> and motivation. The following year it becomes
> less motivated... they hire people, since their
> commitment was to bring employees from all
> levels of cultural and ethnic minorities into the
> corporation through the program. The need is
> gone and in most of the cases they will say, in
> fact we cannot continue the program. Any
> internship program that will last more than
> three years is exceptional, because in fact
> there is always something changing, either you
> have an administration, financial or budget

> change... help from industry should include
> financial cost sharing, collaborate work
> internship agreements, technical consultation
> and political support... because the school's
> overall mission when jointly prepared with
> industry is essential for long term success.

A corporate leader indicated that there definitely

exists a communication gap between schools and industry.

She thinks that students need a good sound educational

background that has a lot of core subjects. She also

thinks that we need to give students some practical sense

of the work world and where they are going to fit in,

exposing them to different fields as they go along, and

that we need to combine the academic and technical sides of

education. Students need a broader view about what happens

in business and what is the research and development

organization, so that these students also have an

opportunity to see beyond one limited application. In

general she does not see corporations opening their doors

to students with the purpose of using their labs. "I am

sure," she said, that

> ... it depends a lot on the corporation's push
> and support for education, the value that people
> in management see in pursuing and encouraging that
> type of things, and the willingness on the part
> of the management to accept the financial burden
> of doing things like that. So, I do not know how
> widespread this is. It is an ideal situation, but
> how many companies will buy into it and will

promote those types of things, is just
questionable.

A technical staff manager of an engineering

corporation also indicated that

> ... if you are going to prepare youngsters for
> technological demands, they have to have good
> writing and reading skills. The basics have to
> be stressed, because they are going to face the
> difficult technological aspects of industry and
> without good reading and writing skills it is
> hard for them to keep up with technology, get the
> job done in time and make a profit. I do think
> that developing partnerships with schools and
> industry would be great, because schools would be
> in real time with industry in terms of what is
> happening, and schools could be providing
> industry with better qualified students.

An executive director of a school of technical arts

said this about the communication gap:

> Yes! A gap exists, and American industry is
> suffering because we are not getting skilled
> workers. We could import the German model but for
> several reasons we should not. First of all [in
> Germany/Japan] industry completely controls the
> system, there are a lot of problems with that. I
> have problems with that. Secondly people get life-
> time jobs in Germany and Japan. If you could get
> life-time jobs, maybe we could let industry
> control the people... Industry [in America] does
> not provide high wages for high school jobs and
> yet wants schools to provide skilled workers, with
> high computation and communication skills capable
> of adapting to the rapidly changing world. They
> do not need narrow skilled training, but
> vocational education up to this moment has been
> defined as production-oriented, and industry
> through apprenticeship programs and unions has

been working on the "old boy network," ignoring
the future worker.... What happens when industry,
which is the core of the tax base, leaves?
Probably nothing, because the funding core of
public education, over 70 percent, comes from
local property taxes.... In the past, what
apprenticeship really meant was nepotism and
cronies. It was basically jobs for friends, jobs
for friends of friends, and frequently
apprenticeships meant lifting and sweeping, which
are demeaning work. What we need to see is an
integrated workplace with school-based learning.
The workplace needs to understand the issues of
adolescent development, because children are the
fine thread between the workplace and the school,
which are very different cultures.

Reflecting on the role of partnerships, he said:

Actually if partnerships were developed you would
probably minimize the learning gap, by having
industry consistently report that schools need to
basically teach kids academics or as somebody
recently said, "vocademics." Academics within a
real context, like vocational education provides
for what should be interdisciplinary. What is
learned in the work, what is learned in school,
would be closer to what happens in work because
the workplace is becoming more interdisciplinary,
and if people are intellectually honest about this
analysis I think that really works. I have hope
for partnerships and I have a suspicion and fear
for partnerships. But I think that the
introduction of the outside element into the school
can only help, because the ways things happen in
school are relatively unreal, and the ways things
happen outside are relatively real.

A social studies teacher addressed the question of

partnerships, and the communication gap and industry

participation in education with these responses.

Industry has stated over and over again that what we are looking for is well rounded, well educated, <u>not</u> <u>trained</u> young people. We can train them for what we need them for, if you first teach them how to think. Taking a young person at the age of 14 and saying I am going to teach you how to be an electrician, and thinking that really takes three years of high school training to give them the amount of skills necessary to go out and get a job, is ludicrous. Because if in fact industry wants specific technical skills, then they can train an qualified, intelligent, well prepared young person to get the skill.

About partnerships he said:

I think the key to partnerships is to go into areas where their is high unemployment, because my idea of partnership is that people should put their money where their mouth is in terms of further training and further education, particularly in the lower socio-economic areas where there just seems to be no incentive for a kid to do well in school.

An high school administrator said:

There is a definite communication gap between the school and the various components of society, including the business community. This gap, however, is closing. There is a heightened awareness that the needs of society will be better served when schools and industry combine their resources and efforts to produce citizens more attuned to a world in constant and rapid change. We can no longer afford to maintain a social organization based on the independence and separateness of its components.

This respondent then indicated forms in which industry could help vocational education:

a) Offering the factory as a lab for the school;
b) Creating internships for teachers and students;
c) Promoting the development of schools and programs that meet the needs of industry; and
d) Lobbying with government for targeting educational funds to specific programs.

He encouraged partnerships by saying:

Partnerships can be the first step toward the development of solutions to the issues outlined above. Partnerships offer one of the best vehicles for schools and industry to learn about each other, and to learn how to plan together. From this initial stage then one could envisage a society where the two, jointly with many others, would form a well structured, focused, and effective organization.

The English/writing teacher said there is a communication gap between schools and industry, because industry personnel rarely visit schools to actually see what is going on, and school personnel (teachers especially) rarely visit industrial sites. School and industry are only beginning to see education as a joint responsibility. This teacher also feels that establishing cooperative partnerships, where the academics are directly related to hands-on experience, is a good way for industry to help vocational education to prepare young people for the technological demands of the future.

This teacher supports partnerships, saying that these should be true partnerships, with educational and corporate

personnel working in teams. Teachers and corporate
personnel have much to learn from each other. He also
described the partnership program between Polaroid
Corporation and Cambridge Rindge and Latin School/Rindge
School of Technical Arts (CRLS/RSTA), and his role as an
English teacher.

> Students from CRLS/RSTA go to Polaroid every
> day and work in the building maintenance shops.
> That includes electrical, plumbing, carpentry,
> instrumentation, multi-crafts, computer data
> entry, heating and ventilation, and air
> conditioning. These students work there for two
> and a half hours, hands-on, under the supervision
> of both the shop supervisor for the area that they
> are in, plus they work with one of the journeymen,
> one of the tradesmen. So they do that for two and
> a half hours and then for an hour and a half they
> have a luncheon seminar with me, and that counts
> for English and social studies credits. Basically
> the concept is that the shop experience is the text
> for the course. We do a lot of writing about what
> is going on in their hands-on experience and they
> are required to make oral presentations both to the
> class and to an outside group about what they are
> doing in the program, and they also put out a
> newsletter. We also have had numerous lectures
> from the various shop personnel and other people
> in the other areas of the corporation, such as
> administration and finance, fire safety, security,
> mail room.   Every conceivable part of the
> Polaroid operation, they have come to talk to us.
> To tell us what their division is like, what their
> jobs are like and how they got to be where they are.
> So there is a lot of career education going on
> too. Students develop a resume that they can
> take out as they go for employment and/or college
> admissions.

This teacher indicated another important aspect of the Polaroid program: "... they are paid for this. They are paid at Polaroid entry level, which is $7.79 per hour for both the interns, the hands-on and the academic seminar. So they get four hours pay a day for doing this program." He thinks that one of the problems that we are looking at in education these days is "our kids spending so much time working at part time jobs, they don't have enough time for homework. In this struggle, the small income provided by Polaroid will help a couple of kids with that issue."

An electrician/technical teacher said:

> Communication gaps certainly do exist between school and industry. I think this has happened because they have never really tried to get together; this situation seems to be changing for the better recently.

He indicated that industry can help vocational education to prepare young people for the technological demands of the future by sending some of the experts into the classrooms to aid vocational educators and by providing some type of cooperative (learning-working) experiences for as many students as possible.

A special needs teacher also indicated that partnerships between corporations and schools would most definitely minimize the learning gap between school and the

world of work. These partnerships could strengthen the quality of education that students receive, by helping to make the high school education better match the needs of industry. This would facilitate students' achievement in school and after graduation. She said the ways industry can help technical education are:

a) Provide direct, on-site, within high school education to staff in overall and specific vocational areas;
b) Provide direct, on-site, within high school education to students in vocational areas;
c) Provide school/industry sponsored employment to students; and
d) Provide industry financial support to vocational education programs at the high school and higher education levels.

A CAD/drafting teacher, referring to the communication gap, said:

Yes, but I feel that strides are currently being made to bridge this gap. Industry is obviously becoming more keenly aware that it has a shared investment in guaranteeing the success of public education. However, the educational community should avoid at all costs the danger of usurping its own responsibility and perceiving private industry as the salvation of a failing educational system. True progress can only be made with clear delineation of roles and responsibilities, and mutual understanding.

As far as industry providing technological help for future demands, the interviewee indicated that the high cost of

vocational education is a paramount issue. Today, he said,
it becomes next to impossible for school systems to
maintain parity with the demands of rapid changing
technology for more than a short period of time. But
ironically, throwing money at the problem is not always the
best solution if the identified needs are of a more
philosophical or programmatic nature. This is where
private industry can be of significant assistance.
Personnel in private industry should be encouraged to
participate on advisory committees to assist curriculum and
program developers to articulate relevant goals. They
could also serve as mentors, and role models, by becoming
directly involved in activities both within and outside of
the classroom. Equipment donations (or even loans),
otherwise unaffordable to most schools, greatly enhance the
ability to provide state-of-the-art training. They can
also provide technical assistance, and even training for
teachers whose educational goals are complicated by
obsolete, changing or emerging technologies and practices.

Referring to partnerships, the CAD/drafting teacher
said:

> Corporations are rich in resources and
> expertise and are better equipped to define
> their own needs. Given that, it becomes
> incumbent upon the private sector to develop
> fiscal strategies to survive in an economically

competitive society. A shared vision, especially
during times of major change, would provide the
educational community with guidance and
direction in meeting the imposition of current
and future demands.

He indicated also that partnerships should include

representation from institutions of higher learning,

chambers of commerce, community leaders and organizations

with vested interests in the goals and outcomes of

education. Partnerships also afford a broader concept of

reality on a more global scale to what transpires in the

classroom and its relationship to becoming productive,

contributing members of society.

A director of a multinational corporation indicated

that the communication gap is getting smaller and smaller.

He described the information sharing and dialogue of

current ideas, talking with one another and sharing and

living in each other's worlds. These factors are more

likely to define accurately and faithfully the

communication needed between industry and education.

    Successful partnerships are those which have
begun with and stayed with the idea that the
primary contribution is the dialogue between
equals, but in many ways public education is poor
compared to others, and that is what partnerships
are really about. If we can offer training
opportunities because we have little universities
within our corporations that train our own people
in how to manage other human beings, or how to

plan a budget, or how to use a computer to do
Lotus 1-2-3, and we have that training
available to our own employees for professional
and personal development, and we can make that
available to educators who can come and along
with adults in business avail themselves of these
training opportunities, that is an example of
partnership. Sitting down with members of the
school administration and jointly working on a
long-range plan, a five-year plan which is a
shared vision, using the expertise that business
has in planning, and to be at the table as an
equal participant, that is where the value of
partnerships comes from in my view. That is the
greatest leverage.

Both the Portuguese and the American interviewees

expressed a range of perceptions regarding the

communication gap, technological support and partnerships

between schools and industry. Their perceptions were very

comparable, with similarities reflected in most of the main

issues. The Portuguese educators see the need for

communication with industry, but they tend to think that

industry should not participate directly in curricular

development or in the school management process, only if

called for. On the other hand, the corporate

administrators and engineers see a need for direct

participation in the educational process like their

counterparts in the United States.

The position taken by the Portuguese educators

reflects the centralized educational system in which the

state provides for all the educational needs in the country, and does not encourage individual schools to look for other alternatives for funding or creating new and more advanced technological program, of which industry could be a major source of technology and funding.

The American educators and corporate leaders welcome reciprocal participation, although on the partnership question a certain skepticism exists on both sides. The majority of educators see in partnerships a good alternative to modernization of their labs and a unique opportunity for students to see the real world of work. But for some, partnerships mainly perpetuate programs that existed before, in which industry will fulfill its own needs and then discontinue the technology and in some cases the funding. At the same time some corporate leaders do not trust vocational public education as an agent to carry on the demands and needs of industry, because they perceive writing, reading and computation as more important than trade skills. They can provide skill training to any young person who has reading, writing and computing skills.

For the Portuguese group, partnerships are something new and very embryonic, which educators see as a good idea. Because students are overloaded with required courses, they do not see how students can participate in these

activities, which they perceive as extracurricular.
Although the educational reform calls for partnerships, the
educators do not understand the implementation process very
well. The concept is well accepted, and has a very good
start in the professional schools which were developed for
that purpose, but it is still unclear for technical/
professional programs, and almost unacceptable in the
restricted academic programs, which are designed for
college oriented students. Corporate leaders, technicians
and engineers see the need for partnerships and are willing
to be part of the development process, because they see the
lack of practical work experience when students leave
school.

Informated Management and Educational Computerization

The third question I asked my respondents was about
the computerized or "informated" management approach used
by some corporations and its applicability to schools.
Since it is a form of management that could be adapted by
school systems to minimize power struggles between
administrators and staff, and also could help with the
interchange of curricula among different countries, the
answers were mixed. For instance, an CAD/drafting teacher
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answers were mixed. For instance, an CAD/drafting teacher
said:

I can envision an informated educational
system that deals not only with curricular issues,
but also with differing educational philosophies,
methodologies, similarities and differences in
structure, social and cultural issues, and, yes,
even management.

A director of a multinational corporation believes

that the best functioning organizations are those in which

information--all information--is commonly shared and

understood, so people at the top have the same information

as the people on the bottom. A special needs teacher

indicated that a computerized educational system would

definitely help with the interchange of curriculum among

countries.

It would be possible to initiate and
incorporate appropriate and already successful
programs without having to "re-invent the wheel."
Modification and expansion of programs could be
accomplished in a timely manner with efficient
communication among various countries. The
quality of education for all the students
affected would be increased.

An English teacher indicated that he prefers the human

approach, saying:

The solution to management is teamwork and
mutual accountability: therefore, I suppose I
would favor a human relations approach over a
computerized approach. [on the other hand]... a
computerized communication system could stimulate
the exchange of information. The exchange of
curriculum might be useful to educators; direct

person-to-person communication would be more
useful to students. Students need to know how to
manipulate computerized systems.

A high school administrator started out by saying:

> I do not. Computerized systems can indeed
> make information more readily available, and one
> could surmise that such a situation would foster
> better understanding between management and staff.
> Information by itself, however, does not
> necessarily lead to more democratic forms of
> existence. First of all, information is a very
> fragile commodity, easy to manipulate, and passive
> to different interpretations. Better relations
> between management and staff will occur when a
> different understanding of the human and corporate
> relationships takes place. Only when people
> resolve the conflict between their perceptions of
> power, as power over or power with, and come to a
> more comprehensive definition of the human
> enterprise will relations improve.

When asked about computerized interchanges he said:

> Definitely. Curricular exchanges and
> interchanges will indubitably lead to more
> equitable and comparable forms of education, thus
> slowly narrowing the gap between the developed
> and the undeveloped world. One should not,
> however, forget the human element. It is the
> exchange of people between systems that will make
> the real difference. Mechanized systems per se
> will not lead very far. They add and enhance
> human experience, but they cannot replace it.

A social studies teacher said:

> If you want to minimize the power struggle,
> minimize the _power_. All administrators should be
> limited by a term of 3 to 5 years in office, be

paid a teacher's salary plus a small stipend, and all should continue to maintain at least two periods a day of classroom teaching. This way no one would develop a fiefdom and make decisions that help maintain fiefdoms. In this way teachers would be the decision-makers. This model would include all administrators including principals.

A coordinator of a school technical program said:

I think the total resolution of management comes between those who manage and those who are expected to work by managers. I do not really think that an automated managerial approach will do it; there is a human aspect that might be missing if we adopted that approach.

A corporate administrator said:

... as a former teacher I certainly think that it would be very helpful to have an informated system of management. Teachers are very bright and very much hands-on with students and I think that they do not want to be told by administrators just what to do all the time. When they are in the classroom they know the need better than somebody who is removed from the classroom for x number of years, as they pursue the administrative track. I do think as well that it would be very interesting to give teachers and other educators more direct access to information. Especially with all the discussion about educational reform that we are seeing in this country, an informated system will help to learn about what is happening in other countries besides Germany or Japan.

The Portuguese respondents did not see a need for an informated management approach, because they have a very democratic administrative process in which all

administrators of the directive council, as well as of the

pedagogical council, are teachers directly elected by the

faculty, parents and students.   For example a philosophy

teacher explained:

> The educational management structure is
> democratic, and we elect our own administration.
> The major limitations of an administrative
> directive council are based on lack of funds to
> develop activities beyond the institutionalized
> routine. Inclusively, the control of school funds
> is supervised by the pedagogical council that has
> a consulting and advisory power on these matters,
> and it will be good if it does not change much.

She highly recommends computerization, but indicates that

computerization has been slow and primarily oriented

towards the administrative services and offices that were

very bureaucratic and slow. She added that computerization

is an extraordinary and rich means of educational

development, given its numerous applications.

A chemical engineer/teacher said:

> Computerization it inevitable. The computer
> leads towards individualized instruction, which
> will develop a heterogeneous classroom where each
> student can learn at his own pace.

A director of the multinational corporation indicated

that in Portugal computerization in schools is limited to

the administration, and still very underused in all the

secondary schools, including the technical/professional.

At the same time he indicated that schools are not

connected to industry, to benefit and to help in the

computerization process. An academic teacher from Porto

indicated that until very recently the computer was a

threat to jobs and to the bureaucratic administrative

power. He said,

> I think that computerization in any scope is
> always a signal of objectivity, rationalization
> and democratic clearness of power, and in that
> sense it is urgent to pursue the maximum
> dissemination of computerization.

The member of the directive council of the comprehensive

high school in Lisbon indicated as well that school

computerization in Portugal has been very slow, and the

opportunities are still very limited to understand the full

capabilities of a computerized school system. She supports

an interchange of computerization, because "besides

enormous educational applications it also facilitates

communication and analysis of standard data."

Computerization continues to be seen as an excellent

tool for technological and mechanical calculations and

operations but not for the management of human beings.

This at least is the indication from the majority of

participants in this study. For the American interviewees,

including the corporate leaders, the most relevant factor
in management is personal dialogue, understanding of
others, and dependability and accountability, and
computerization counts for a very small part of these
processes. For educators, computers are a learning tool,
which reflects one application of computerization. The
second aspect is the access to management information that
could facilitate planning and budgeting, as well as
curriculum development at the local, national and
international levels.

The Portuguese group is pleased with their democratic
management approach, and they do not see a need for a
computerized administrative system. At the same time they
see the human factor as the major factor in good school
management. They see computers as very good educational
tools, not only for students but for staff as well. The
computerization process is still in its primary stages, but
they would like to see it be expanded and explored to its
maximum capabilities.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

The purpose of this chapter is to discuss the major findings of my study, and to recommend some changes implied by those findings. The analysis of the data gathered during the interviews indicates there are no significant perceptual differences between the various participants in the research, although, based on their personal experiences, they differ in the approaches they suggest to minimizing the problems they see.

The data indicates that in both countries technical/vocational programs have comparable pedagogical, social, technological and professional problems. For example graduates in both countries have insufficient academic background to compete on the job market or in higher education. In both countries the technical/vocational form of education leads into social stratification, and schools are not equipped with the new high-technology equipment to serve the needs of industry, which results in students getting poor technical/professional preparation for work.

The Portuguese participants believe that education contributes a great deal to professional and social mobility, particularly when quality education is provided. Education in Portugal, however, is not accessible to

everyone, due to numerical restrictions imposed through the "numerus clausus" system used by Portuguese universities, which caps the number of college admissions and thus limits access to higher education. Before 1974 a Portuguese student only needed to pass the national examination in order to be admitted to a Portuguese university. Today students have to pass the national examination and also have to compete for a place in college, because universities must operate under laws that control the college admission numbers. There are three levels of stratification, or sifting of the most qualified students. The first is the state examination, which consists of a general examination and a specific examination for an area of science, humanities or economics that the student has chosen as a future major. The second sifting is done by the "numerus clausus," and the third is the very difficult course work given in the first year of college, which discourages many students from continuing.

It is well known that only 16 percent of Portuguese youngsters pursue their education beyond the ninth grade level (Azevedo, 1991). On the other hand the secondary educational system is still very oriented towards tracking, since only students from classical academic programs have a good chance of entering the university. Students coming

from technical/vocational and professional schools have limited opportunities in higher education. If parents can afford the tuition, there are opportunities in the private universities that have flourished all over the country since 1974, but in more quantity and diversity after the 1986 reform. The growth of these private universities is a result of EEC (European Economic Community) funds. Students in these private colleges and universities can have state financial support, which suggests that in the near future higher education may no longer be only a state responsibility, but a private one also.

Although the 1986 educational reform was intended to minimize the socio-educational discrepancies among programs, the reform has not so far accomplished that goal, and educators still see the reform as something that will happen, not that is happening. If education is a priority, then an important question can be raised: How will mobility be insured if the tracking system is not abolished or minimized to the point that all students have the needed preparation, and access to all levels of education?

The "numerus clausus" system needs to be changed, although the quality of university applicants should be preserved through the national admissions examination, which reflects the national standards like the Scholastic

Aptitude Test (SAT) in America. More opportunities for college education need to be given to anyone who intends to pursue it. More secondary and night college programs (continuing education) at all levels need to be developed, to facilitate a part-time educational system capable of serving the social and technological ambitions of evening students (workers or non workers) looking for social and professional advancement. All students at the secondary level need to be exposed for at least one year to technical/vocational courses, which should be offered in single periods, to enrich their knowledge on the world of work, through hands-on work experience. That should provide for a better understanding of the industry and the corporate world that they have to join soon, also helping to de-stigmatize technical/professional education. Moreover students at the junior or senior high school level should have the opportunity to take double periods of technical/vocational education in a specific area of study, connected and related to a university, polytechnical school or corporate partnership program capable of guaranteeing a professional career and/or further education. Students must also complete their required academic course work, which should include the necessary preparation for college admission.

More then ever before Portugal needs specialized
workers to help respond to the industrial, economic and
technological demands of the high-tech industry needed for
its national development. Portuguese industry has to
compete with and survive the impact of competition from
German, English and French industries, starting with the
1992 European union which is even now taking effect.

It is through the development of specialized workers
(technicians) that industry can grow, and it is through
corporate training or school technological training that
commercial and industrial corporations can produce, succeed
and compete on the world market. At all levels, Portuguese
young people as well as mature workers need to update their
technical skills to compete with their counterparts in the
EEC, if Portuguese industries intend to be competitive with
those of other countries within the community.

A major difference between the Portuguese and the
United States technical/vocational education systems is the
lack of any form of the "numerus clausus" process in the
U.S.. Vocational students in the U.S. have state
universities, state community colleges, and technical post-
secondary schools that are affordable to them, although the
private universities are beyond the financial capabilities
of most such students.

Since college admissions in the U.S. are not controlled by a "numerus clausus" system, American students have a better chance to be accepted, and to pursue college education, which can lead to social and professional mobility. Besides that, other recommendations for technical/vocational education that I have indicated for the Portuguese educational system might be applicable to the U.S. technical/vocational education system, since the problems are similar as far as curriculum, working skills, employability and social mobility.

An alternative solution to the problems of vocational/technical education in the U.S. is provided by the 1990 Perkins Act, which outlines specific recommendations to minimize tracking, and encourages socio-economic mobility through its unique approach to learning about all aspects of an industry. With this approach, it moves away from the narrow, skill-based training vision. The act still seems to have different interpretations, not only at the state level, but also at the local level. Up to this point the major problem has been the interpretation of the law, and its direct impact at federal and state levels. In the midst of all this debate, an interpretation of the law will emerge and a pilot/model program will succeed, with a good chance of being adopted by the majority of the states and

schools all over this nation. At present, vocational,
technical and comprehensive high schools are implementing
the act, and several pilot model programs are already being
tested, like "City Works" at the Rindge School of Technical
Arts, at the Cambridge Rindge and Latin School in Cambridge
Massachusetts. In Chicago as part of the National
Vocational Project a community group called Bethel New Life
is working with two local high schools to restructure
vocational education to better meet the needs of the
community. The Philadelphia school system is in the
process of restructuring its division of career and
vocational education to create technical charters in their
comprehensive high school; up to now, however none of these
programs has been recognized nationally. There are no
published reports on these new initiatives, but I have
considerable information on them from personal contact.

A major difference between the Portuguese and American
systems of technical/vocational education rests on the lack
of continuing education programs in Portugal, which limits
the individual promotion of people interested in pursuing
an education. That problem can be minimized with the
creation of more technical and non-technical evening
college programs, offered by state and private
universities. Programs cannot be limited to 2-year

associate degrees, but should be extended to four or five-year programs (bachelor's degrees), as well as masters and doctoral programs.

Portuguese universities also need to look into cooperative educational learning models, forms of partnership with industry, which are used in Europe, especially in Germany, Denmark and France, and also in the U.S.. These would allow students to work, and be trained at a level comparable to other European countries. Students can study for a semester and work on a related field, as indicated and prearranged by the university, in one school semester. The completion of such a bachelor's degree can take twice the regular time, but students can benefit from the direct contact with industry. At the same time they can make some money to pay their school tuition. Moreover, the Portuguese educational establishment should take into consideration cooperative educational approaches used by other European countries, from which international partnerships can be developed. Such approaches, can help in the preparation of engineers, technicians and workers for the present and future high technological demands of the national and E.E.C. markets. In Boston, Northeastern University and the Wentworth Institute of Technology provide examples of this type of education that has been

serving the needs of thousands of day and evening students though cooperative programs.

Suggestions for Minimizing Social Control

This study reflects on the use of technical/vocational education as a means of social control, leading to the class stratification that continues to be part of the stigma associated with this form of teaching and learning. Although all the respondents indicated that this kind of differentiation occurred more during the sixties and seventies, the new models of technical/vocational education in both countries have not yet helped to directly minimize the problem. In my view schools could rise above social stratification if they were to develop an integrated multicultural interdisciplinary curriculum. In implementing it in to explore the potential strategies of cooperative learning in working with heterogeneous groups, they could open up and break the socio-economic and cultural differences among students in the classroom.

Cooperative learning is an old pedagogical methodology that has been successfully used in all types of heterogeneous student populations. It requires training, subject matter knowledge and creativity to develop

materials and interactive activities that will stimulate
curiosity, motivation, cooperative workmanship and
individual responsibility for learning, reinforcing
thinking skills and problem solving. Cooperative learning
increases achievement and improves students' attitudes
toward school, toward learning, and toward classmates,
places the responsibility for learning where it belongs: on
the students, and makes both teaching and learning more
fun (David W. Johnson, 1984, p. 32). Cooperative learning
does not require more financial support than any other
pedagogical approach; rather, it requires trained teachers
willing to work in teams with this methodology that ideally
needs to start in the earlier school years, minimizing
tracking and developing the foundations of cooperative
working skills.

The Portuguese reform does not call for an integrated
multicultural and interdisciplinary curriculum, which is
in fact needed, in order to give students the opportunity
to interact and integrate with all the diverse ethnic
minorities in the country. Out of a population of
10,000.000, Portugal today has approximately 200,000
foreigners living all over the country. These include
people from all of Portugal former colonies: Cape-Verdeans,
Angolans, Mozambicans, etc. all speaking their own

languages and living according to their cultural

traditions, without an appropriate educational support

system to fulfill their basic educational needs. Although

textbooks have pictures and readings about other ethnic

groups, they do not reflect multicultural integration in

the classroom or school.

Similarly in the U.S., the Perkins Act recommends an

interdisciplinary curriculum based on the community's

socio-economic and professional needs, but it does not

address the specific needs of the multicultural,

multilingual and other minorities that represent more than

one-fourth of the student body in the majority of public

schools. This problem needs to be addressed by the state

and local educational systems, to facilitate the social

integration and the technological training that linguistic

minorities need in order to participate in the high-

technology society of the twenty-first century.

On the question of partnerships, and their impact on

education as educators and corporate leaders see it, my

analysis indicates that educators and corporate leaders in

the two countries have different views about partnerships.

Some educators in the U.S. see a need for partnerships as a

way of exposing students more directly to the real world of

work and its professional and technological demands.

Teachers also see the interaction with corporations as a form of personal enrichment, as they gain knowledge from the use of new equipment and techniques used in industry. On the other hand, teachers and secondary school administrators do not see a long-term commitment from industries and corporations to public education. Cooperative and partnership programs between industry and public education have been a secondary priority for industry, and have had a short duration of one budget year or administrative term, according to some educators. Each corporate administration, they say, has its own perception of public education, and its support will depend upon what the leaders think and believe; this has a tremendous impact on long-term school programs that depend upon corporate support, according to school administrators. It is important to point out that corporate leaders see a need for high school graduates to have a solid academic background, and good thinking and problem-solving skills, as well as responsibility and dependability; they do not, however, necessarily need trade skills, because industry prefers to train its employees according to its own standards. The industry prerequisites demand a tremendous preparation from a 17-or-18-year-old youth who in many cases is not mature enough to understand the economic and

industrial world. This also reflects the difficulties that young people between 17 and 22 years of age have in finding jobs in America, which can lead into indifference towards work and social inequality.

The Portuguese perspective on partnerships is characteristic of employees in a centralized public school system in which issues such as budget, facilities maintenance, curriculum, and supplies are completely determined by the Ministry of Education. In a centralized educational system, secondary and higher education have a intrinsic cooperative or partnership relationships that should be totally supported by the educational establishment. Such relationships should automatically be mutually supportive. In such relationships, however, students from the secondary level often do not have direct access to a college education, either through programs pre-designed by the partners or through cooperative commitments between the two state institutions. In Portugal at this time, that commitment is minimal, because the universities and schools of education are not providing schools with the pedagogical support needed to implement the reform.

To change this situation, universities need to be active participants in the educational reform, by helping schools to develop teaching and learning methodologies

which can serve the needs of all students. To understand teachers' needs and to train future teachers, the Portuguese schools of education need to be much more involved in the day-to-day problems of curriculum, management and discipline that schools today have to face. For example, each university professor should serve as a general resource for a class, should serve as an exchange teacher while the classroom teacher makes guest appearances in the professor's undergraduate or graduate classes, and should serve as role model and mentor for students who may be considering a college major and/or a career in the professors's field or in a related field. The professor should also develop any other appropriate cooperative activities with the classroom teacher.

Up to now, the 1986 Portuguese reform has fallen short of its goal of full decentralization, since the government is still the primary source of finance for public education. The basic curriculum is still developed and disseminated by the ministry, and teachers are still being hired and fired only by the ministry of education. This year, for the first time, the regional administrators will have the power to select their own school staff, a change very much to be appreciated.

Because of this financial and curricular dependency on the government, some teachers and school administrators in my sample indicated that cooperation with the higher education agencies and with industry is not a priority, except that they need more equipment and teacher training. This attitude reflects the lack of individual identity among schools, and the lack of creativity to solve the immediate problems in their communities, problems that vary from one region to another according to socio-cultural, economic, technological and industrial needs. The inability to understand the need for partnerships can lead to an even wider split between schools and industry, at a time when cooperation is needed more than ever to restructure the specialized work force so that Portuguese industry can reach the same high technological level as other members of the European Community.

On the other hand, the Portuguese corporate and industrial leaders in my sample do see a need for cooperation in the form of partnerships, because in their view schools cannot keep up with the technological advance of the industrial world. Financially it is not feasible, and schools need corporate help to prepare graduates who can enter the job market already trained in the fundamentals of the computerized technological

processes and equipment used today. The Fundação Ricardo Espirito Santo and the Instituto Nacional de Engenharia e Computadores (INESC), which work in a partnership format with 35 enterprises and 5 universities, and each year train about 3,000 young people in professional and trade-related occupations, are good examples of school/industry cooperation.

It can be said that the educational and corporate establishments do not see partnerships as a significant solution to the problems that education faces today. Their perceptions reflect a mutual mistrust. According to some Portuguese and American educators in the study, schools and industry have two different missions at the secondary level: secondary schools should provide a well-rounded education to all students with no preconceived notions of tracking, and industry should help schools to accomplish that mission--without predetermining the outcome--in the form of employment skills geared to their specific needs.

The U.S. schools have tried hard to prepare students to go out into the world and succeed, in spite of their financial problems. Moreover, schools have struggled with the political problems of large patronizing administrations without leadership skills. Schools have been understaffed, working with limited supplies, with very large

heterogeneous student bodies, including linguistic minorities and students with special needs, who require individual attention and special teaching skills, with only minimal federal and state help. In the U.S. teachers welcome all types of support from industry, community and especially parents, because without parents the educational chain is not extended to the home, where support and understanding for education, discipline and commitment to learn should be cultivated.

I do believe that partnerships can be effective at the secondary level if corporations and schools engage in long-term commitments, and definitive goals are set to serve the needs of the two parties. At the college level, partnerships can be highly recommended, since students at that level are much more mature, and capable of taking on the responsibility and commitment to a career, benefitting directly from the technological or financial support of a corporation.

The Computer and Informated Management

The last major question in this study was the value of a computerized (informated) management approach and the use of computers as a tool. The respondents in both countries were divided in their responses to this question. Some

school and corporate administrators in the United States do not see an informated management style as a solution to managerial problems. They see management as a dialogue between human beings in which accountability, dependability, and responsibility are the key elements. In their view, the computer is a vehicle for data collection and manipulation, one that opens up lines of communication and gives direct access to information, while also being a vital tool to process and develop new technology. On the other hand, some teachers see an informated management approach as a form of access to budgetary decision making, through direct access to administrative information that can directly affect their lives. They see computers as tools for teaching and learning, and for developing curriculum. Through computers all school faculty can have access to innovative national pedagogical developments and information relevant to teaching, counseling, and management.

Teachers, school administrators, and corporate administrators in my sample do see a need to computerize the school curriculum, not only at the local level, but at the national and international levels as well, in order to bridge the gap between educational systems working with different pedagogical approaches. They highly recommend

the use of computers as a tool for teaching and learning
since technological advancements in the world demand a
society prepared to face these technologies in their day-
to-day encounters, demanding from schools the preparation
of present and future generations.

The Portuguese group of teachers, school and corporate
administrators in my sample also do not see a need for an
informated management approach, because Portuguese schools
have a democratic administrative system in which teachers,
parents, corporate leaders and students elect teachers to
be their administrators for two school years, serving on
the administrative and pedagogical councils. The 1986
reform provides for school principals to be elected within
the administrative council, to work with the administrative
and pedagogical councils and officially represent the
school in formal and private appearances, which some
schools are starting to do.

Corporations also have a democratic administration in
which the different groups within the corporation are
represented. All the Portuguese respondents recognize a
definite need for school computerization at the
informational and curricular levels, because educational
computerization in Portugal is still very limited. Some
corporate leaders recommended that schools look into the

possibility of partnerships as a way to expedite and expand
the process of educational computerization. It is
striking how worried the Portuguese corporate leaders are
about technological education, a concern which is not
reflected by the educators there.

I do see computerization as vital to the economic
development of Portugal, and to its relations with other
European countries within the EEC. Partnerships at the
international level are essential to the technological
development of the country, but they can only be
established through an educational system open to change,
and receptive to new forms of teaching and learning,
capable of bridging the gap between an old industrialized
economic system and the new world of high technology.

Nor is school computerization fully a reality in the
United States. Not all American schools have computers,
and not all classrooms have computers in them.
Computerization needs to be part of every school today, to
better prepare young people for all their future needs.
The majority of affluent public schools in the country are
computerized, but the less affluent and less powerful
communities are still looking for their first computer
system. In this context computerization can also be seen
as a new means of social stratification.

Implications for Further Research

Future studies could use the methodology developed in this study to further analyze the contributions of the 1986 Portuguese reform and the 1990 Perkins Act. How do these laws contribute to socio-professional mobility through their goal of minimizing socio-economic and professional stratification? The role of partnerships in both countries, but especially in Portugal, should be relevant to future studies, since its membership in the European Economic Community will require economic, industrial and educational cooperation with other EEC countries, demanding an overall restructuring of their perception of partnerships.

In the age of high technology, every day something new is introduced in the market that will have a tremendous influence not only on industry but also on education, requiring analysis of its implications for teaching and learning. Since computerization will play a major role in our lives from primary school to retirement, it should be relevant to study its function as a means of social stratification as well as its potential for social integration in the next century.

It is through research that the innovative educational methodologies are analyzed and compared. I highly recommend further studies in all the issues I have examined, whether socio-educational or historical, as well as problems of computerization and partnerships, to address the lack of updated resources needed for a good understanding of educational development, and its relation to the world of work.

The limitations of this study (the knowledge and perceptions of the group of individuals chosen) could also be corrected in other studies. A larger sample size would allow for a better understanding of the two educational systems. Sampling leaders from more regions in both countries would also enlarge the perceptual dimensions of the study, leading towards a more national understanding of the problems considered.

It is hoped that the methodology and the results of this study can help bring about a better understanding of technical/vocational education among educators and corporate leaders in the two countries, which have been trying to address nearly identical problems although in different socio-political and economical contexts. It is also hoped that this study will stimulate more comparative research between countries and educational systems.

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