

## PROGRAM OF INNOVATION IN TRAINING IN TECHNICAL SKILLS

(TC-95-06-34-8)

### EXECUTIVE SUMMARY

**NAME OF PROJECT:** Program for innovation in training in technical skills

**MIF FACILITY:** Human Resources Facility (II)

**BENEFICIARIES AND EXECUTING AGENCIES:** Centro de Investigación y Desarrollo de la Educación [Center for Research and Development of Education] (CIDE), Fundación Educación Empresa [Foundation for Business Education] and Fundación Andes [Andes Foundation] as co-executing agencies.

**FINAL BENEFICIARIES:** The final beneficiaries by project will be: (i) approximately 5,250 students in 10 technical and vocational schools (new curricula adaptation project); (ii) approximately 10,275 students (business education project); and (iii) the users of the country's education system and the university and production sectors (technical assistance project for improvement of the teaching of mathematics and sciences).

**OBJECTIVES:** The main objective of the program is to improve the teaching of technical and business skills in the secondary-level education system, specifically in technical and vocational education, by means of three demonstration projects with replicability both in the country and in the region and which enjoy the support of the private sector. The results of the program will be seen in higher levels of technical skills and know-how requiring applied knowledge of mathematics and sciences and entrepreneurial capacity having an impact on the productivity of human capital in the medium term in the country.

An important byproduct of this operation will be the results obtained from a pilot project, which could be of great value for replication in other countries of the region.

**DESCRIPTION:** The project for adaptation of new curricula for secondary technical and vocational education (US\$1,999,000) executed by the CIDE applies a curriculum innovation developed by the Center for Occupational Research and Development (CORD), of the

United States, in 10 secondary-level technical and vocational schools in Chile, involving approximately 150 courses in mathematics, introduction to technology and applied biology and chemistry.

The business education project (US\$595,750) to be executed by the Fundación Educación Empresa [Foundation for Business Education], adapts the *Junior Achievement* business education programs to the Chilean context. Specifically, the project will: (i) extend the business education program to three regions of the country, decentralizing its management and adding instructors from the private sector for the regions that do not currently have access to the courses; (ii) implement the courses in the technical and vocational schools of the Sociedad Nacional de Agricultura [National Agricultural Society] (SNA) so as to provide young people from rural areas with an opportunity to develop their business skills; and (iii) design new business education courses that have not yet been included in the Foundation's offerings.

The technical assistance project for a program to improve the teaching of mathematics and sciences (US\$600,750), to be implemented by the Fundación Andes [Andes Foundation], will finance a diagnostic study to identify alternatives that will lead to an improvement in the teaching of the two subjects. On the basis of the study's recommendations, a work program will be selected for steps that can be taken to spur changes in the curricula so that when young people enter the labor market they are capable of critical thinking and possess the analytical skills needed for problem-solving.

**FINANCING:**

| <u>Modality</u>             | <u>Donation</u> |
|-----------------------------|-----------------|
| <b>Beneficiaries:</b>       | US\$1,588,525   |
| CIDE                        | US\$ 989,625    |
| Fundación Educación Empresa | US\$ 298,150    |
| Fundación Andes             | US\$ 300,750    |
| <b>MIF:</b>                 | US\$1,606,975   |
| CIDE                        | US\$1,009,375   |
| Fundación Educación Empresa | US\$ 297,600    |
| Fundación Andes             | US\$ 300,000    |
| <b>Total:</b>               | US\$3,195,500   |

**IMPLEMENTATION  
SCHEDULE:**

Although each of the program projects has an individual implementation schedule, the program as a whole will have a 52-month disbursement period and will be implemented within the first 48 months. The execution periods for each project are: 48 months

for the project for adaptation of new curricula for secondary technical and vocational education; 36 months for the business education project; and 18 months for the technical assistance project for improvement of the teaching of mathematics and science.

**ENVIRONMENTAL  
CLASSIFICATION:**

The Environment Committee, at its meeting of April 16, 1996, classified this as a Category II operation. The environmental brief was sent to the PIC on May 22, 1996.

**SPECIAL  
CONTRACTUAL  
CONDITIONS:**

Conditions precedent to the first disbursement (see paragraph 3.33):

- a. The program coordination unit and its advisory board must be set up and their respective members appointed.
- b. Once the advisory board of the coordination unit has been set up, the parties must enter into an interagency coordination agreement that will ensure proper implementation of the program.

**EXCEPTIONS TO BANK  
POLICY:**

The Center for Occupational Research and Development (CORD) possesses technical and institutional comparative advantages that justify it being contracted directly by the executing agency CIDE (see paragraph 3.7, 3.8 and 3.9) instead of following the competitive bidding procedure. CORD is a nonprofit public-service organization devoted to the promotion of technical education and of contextual learning. Considered a leader in the technical education field, CORD was set up by various states in the United States which allocated it funds to develop "school to work" curriculum models. The design of the CORD materials focuses on applications in the workplace, developing standardized occupational skills for the Departments of Education and Labor, which define specifically what students must know and be capable of doing in the different technical areas. Recently, with funds from the World Bank and the United States Agency for International Development, together with financing from the governments concerned, CORD has been participating in significant education reform initiatives in Canada, Turkey, Mexico and Malaysia.

## I. COUNTRY ELIGIBILITY

- 1.1 On October 6, 1993, the Donors Committee declared the Republic of Chile eligible for all types of financing provided for under the Multilateral Investment Fund (MIF).

## II. BACKGROUND

- A. Human resource training in Chile: opening up and expansion of the economy
- 2.1 During the 1970s and 1980s Chile completed the most difficult stages of the modernization of its economy. Its gross domestic product (GDP), which in 1982 had dropped to -14.1%, averaged over 6% between 1990 and 1995. As a result, unemployment, which in 1982 stood at 19.6%, fell to 5.9% by 1994. Poverty also diminished, and while a total of 5.4 million persons (44.6% of the population) were classified as poor and extremely poor in 1987, this figure was down to 4.36 million or 32.7% by 1992. Rating agencies have recognized this good performance of the Chilean economy, which they rate as low risk.
- 2.2 However, the economy's exemplary performance has not been reflected in education, the low quality of which is a strategic weakness of the country. This assessment is corroborated by the annual quality measurements made by the education authorities. The most recent (1993) quality measurements in primary education indicate that students' average performance in the national language is barely 58.9% of the objectives, and in mathematics only 56.3%.
- 2.3 In secondary education, the situation is even more disturbing, with student performance in mathematics only 46% of that targeted in 1994, and a mere 33.4% in the low-income population. In addition, there are internal efficiency problems, with dropout rates ranging between 7% and 11.7% per year and repetition rates of some 12.3% per year. Coverage dropped from 81.8% in 1988 to 76.2% in 1992, with a slow recovery thereafter, bringing the percentage back up to the levels achieved in 1988.
- 2.4 One of the features that affects the quality of secondary education most directly, and particularly that which is provided to the low-income population, is the lack of relevance of the curricula. The content of the education derives from plans and programs drawn up in the 1960s and – although they were updated 11 years ago – recent research shows that students are utterly put off by the academic approach. The subjects are taught in a repetitive manner requiring rote learning; the teachers use dictation as their main method; the courses in the core curriculum, which include the mathematical, scientific and cultural bases of the technologies, have no

relationship with the technical courses or specialties. The students thus fail to perceive their relevance or application in the working world. Moreover, workshops and laboratories are hardly ever used.

- 2.5 From a production standpoint, human resource training is a critical factor. The fact is that employers today are complaining that young people do not have the basic knowledge of mathematics, science and language they need to work in modern enterprises, that they do not know how to learn, lack creativity and the ability to work as part of a team and, in general, display no sense of responsibility.
- 2.6 To address this situation, the present government, acting on a consensus of society as a whole, plans to increase the 4.5% of GDP allocated to education in 1995 to some 7% by the year 2001. Three mechanisms have been set up for this purpose: (i) Law 19247 enables businesses to allocate up to 2% of their profits to support subsidized schools, in exchange for tax credits equivalent to 50% of their payments during the next fiscal year; (ii) this law also authorizes State-subsidized schools (private or municipal) to charge fees, the proceeds from which can be used for investments, innovations and incentives for teachers; and (iii) on the basis of a policy proposal agreed on with the opposition, the Chilean government has decided to use the funds received from privatization of enterprises for investments in education, the resources in question being estimated at around US\$1.2 billion (the copper mines and smelting works are not included).
- 2.7 Other public funds are also earmarked for education investments, the largest contributions being the national funds for regional development, which are reported to have allocated some US\$42 million to the sector in 1995.
- 2.8 One of the most interesting features of the process of allocating investment resources to education in Chile is that the largest sums are allocated to projects prepared by the subsidized schools themselves or by the municipalities to which they belong. Similarly, the contributions made by businesses are required by law to finance education projects in the schools.

B. Program for improving the quality and equity of secondary education: decentralization and privatization of services

- 2.9 The Program for Improvement of the Quality and Equity of Primary Education (MECE) and the companion program for secondary education which the Ministry of Education has been implementing since 1991 and 1995, respectively, are designed to raise the academic performance of all students, especially those from low-income groups. However, unlike previous reforms in which the ministry itself was the key player, the new programs propose to upgrade quality by deepening decentralization. Accordingly, the actions to

introduce change do not come from the central level, which only creates the conditions for change to take place. The innovations have to originate from the secondary schools themselves, supported by universities and independent academic centers, the community and private businesses.

2.10 The MECE program for secondary schools calls for the following activities:

- a. Calls for bids will be issued for the design and production of free textbooks for all students at subsidized schools, and teachers' manuals.
- b. Resources will be provided to enable the schools to develop their capacity to design innovative actions by hiring the services of private curriculum development institutions. To this end, private or university centers will apply to be entered in a national register and the secondary schools will hire their services, which will be paid for under the MECE program.
- c. Resources will be provided to enable the schools to purchase the teaching materials required by the innovations they introduce. In this case, the Ministry of Education will prepare a list of materials, including all materials suggested by the sector enterprises and which the ministry has classified as being "of educational value," from which the schools will select the ones they consider necessary.
- d. Computers will be provided to all the schools and connected to the network.

2.11 The MECE program for secondary schools does not include centralized preparation of any curriculum proposal designed to improve student academic performance or any teacher training, but instead proposes training of professional working groups in each school. On the contrary, the underlying assumption of the program is that the universities and academic or curriculum-development centers in Chile have the institutional capacity needed to support the innovations required to upgrade the quality of education.

2.12 In sum, the MECE secondary program offers excellent conditions for establishing permanent mechanisms for support and collaboration between the schools and the private sector. Moreover, establishing such ties can be considered one of the prerequisites for improving quality and equity in human resource training in Chile. In fact, unlike the other Southern Cone countries, only 10% of Chilean young people go on to university, and this percentage declined further during the 1980s. Clearly, young people of pre-university age (between 15 and 18 years) constitute a key group entering the labor market in Chile.

C. Rationale of the program

- 2.13 Given the level of economic development achieved by Chile, human resource training should offer all young people a quality general education based on their individual learning abilities and the competitive skills necessary to be able to participate actively in the free-market economic system. The private sector has therefore played an active part in the national dialogue on the need for a highly competitive labor force. Private-sector business organizations, educational institutions and nongovernmental organizations have identified various activities for promoting the reform agenda. These include establishment and promotion of education standards linked with the needs of the productive sector, the direct supply of education programs geared towards the working world, curriculum reform and participation by the private sector in its financing.
- 2.14 One example of this effort is the number of foundations and NGOs that are promoting curriculum innovation and quality education in the areas of mathematics, science and business skills, with specific emphasis on industry demand for these skills. The group made up of the CIDE, the Fundación Educación Empresa and the Fundación Andes 1/, which will receive the resources from this operation, belong to this category. Various initiatives have been proposed to the MIF to promote training in technical skills in secondary technical and vocational education.
- 2.15 The experience gained from trying out these innovations in Chile will be of great importance for the Bank and for the region in the conceptualization and design of future projects.

III. THE PROGRAM

A. Objective

- 3.1 The main objective of the program is to improve the teaching of technical and business skills in the secondary school system, particularly in technical and vocational schools, by means of three demonstration projects with replicability aspects both in Chile and in the rest of the region and which are backed by the private sector. The results of this program will be seen in higher levels of technical skills and know-how requiring applied knowledge of mathematics and science and entrepreneurial capacity that will have

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1/ Paragraphs 4.2, 4.3 and 4.4 of chapter IV, Execution of the program, contain greater detail on the background of these organizations and the plan of activities.

an impact on the productivity of the country's human capital in the medium term.

B. Description

3.2 Specifically, the program resources will finance three projects:

1. Project to adapt new curricula for secondary technical and vocational education

3.3 The purpose of this project is to adapt, disseminate and implement innovative curricula designed to improve the learning of mathematics, technology and science (biology and chemistry) by students in secondary technical and vocational schools, under the MECE secondary education program being carried out by the Ministry of Education.

3.4 To accomplish the project's objectives, the activities have been organized into three components: (i) **curriculum adaptation**, which will consist of translation and dissemination of the course models and their adaptation to Chilean cultural characteristics and regulations governing curricula; (ii) **implementation of the curricula**, through which the mechanisms for introducing the new curricula in the schools will be prepared and implemented; and (iii) **monitoring, followup and evaluation**, which will include technical assistance for the teams of teachers in the schools participating in the project, together with preparation of the tests (pre- and post-project) that will make it possible to assess the impact that the new curricula have on the students who attend the courses.

3.5 The project's specific objectives are to: (i) demonstrate that application of the innovation proposed by the Center for Occupational Research and Development (CORD) in the teaching of mathematics, principles of technology and applied biology and chemistry will significantly improve student academic performance in terms of both quantity and quality, compared with that achieved using the conventional secondary education curricula; and (ii) create and support the conditions for organizational, technical and financial sustainability for dissemination of curriculum innovation on a nationwide scale.

3.6 Beneficiaries. The direct beneficiaries of the project will be 10 technical and vocational schools in two regions of the country, where the mathematics and applied science courses will be implemented. An estimated 5,250 students will participate in these courses during the four-year duration of the project.



- 3.7 The program consists of applying the curriculum innovation developed by CORD in the United States. 2/ The courses in which the innovations will be introduced are part of the curriculum referred to as "Tech Prep", which was developed with funding from the United States Department of Education and is designed to provide students with a solid foundation in mathematics, physics, chemistry, biology and communication skills during pre-university education so that the students will perform well in the subjects they choose to specialize in, or else will be successful in subsequent technological careers. CORD was formed to disseminate the innovations developed by different states in the United States; it prepares the teaching materials used and spearheads their implementation.
- 3.8 Unlike traditional technical and vocational education, which is geared towards performance of a particular job, "Tech Prep" focuses on mastery of the sciences and techniques underlying different productive occupations or groups of occupations. The teaching materials used are designed to stimulate group learning, apply to concrete situations in the working world and provide for ongoing experimentation.
- 3.9 In a nutshell, the curriculum innovation proposed by CORD consists of:
- (i) A different orientation. The curriculum is based on the scientific and technological knowledge that underlies a wide range of productive processes. This curriculum, organized by courses, is broken down into learning units known as modules.
  - (ii) A different teaching methodology. In accordance with the foregoing, a methodology is proposed which focuses on problem-solving and teamwork. Use of laboratories is therefore essential.

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2/ In addition to the experience in the USA, this methodology is also being successfully exported to other countries. Mexico and Turkey are experimenting with curriculum changes based on the CORD proposal. In Chile, the CIDE, in conjunction with the Instituto Chileno Norteamericano de Cultura and CORD, started a small project for disseminating the methodology in 1990. The project only had sufficient resources to train a group of Chilean teachers to apply the mathematics curriculum. Twelve of these teachers went to Waco, where they familiarized themselves with the innovation which they then began to apply once they were back in Chile. Despite the lack of resources for systematic application and rigorous evaluation, there are indications that the new curriculum is proving successful.

- (iii) Support system in its application. Both the approach and the methodology are contained in materials for the students and manuals for the teachers.

- 3.10 However, at least three conditions have to be met for a curriculum change to have a permanent impact:
  - a. The innovation must be evaluated and shown to effectively improve the academic performance of the target students.
  - b. The institutional conditions that make the innovations sustainable, i.e., that make it possible for it to be maintained, expanded and improved over time, must be in place.
  - c. Resources must be available to implement the changes.
- 3.11 Use of MIF funds for this project is justified in light of the Chilean economy's needs, the critical situation of secondary education, especially secondary technical and vocational education, for which curriculum innovation is essential if the quality of the education provided at that level is to be improved.
- 3.12 Given the characteristics of secondary education reform to date, which has been furthering of the decentralization process as its chief aim, it cannot be assumed that such innovation will automatically be generated by the schools themselves, the universities or the private sector without stimuli such as those proposed, because of the prevailing inertia and the natural resistance to change. Moreover, development of a national curriculum that would meet the needs of the Chilean productive sector now and in the future would require five to 10 years for development, trial application and refinement, and would entail much higher costs than those required for importing and adapting a curriculum innovation already developed; a pilot project such as the one proposed in this operation is therefore necessary.

- a. Curriculum adaptation component

- 3.13 The purpose of the curriculum adaptation component is to adapt the curricula (which include student textbooks and teachers' manuals) to Chilean cultural characteristics and regulations governing curricula. A CIDE team made up of the project coordinator and a curriculum specialist, backed by CORD technical assistance, will analyze the content of the modules in order to: (i) adapt the content to Chilean culture, and (ii) verify the consistency and sequence of the content in terms of the current plans and programs for secondary technical and vocational education in Chile.

b. Curricula implementation component

- 3.14 Implementation of the curricula. This component will concentrate on preparing and putting into practice the mechanisms for introducing the new curricula into the schools.
- 3.15 The CIDE will select the 10 secondary schools in which the experiment will be applied, according to the following criteria: (i) school administrators: the school administrators must be committed to the work and to the curriculum change involving use of the proposed methodology; (ii) course teachers: the teachers of the mathematics, principles of technology and biology and chemistry courses must support the changes and demonstrate interest in working with the proposed methodology; (iii) status: 60% of the schools must be public municipal schools, and 40%, private schools; (iv) type of establishment: 80% of the schools will be technical and vocational and 20% will be geared towards science and the humanities; (v) specialization: the branch of specialization will be considered in proportion to the number of establishments in each region (Region V and Metropolitan Area), according to the technical and vocational branch; and (vi) poverty targeting: priority will be given to schools serving low-income groups.
- 3.16 As the next step, a detailed study will be conducted in each school of the cost of implementing the new curricula over a four-year period.

This study will determine:

- the funds that will be contributed by the program
- the funds that will be contributed by the school
- the cost of the infrastructure (laboratories)
- the cost of equipment
- the cost of materials
- teacher training needs, and
- the technical assistance requirements.

c. Monitoring, followup and evaluation component

- 3.17 Evaluation and followup. Under this component, pre- and post-project tests will be prepared and administered to assess the differences in academic performance between the students participating in the program and a control group. Cost-effectiveness studies will also be conducted on the innovations and on the feasibility of sustained nationwide dissemination of this innovation in the short, medium and long terms and the amount of

funding available for this purpose. The evaluation plan will include recommendations concerning the transferability and reliability of the mathematics and applied sciences curricula to other countries of the region.

- 3.18 Monitoring. To take care of the day-to-day needs stemming from implementating the curricula and systematizing the data required to prepare the various manuals of procedures that will be produced as a result of the overall process, the CIDE will hire a staff member who will be responsible for relations with the schools and two professional-level assistants.

## 2. Business training project

- 3.19 The purpose of this project is to develop an entrepreneurial spirit and a capacity to take risks and make decisions in young people in technical and vocational schools, by means of business education courses that close the gap between school and the working world, promoting expansion of the private sector in the context of a free-market economy.
- 3.20 Specifically, the project has three objectives: (i) to extend the business education program (*Junior Achievement*) to three regions of the country, decentralizing its administration and adding instructors from the private sector in those regions which do not currently have access to the program; (ii) to implement the courses in the technical and vocational schools of the National Agricultural Society (SNA) so as to provide young people from rural areas with opportunities to develop their business skills; and (iii) to develop new business education courses that have not yet been included in the Fundación Educación Empresa's offerings.
- 3.21 Beneficiaries. The beneficiaries of the project will be approximately 10,275 secondary students from technical and vocational schools, municipal secondary schools and SNA-administered schools, all located in Regions VI, VII and VIII and in the Metropolitan Area, which will be covered in three years, working with 3,245 young people each year.
- 3.22 The project will address the challenge of incorporating business management skills into the secondary students' learning process by adding the *Junior Achievement* courses. This business education program consists of a set of courses based on a module format and containing specific materials to be worked on with the students. Course duration varies from 6 to 18 sessions. Each unit or course has specific objectives and activities which enable the students to "learn by doing" and also includes interdisciplinary activities and others for reinforcement and followup, so that the teachers can continue applying the content of this innovational methodology with other groups and during the rest of the year.

- 3.23 The following criteria were used to select the four regions of the country where the courses will be implemented: (i) existence of businesses interested in providing active support; (ii) the possibility of having counterparts interested in heading up the running of *Junior Achievement* in their region; and (iii) existence of schools administered by the SNA.
- 3.24 The modules that will be implemented cover various skills for developing entrepreneurial, decision-making and problem-solving capacity. Some of these programs have already been used and therefore need minor adaptations for secondary students, while others will have to be revised, translated and adapted from the English. The six courses are:
- a. **Business basics**, an introduction to the free-market economy and the business world, consists of six 45-minute sessions.
  - b. **The benefits of staying in school** is a module which deals with the problem of dropout rates and ways to handle the factors that play the biggest role in the decision as to whether to stay in school. The different activities help the students to understand the importance of education for the quality of their future life and personal development. The course consists of six 45-minute sessions.
  - c. **Personal economy**, a module designed to enable the students to assess their skills and interests, explore the possible career options they have, learn to seek employment and discover the value of education. This course consists of eight to 10 45-minute sessions.
  - d. **Business in action** is a course that helps students to understand the main characteristics of the Chilean economic system and the role that business plays in it. This course runs for eight to 10 45-minute sessions.
  - e. **The partnership** enables young people to participate in an experience that leads them to work as a team and understand how important it is to perform tasks undertaken responsibly and honestly, fulfilling commitments and meeting deadlines. It is a 15-session course, with each session running for two and a half hours.
  - f. **Foreign trade** is a module designed to familiarize young people with the globalization of markets and the challenges of exporting. Students in this course participate in the International Student Forum, an annual five-day conference which includes educational workshops, group discussions with business leaders and activities to develop leadership. This course comprises 18 sessions of two and a half hours each.

3. Technical assistance for a program to improve the teaching of mathematics and sciences

- 3.25 The objective of the program is to upgrade the quality of the education in mathematics and sciences received by future generations of leaders, by means of diagnostic studies on the attitudes and needs of those requiring such training services (private sector, universities, parents and the young people themselves), with a view to identifying alternatives for curriculum innovations that will improve these teaching of these subjects and their dissemination throughout the country.
- 3.26 Beneficiaries. The main beneficiaries of the project would be the Chilean education system and the stakeholders who would be directly affected by the existence of a plan to improve education, such as universities, the productive sector, parents and students.
- 3.27 The project has three stages: (i) diagnosis, for which diagnostic studies will be carried out on demand (interviews with entrepreneurs, university academic staff, parents and young people) and supply (research on the same type of schools in other countries and preparation of a bibliography on the subject); economic and financial diagnostic studies; and preparation of alternatives; (ii) decision-making and selection of alternatives, in which the recommendations from the first stage will be submitted to the project consultative committee and to the Bank for approval and authorization to proceed with the third stage; and (iii) executive report and plan for program implementation, which will identify specific actions, indicate the resources needed and set forth the financial plans.
- 3.28 The diagnostic study will include the following components: survey of demand for differentiated training in mathematics and sciences; academic curriculum alternatives; institutional relations and link with the traditional education system; sizing of needs; identification of equipment and infrastructure; extension activities for dissemination of innovative experiences; institutional framework and decision-making; and implementation mechanisms.
- 3.29 The first stage of the project, the diagnosis, will be based on a set of basic assumptions that will shape its terms of reference:
- a. In the Chilean secondary school system, there is a group of gifted students with above-average intellectual and work capabilities who are ignored by the traditional system.
  - b. Students from families where knowledge is valued but which belong to lower socioeconomic groups are limited in their access to sources of information that would enable them to fully develop their talents.

- c. The most efficient way to develop an analytic and critical mind is by problem-solving. Study of mathematics and science offers an inexhaustible source of problems.
- d. The improvement of education must include a special academic program with a development and training component for the teaching staff. In addition, the activities to be investigated will include the possible functions of a center for dissemination of innovative teaching methodologies with a view to their adoption by the entire school system.
- e. The program for improving education will have to be funded largely by grants from the Chilean private sector and national and international foundations. In addition, the financial diagnostic study will have to identify sources of financing that will remain stable for a period of at least 10 years.

C. Cost and financing

- 3.30 The total cost of the program is estimated at US\$3.19 million; of this total, it is requested that US\$1.6 million be financed with nonreimbursable MIF funds. The program resources will be distributed among the three projects and the coordination unit as follows:

| PROGRAM FOR INNOVATION IN TRAINING<br>IN TECHNICAL SKILLS   | MIF              | LOCAL<br>CONTRIB. | TOTAL            |
|---|------------------|-------------------|------------------|
| Project for adaptation of new curricula for secondary technical and vocational educational (CIDE)                 | 1,009,375        | 989,625           | 1,999,000        |
| Business education project (Foundation for Business Education)  | 297,600          | 298,150           | 595,750          |
| Technical assistance project for a program to improve the teaching of mathematics and sciences (Andes Foundation) | 300,000          | 300,750           | 600,750          |
| <b>TOTAL</b>  | <b>1,606,975</b> | <b>1,588,525</b>  | <b>3,195,500</b> |

- 3.31 A summary of the estimated budget is given below:

| ITEM  | MIF              | LOCAL<br>CONTRIB. | TOTAL<br>(US\$)  |
|---|------------------|-------------------|------------------|
| <b>PROJECT FOR ADAPTATION OF NEW CURRICULA FOR SECONDARY TECHNICAL AND VOCATIONAL EDUCATION</b>       |                  |                   |                  |
| Administration  | 167,500          | 179,000           | 346,500          |
| Curriculum adaptation component   | 64,500           | 64,500            | 129,000          |
| Curriculum implementation component   | 490,625          | 549,375           | 1,040,000        |
| Followup and technical assistance component   | 230,750          | 96,750            | 327,500          |
| Project evaluation  | 56,000           | 100,000           | 156,000          |
| <b>TOTAL</b>  | <b>1,009,375</b> | <b>989,625</b>    | <b>1,999,000</b> |
| <b>BUSINESS EDUCATION PROJECT</b>   |                  |                   |                  |
| Administration  | 46,400           | 128,400           | 174,800          |
| Development of materials  | 33,000           | 7,500             | 40,500           |
| Reproduction of materials   | 53,000           | 19,000            | 72,000           |
| Course development  | 141,200          | 143,250           | 284,450          |
| Evaluation  | 24,000           |                   | 24,000           |
| <b>TOTAL</b>  | <b>297,600</b>   | <b>298,150</b>    | <b>595,750</b>   |
| <b>TECHNICAL ASSISTANCE PROJECT FOR A PROGRAM TO IMPROVE THE TEACHING OF MATHEMATICS AND SCIENCES</b> |                  |                   |                  |
| Administration  |                  | 75,750            | 75,750           |
| Diagnostic studies  | 200,000          |                   | 200,000          |
| Decision-making   |                  | 25,000            | 25,000           |
| Executive plan  | 100,000          | 200,000           | 300,000          |
| <b>TOTAL</b>  | <b>300,000</b>   | <b>300,750</b>    | <b>600,750</b>   |
| <b>GRAND TOTAL</b>  | <b>1,606,975</b> | <b>1,588,525</b>  | <b>3,195,500</b> |
| <b>SHARE</b>  | <b>50.3%</b>     | <b>49.7%</b>      | <b>100%</b>      |

- 3.32 Counterpart funds. As indicated in the budget summary, the program includes a counterpart funding component in the design of the three projects, under which 50% of each project will be covered. In the project to be administered by the CIDE, the counterpart funds will cover just under 50% of the total amount, but the amount does not take into account the investment already made by both the CIDE and CORD during the prepilot phase of the project.

D. Disbursements

- 3.33 The following special conditions have been established for the first disbursement: (i) the program coordination unit and its advisory board must have been set up and their members appointed; and (ii) once the coordination unit advisory board has been established, an interagency coordination agreement must be submitted that will ensure the proper execution of the program and must be signed by the board members (CIDE, Foundation for Business Education and Andes Foundation), as authorized representatives of the respective institutions.
- 3.34 The financing will be disbursed in accordance with Bank procedures. Three revolving funds will be established, equivalent to 10% of the



funding for each project. The MIF may authorize changes in any of the projects, provided that such changes do not affect the essential objectives of the program or the projects. The semiannual progress reports and evaluation reports stipulated in chapter IX, Evaluation, will be considered relevant for this purpose. The Bank Country Office in Chile will recommend to the MIF any adjustments in the allocation of resources that may be considered necessary.

#### IV. EXECUTION OF THE PROGRAM

##### A. Executing agencies

- 4.1 The executing agency for the program will be the CIDE, which will remain responsible for administering the project for adaptation of new curricula for secondary education and will delegate the direct administration of the project to improve the teaching of mathematics and science to the Fundación Andes and of the business education program to the Fundación Educación Empresa.
  1. Centro de Investigación y Desarrollo de la Educación [Center for Research and Development of Education] (CIDE)
- 4.2 The CIDE, a nonprofit institution established in Santiago, is internationally recognized in the field of education for the quality of its contributions to research and project execution.
  2. Fundación Educación Empresa [Foundation for Business Education]
- 4.3 Established in 1993, the Fundación Educación Empresa is a nonprofit foundation whose purpose is to develop in Chilean children and young people a spirit of liberty, creativity and an entrepreneurship combined with respect for private enterprise. Through the *Junior Achievement* programs, it seeks to link education to the needs of the working world, encouraging responsibility, teamwork, honesty, ethics and decision-making and risk-taking capacity.
  3. Fundación Andes [Andes Foundation]
- 4.4 Established in Santiago in 1984, the Fundación Andes has supported a wide variety of programs for the training and education of young people. During the period 1994-95, it committed almost US\$7 million, 53% of which was for education projects. An analysis of these projects indicates that the bulk of these funds was used for developing human resources in higher education, science and technology and for providing equipment for secondary technical and vocational schools. The projects that received funding included the following programs: equipment for the clothing manufacture shop in a secondary school in the municipality of Peñaflor;

creation and strengthening of the national scientific and technological capacity; management of innovation projects in education; an integrated science and technology information center in the University of Chile; and equipment modernization in the country's vocational education institutions. In addition, Fundación Andes has financed teacher training and cultural activities carried out on an extension basis.

B. The program coordination unit

- 4.5 A coordination unit will be set up in the CIDE, which will act as liaison between the Bank and the coexecuting agencies, Fundación Educación Empresa and Fundación Andes, of the other two projects.
- 4.6 This system for program management offers the Bank and the executing agencies a number of advantages, including: (i) a single window for administrative formalities between the Bank and the executing agencies; (ii) fewer administrative procedures and lower costs; and (iii) independent execution of each project.
- 4.7 The coordination unit's duties will include: (i) maintaining communication with the Bank, and responsibility for collecting the initial and semiannual progress reports; and (ii) coordination of the activities of the program advisory board.
- 4.8 Advisory board. The Executive Director of the CIDE, the Executive Director of the Fundación Educación Empresa, the General Manager of the Fundación Andes and the project coordinators will be members of the advisory board. The first meeting of the board will be held 90 days after the first disbursement has been made. Subsequent meetings will be held semiannually throughout the life of the program. The board's functions will include: (i) compiling and reviewing, on an ongoing basis, new information on matters pertaining to the program and the progress being made; (ii) sharing and integrating the experiences gained, constructively reviewing implementation of each project, noting problems and mistakes with a view to improving implementation and assuring achievement of their objectives; and (iii) coordinating the activities of the three institutions to ensure that there is no overlapping of efforts or resources in the same school, locality or region.

C. Execution of the program

- 4.9 Each project involves different activities for its execution, namely:
  - 1. Project for adaptation of new curricula for secondary technical and vocational education
- 4.10 As described in paragraph 3.4, the project activities have been organized into three components, which will be executed as follows:

a. Curriculum adaptation

- 4.11 Altogether, 10 mathematics modules will be adapted out of a total of 40, and 12 modules on the principles of technology, equivalent to two annual courses, will have to be translated and adapted along with 14 modules on applied biology and chemistry, equivalent to three annual courses. This work will be done prior to the application of the modules in the schools, and will require the hiring of a curriculum specialist for 36 months.

b. Implementation of the curricula

- 4.12 Once the schools have been identified, the following activities will be carried out:
- 4.13 Signature of agreements. Based on the detailed study of the cost of implementing the new curricula in the school, the implementation progress indicators will be decided on and an agreement will be drawn up that will be signed by the CIDE and each of the 10 schools.
- 4.14 Investment studies. The agreements will establish the obligation of each school to prepare an architectural and engineering study for the construction of each laboratory. The studies will be financed by the program and will be conducted by engineering or architectural firms hired for that purpose.
- 4.15 Investments in facilities and equipment and procurement of laboratory supplies. The investment studies will be approved by the project coordinator, after which the funds will be made available for construction or rehabilitation of the respective laboratories. With a representative appointed for each school, the CIDE will form a procurement committee to issue calls for bids for equipment from national or foreign distributors. The committee will also call for bids for fungible materials to be used in the experiments and works, and their replacement. The committee will award the respective contracts following the procedures established by the Bank.
- 4.16 Teacher training. The CIDE will determine the specific training needs for each of the schools and courses. In the case of mathematics, these needs will be met by assigning the teachers who were trained in Waco, Texas, during the pilot phase, while for both principles of technology and applied biology and chemistry the training will be given in Waco considering the small number of teachers who will be involved.
- 4.17 Production and distribution of materials. The CIDE will arrange for production and distribution per course per school of 40 mathematics textbooks, 12 principles of technology textbooks and 14 applied biology and chemistry textbooks, together with translation

and distribution of the motivational videos that go with the mathematics, biology and chemistry modules.

- 4.18 Within the CIDE, or by outsourcing some of the services, a technical assistance mechanism will be set up to support the curriculum implementation process throughout the four-year program execution period.

c. Monitoring, followup and evaluation

- 4.19 Technical assistance will also be provided by CORD, which will send an expert to Chile for the equivalent of 462 days. The purpose of the technical assistance will be the following: (i) to transfer CORD's experience to the Chilean professionals who will implement the program; (ii) to interact with the curriculum expert during the cultural and curricular adaptation phase of the different modules; (iii) to ensure that the adaptation of the materials to the metric system maintains the pedagogic consistency of "Tech Prep"; (iv) to advise in the determination of laboratory specifications and in the procurement processes for laboratory equipment and supplies; (v) to participate in the preparation of the terms of reference for the evaluation and in the design of an in-depth interview for teachers and administrators of the schools involved; and (vi) to advise the program manager or the official responsible for liaison with the schools on any other matter concerning which they may request such assistance.
- 4.20 Evaluation. In view of the new features included in the project and the possible transferability of the concepts to be tested, the executing agency shall, within the first six months of execution, submit the project evaluation methodology, which must include a plan for dissemination of the results to other countries of the region and an analysis of the replicability and transferability of the curricula.
- 4.21 The CIDE, with assistance from CORD, will prepare the methodology for the evaluation of the results of the curriculum innovation in each of the courses in which it is introduced. The evaluation will be conducted at the end of the complete application, throughout an entire school year, of the CORD modules adapted to Chilean circumstances. It will be carried out by consultants who are independent of the executing agency and of CORD. The respective contract may be awarded as a whole or in parts, but the procedures followed must be consistent with those established by the Bank.
- 4.22 At the start of the teaching process based on the modules, each course group will be subjected to a pretest, as will a control group. At the end of the school year, both the experimental group and the control group will undergo a post-test, to determine whether there are any significant differences in their academic performances. Thus, beginning in the first year of the project, the results achieved by the students will be evaluated, and

evaluation will continue throughout all subsequent years. The evaluation process will also review other variables that may be influencing the success of the innovation to a greater or lesser degree.

- 4.23 During the final year of the project the liaison team, with CORD technical assistance, will prepare and conduct an in-depth survey of the teachers and school principals involved in the program in order to find out how satisfied they are with the results of their teaching work and the support received from CIDE. Between 12 months and 24 months after project startup, the liaison team will organize 12 workshops on the relationship between education and the needs of the business world. The workshops will be organized with the participation of each of the schools and will have two objectives: (i) to inform the business community and the education authorities in the school's surrounding area about the pilot program; and (ii) to survey local entrepreneurs and authorities about the resources they would be prepared to contribute to expand it.
- 4.24 The systematization of the costs, together with the findings of the impact evaluation, will be used in a cost-effectiveness analysis to be conducted by an outside consultant who will be especially hired.
- 4.25 The findings of the survey of entrepreneurs and authorities will be used to determine the amount of resources potentially available for extensive introduction of the innovation, and the mechanisms by which a private institute such as the CIDE could collect them.
- 4.26 The findings of the impact evaluations, the cost-effectiveness analysis and the in-depth interviews of teachers and principals and the technical information compiled throughout the life of the project will be used to prepare a final report on the technical and pedagogic, financial and organizational feasibility of general introduction of the new curricula into the other technical and vocational schools in Chile. In addition, the evaluation will be helpful to the Bank in determining the transferability of the pilot project to other countries of the region.

## 2. Business education project

- 4.27 The organization and execution of the courses in the four participating regions will be the responsibility of the coordinator, who will also be in charge of the working team and the design of the plan of action for project implementation. The coordinator will also be responsible for the programming and implementing the courses in the metropolitan area. He or she will be supported by an assistant regional coordinator whose duties will be to program, organize and implement the courses in the four regions and who will make biweekly monitoring and followup visits.

- 4.28 The educational activities, the quality of the measures and the support for the module advisors and monitors will be the responsibility of the chief of the education area, while the review, translation, adaptation and reproduction of the educational materials will be handled by the Fundación Educación Empresa official responsible for materials. The business education materials will be developed by the advisors and monitors hired as consultants for the project.
- 4.29 The six-session courses will be given by the monitors, who are education professionals trained in the respective programs by means of an intensive two-day training course. The monitors are required to prepare course content and activities in order to become real mediators and facilitators for learning. In addition to this training, periodic meetings and supervision sessions will be held to reinforce the training and ensure optimum implementation of the program.
3. Technical assistance project for a program to improve the teaching of mathematics and sciences
- 4.30 The activities for the diagnostic studies will be contracted by the project coordinator using competitive and transparent procedures. It is expected that because of the amounts involved at least three quotes will be obtained, based on the terms of reference prepared by the coordinator and approved by the Bank. The project coordinator will be assisted by the Bank Country Office and the MIF in identifying international and local consultants for the studies making up the prefeasibility stage. The same procedures will be followed for the final stage of the project, the executive plan.

## V. FEASIBILITY, SUSTAINABILITY AND RISKS

### A. Institutional capacity

- 5.1 The teaching, technical and administrative human resources and the material and financial resources for proper execution of the projects are available, to which can be added the extensive experience of the three executing agencies - the CIDE, Fundación Educación Empresa and Fundación Andes - in the execution of similar projects.

### B. Sustainability and risks

- 5.2 The program's financial resources are sufficient to ensure its sustainability. Nevertheless, for each one of the projects there is the risk that they will not replicate themselves further, either because of lack of adequate promotion or a low response from potential users, or else because the financing and cost-recovery

mechanisms prove inadequate. The latter is most critical in the case of the CIDE and Fundación Andes projects, particularly since their purpose is to provide access to the new opportunities offered by the new curricula to young people from low-income families.

- 5.3 For both projects, promotion and financing schemes will be proposed tested using subsidies and cost-recovery mechanisms designed to foster private-sector participation and serve a socioeconomically representative segment of demand. For example, in the project for adaptation of new curricula, business-stakeholder-school workshops will be held to inform the parties about the law on donations for educational purposes, which will be a key element for expansion of the project and its sustainability over time.

## VI. FULFILLMENT OF THE PROGRAM ELIGIBILITY CRITERIA

### A. General criteria for program eligibility

- 6.1 Bearing in mind the objectives of the program and its expected results, the proposed financing to support projects for the transition from the academic to the working world, improved teaching of technical and business skills and setting high standards in terms of knowledge of mathematics and applied science in the secondary education system, specifically technical and vocational training, in order to satisfy the need for investors and a larger and more dynamic private sector, is fully compatible with the general objective of the MIF, in particular Article I(d), namely (i) to identify and implement reform policies in order to increase investment, and (ii) to defray certain costs connected with the implementation of development strategies that will promote expansion of the private sector and thereby increase employment opportunities, thus helping to alleviate poverty and improve income distribution.

### B. Eligibility criteria for the Human Resources Facility

- 6.2 The proposed financing is fully compatible with the criteria for the Human Resources Facility, in particular the provisions of Article III, section 3(e), for the strengthening of vocational training and of other institutions whose aim is to develop the human resource base needed to increase investment flows and expand the private sector.

## VII. COMPATIBILITY WITH THE BANK'S COUNTRY STRATEGY

- 7.1 The program for innovation in training in technical skills is fully compatible with the Bank's strategy in Chile. The latter is based on establishing a relationship that taps Chile's comparative advantages and those of the Bank and will lead to a mutually beneficial dialogue with a potential for positive overflow for the other countries in the region. One of the priority areas is support for innovative projects that promote: (i) a greater role for the private sector, both in delivering public services and in enhancing the country's export capacity by boosting productivity, especially among small and medium-sized businesses; (ii) modernization of the State and civil society; (iii) economic and infrastructure integration; and (iv) the environment and natural resources. The proposed operation will contribute to these objectives in various ways. First, it is designed to increase the technical skills and know-how of young people who are about to enter the labor market by enhancing their applied knowledge of mathematics and science and their entrepreneurial capacity, with the attendant impact on their medium-term productivity. Second, it strengthens civil society by developing management capability and promoting integration of curriculum innovations such as the "school to work" concept and business education. Third, the program makes it possible to launch a dialogue in the region on technical and vocational education and the role the private sector should play in its promotion.

## VIII. AVAILABILITY OF RESOURCES FROM THE MIF

- 8.1 Financial modality. Partial financing of the program is envisaged by means of a grant based on the following considerations: (i) the Donors Committee declared Chile eligible for all MIF financing modalities on October 6, 1993, (ii) the memorandum of eligibility details Chile's compliance with the eligibility requirements for obtaining grants on a national scale; (iii) the proposed program will have an important catalytic effect on training, as required under Article III, section 5(a) of the Agreement Establishing the Multilateral Investment Fund, with regard to its objective of supporting significant expansion of the private sector. The validity of these criteria was confirmed by the Donors Committee at its meeting of March 30, 1994 (MIF-GN-23).



## IX. EVALUATION

- 9.1 The impact of the program will be evaluated by consultants or consulting firms hired for that purpose, through a mid-term evaluation after the first 24 months of program execution, an evaluation after three years of execution and a final evaluation one year after program completion.
- 9.2 The members of the program advisory board will submit to the Bank the indicators to be used for the program evaluation. The executing agencies agree to provide access to all information and documentation needed for the evaluation. Moreover, the executing agencies are to submit an initial report with a schedule of activities and the respective terms of reference within 60 days after startup of the projects and will prepare semiannual progress reports for submittal to the Bank within 30 days after the end of each semiannual period.
- 9.3 Each project has submitted an evaluation plan and the necessary resources have been allocated for financing the individual evaluation of its activities. These plans are described in section C, Execution of the program, of chapter IV, Execution.

# LOGICAL FRAMEWORK

| GENERAL OBJECTIVE  | VERIFIABLE INDICATORS   | MEANS OF VERIFICATION  | ASSUMPTIONS   |
|--|---|--|---|
| To establish higher levels of technical skills and know-how requiring applied knowledge of mathematics and sciences and entrepreneurial capacity at the level of training of the population who will enter the labor market, with a positive impact on the productivity of human capital in the medium term. | <p>Impact analysis of the participating institutions:</p> <ul style="list-style-type: none"> <li>a. Draft versions of new curricula for technical and vocational education.</li> <li>b. Draft of business education curriculum.</li> <li>c. Draft technical assistance plan for a program to improve the teaching of mathematics and sciences.</li> </ul> <p>Institutional analysis of the relations and links created between the coexecuting agencies through the advisory board; continuation of the program activities.</p> | <p>Following studies on:</p> <ul style="list-style-type: none"> <li>a. 10 beneficiary schools compared with a control group.</li> <li>b. Number of schools in which courses have been instituted and number of students enrolled.</li> <li>c. Execution of the program to improve the teaching of mathematics and sciences.</li> </ul> <p>Qualitative study of goals of cases of interagency coordination and expansion of joint activities.</p> | <p>Increase in percentage of GDP allocated to education from 4.5% in 1995 to 7% in 2001.</p> <p>Law 19247 in effect, which enables businesses to allocate funds to schools in exchange for tax credits.</p> <p>Demand for curricula and services that are updated and in line with the needs of technical and vocational schools.</p> |

| ACTS AND COMPONENTS  | BENEFICIARIES/SELECTION CRITERIA   | VERIFIABLE INDICATORS  | MEANS OF VERIFICATION  | EXPECTED OUTCOME OF THE COMPONENT   |
|--|--|--|--|---|
| <p><b>Curriculum adaptation of new curricula for technical and vocational education</b></p> <p>Curriculum adaptation</p> <p>Curriculum Implementation</p> <p>Monitoring and followup</p> | <p><b>Beneficiaries:</b> 10 technical and vocational schools in two regions of the country and 5,250 students who will attend the courses.</p> <p><b>Criteria:</b> (i) commitment by school administration; (ii) support from teachers; (iii) six of the 10 schools will be municipal and four will be private; (iv) eight of the 10 establishments will be technical and vocational and two will be scientific and humanities; (v) priority will be assigned to schools serving students from low-income families; (vi) the funding needed for investments must be available.</p> | <p>a. Adaptation of 10 modules of mathematics, 12 modules of principles of technology and 14 modules of applied biology and chemistry.</p> <p>b. Identification of 10 schools; teacher training; production and distribution of textbooks to the schools.</p> <p>c. Technical assistance from international consultants.</p> | <p>a. Number of courses adapted.</p> <p>b. Number of schools that expressed interest and number selected.</p> <p>c. Survey of the teachers and principals; students' post-project test scores.</p> | <p>1. Introduction of curriculum services updated to the needs of technical and vocational secondary education.</p> <p>2. Preparation of schools to participate in the economic services market.</p> <p>3. Higher levels of competence in mathematics and science among young people who are entering the labor market.</p> |
| <p><b>Entrepreneurship education project for technical and vocational education</b></p>  | <p><b>Beneficiaries:</b> 10,275 students in municipal technical and vocational secondary schools and other schools administered by the SNA located in four regions.</p> <p><b>Criteria:</b> (i) businesses interested in participating; (ii) counterparts interested in leading the operation at regional level; (iii) existence of SNA-administered secondary schools.</p>  | <p>a. Number of schools participating in the project.</p> <p>b. Number of students registered in courses</p> <p>c. Number of courses available for secondary schools</p>   | <p>Internal records and evaluations of the participants</p>  | <p>Development of entrepreneurial spirit and upgrading of technical skills among young people who will serve the labor market and invest in the private sector in education.</p>  |
| <p><b>Technical assistance project for a pilot to improve the teaching of mathematics and sciences</b></p>   | <p><b>Beneficiaries:</b> The country's education system and the stakeholder groups such as the private sector, universities, parents and students.</p>   | <p>Project reports</p>   | <p>a. Diagnostic studies that cover the first stage of the project.</p> <p>b. Detailed design and plan for startup of the program.</p>   | <p>Identification of national strategies for improvement of the teaching of science and mathematics.</p>  |

**ITEMIZED BUDGET**  
(in US\$)

| CATEGORY  | MIF            | LOCAL<br>DISTRIB. | TOTAL            |
|---|----------------|-------------------|------------------|
| <b>PROJECT FOR ADAPTATION OF NEW CURRICULA FOR SECONDARY TECHNICAL AND VOCATIONAL<br/>EDUCATION</b> |                |                   |                  |
| <b>Administration</b>   | <b>167,500</b> | <b>179,000</b>    | <b>346,500</b>   |
| 2. Individual consultants   |                |                   |                  |
| 2.1 Coordinator (45m x 3,500/m)   | 100,000        | 57,500            | 157,500          |
| 2.1 Accountant (45m x 700/m)  |                | 31,500            | 31,500           |
| 6. General support  |                |                   |                  |
| 6.1 Premises — office rental (45m x 500/m)  |                | 22,500            | 22,500           |
| 6.4 Supplies (45m x 3,000/m)  | 67,500         | 67,500            | 135,000          |
| <b>Curriculum adaptation component</b>  | <b>64,500</b>  | <b>64,500</b>     | <b>129,000</b>   |
| 2. Individual consultants   |                |                   |                  |
| 2.1 Course adaptation specialist (33m x 3,000/m)  | 49,500         | 49,500            | 99,000           |
| 2.1 Material adaptation specialist (10m x 3,000/m)  | 15,000         | 15,000            | 30,000           |
| <b>Curriculum implementation component</b>  | <b>490,625</b> | <b>549,375</b>    | <b>1,040,000</b> |
| 1. Professional services firms  |                |                   |                  |
| 1.1 Fees — CORD   | 94,500         |                   | 94,500           |
| 2. Consultants  |                |                   |                  |
| 2.1 Training of teachers in Chile (2 x 2,000)   |                | 4,000             | 4,000            |
| 2.1 Technical support specialists (10m x 2,500/m)   | 25,000         |                   | 25,000           |
| 2.2 Fees — 10 implementation studies (5 x 2,000)  | 10,000         |                   | 10,000           |
| 2.2 Fees — 12 infrastructure studies (7 x 2,000)  | 14,000         |                   | 14,000           |
| 2.2 Fees — business-stakeholder encounter workshops (7 x 2,000)                                     | 14,000         |                   | 14,000           |
| 3. Fellowship-holders and participants  |                |                   |                  |
| 3.1 Registration fees — 4 teachers in Waco, TX  | 22,500         | 22,500            | 45,000           |
| 3.3 Official travel — 4 teachers (4 x 1,500)  | 3,000          | 3,000             | 6,000            |
| 97. Special programs  |                |                   |                  |
| 97.1 Infrastructure   |                |                   |                  |
| Mathematics laboratories (5 x 22,000)   |                | 110,000           | 110,000          |
| Technology and biol./chem. labs (2 x 40,000)  | 40,000         | 40,000            | 80,000           |
| 97.2 Equipment — with replacement of 5%/year  |                |                   |                  |
| Mathematics (5 x 20,400)  | 87,500         | 14,500            | 102,000          |
| Technology (2 x 80,500)   | 100,000        | 61,000            | 161,000          |
| Biol. + chem. (2 x 46,000)  | 65,625         | 26,375            | 92,000           |
| 97.3 Materials - students and teachers  |                |                   |                  |
| Mathematics   | 8,500          | 39,000            | 47,500           |
| Technology  | 6,000          | 8,500             | 14,500           |
| Biol. + chemistry   |                | 9,500             | 9,500            |
| 97.4 Translation, purchase and recording of videos  |                | 111,000           | 111,000          |
| 97.5 Publicity  |                | 100,000           | 100,000          |
| <b>Followup and technical assistance component</b>  | <b>230,750</b> | <b>96,750</b>     | <b>327,500</b>   |
| 1. Professional services firms  |                |                   |                  |
| 1.1 Fees — CORD technical assistance, 12 trips and 40 weeks)  | 134,000        |                   | 134,000          |
| 2. Individual consultants   |                |                   |                  |
| 2.1 Asst. coordinator for liaison with schools (45m x 2,500)  | 56,250         | 56,250            | 112,500          |
| 2.1 Liaison assistant (45m x 1,500/m + per diems)   | 40,500         | 40,500            | 81,000           |

| CATEGORY  | MIF              | LOCAL<br>DISTRIB. | TOTAL            |
|---|------------------|-------------------|------------------|
| <b>Project evaluation</b>   | <b>56,000</b>    | <b>100,000</b>    | <b>156,000</b>   |
| 2. Individual consultants   | 56,000           | 100,000           | 156,000          |
| <b>TOTAL</b>  | <b>1,009,375</b> | <b>989,625</b>    | <b>1,999,000</b> |
| <b>PERCENTAGE</b>   | <b>50.5%</b>     | <b>49.5%</b>      | <b>100%</b>      |
| <b>BUSINESS EDUCATION PROJECT</b>   |                  |                   |                  |
| <b>Administration</b>   | <b>46,400</b>    | <b>128,400</b>    | <b>174,800</b>   |
| 2. Individual consultants   |                  |                   |                  |
| 2.1 Coordinator (18m x 3,600/m)   | 32,400           | 32,400            | 64,800           |
| 2.1 Executive director (36m x 30hrs x 60/hr)  |                  | 64,800            | 64,800           |
| 6. General support  |                  |                   |                  |
| 6.4 Supplies (36m x 390/m)  | 14,000           |                   | 14,000           |
| 6.6 Support staff   |                  | 31,200            | 31,200           |
| <b>Materials development</b>  | <b>33,000</b>    | <b>7,500</b>      | <b>40,500</b>    |
| 1. Professional services firms  |                  |                   |                  |
| 1.1 Fees (translation and design of materials)  | 33,000           |                   | 33,000           |
| 2. Consultants  |                  |                   |                  |
| 2.1 Board of the Foundation (10 members x 6hrs x 125)   |                  | 7,500             | 7,500            |
| <b>Materials reproduction</b>   | <b>53,000</b>    | <b>19,000</b>     | <b>72,000</b>    |
| 1. Professional services firms  |                  |                   |                  |
| 1.1 Fees — courses and publicity materials  | 53,000           | 10,000            | 63,000           |
| 2. Consultants  |                  |                   |                  |
| 2.2 Official resp. for teaching materials (6m x 1,500m)   |                  | 9,000             | 9,000            |
| <b>Course development</b>   | <b>141,200</b>   | <b>143,250</b>    | <b>284,450</b>   |
| 2. Individual consultants   |                  |                   |                  |
| 2.1 Board of the Foundation (10 members x 9hrs/125 x 3)   |                  | 33,750            | 33,750           |
| 2.1 Chief, education area (36m x 1,000/m)   | 18,000           | 18,000            | 36,000           |
| 2.1 Regional coordinator (36m x 750)  | 13,500           | 13,500            | 27,000           |
| 2.1 Psychologist (30hrs x 50/hr)  |                  | 1,500             | 1,500            |
| 2.1 Monitors and monitor training (44 courses x 7 hrs x 18) and (2 days x 4 regions x 500)      | 45,000           | 5,000             | 50,000           |
| 2.1 Advisors and advisor training (44 courses x 9 hrs x 18) and (1/2 day x 4 regions x 600)     | 23,000           | 15,500            | 38,500           |
| 2.5 Travel — monitoring of regions (6,400/yr)   | 19,200           |                   | 19,200           |
| 3. Fellowship-holders and participants  |                  |                   |                  |
| 3.1 Registration fees - fellowships (4 students x 1,500/yr)                                     | 10,000           | 8,000             | 18,000           |
| 3.3 Exchange of presidents (2 x 750/yr)   | 4,500            |                   | 4,500            |
| 97. Special programs  |                  |                   |                  |
| 97.1 Exemptions and commercial center   | 8,000            | 8,000             | 16,000           |
| 97.2 Publicity (4 press releases/yr)  |                  | 40,000            | 40,000           |
| <b>Evaluation of the project</b>  | <b>24,000</b>    |                   | <b>24,000</b>    |
| <b>TOTAL</b>  | <b>297,600</b>   | <b>298,150</b>    | <b>595,750</b>   |
| <b>PERCENTAGE</b>   | <b>49.9%</b>     | <b>50.1%</b>      | <b>100%</b>      |
| <b>TECHNICAL ASSISTANCE PROJECT FOR IMPROVEMENT OF THE TEACHING OF MATHEMATICS AND SCIENCES</b> |                  |                   |                  |
| <b>Administration</b>   |                  | <b>75,750</b>     | <b>75,750</b>    |
| 2. Individual consultants   |                  |                   |                  |
| 2.1 Coordinator (12m x 5,000/m)   |                  | 60,000            | 60,000           |
| 6. General support  |                  |                   |                  |
| 6.1 Premises — office   |                  | 5,750             | 5,750            |
| 6.4 Supplies  |                  | 10,000            | 10,000           |

| CATEGORY                                       | MIF              | LOCAL<br>DISTRIB. | TOTAL            |
|--|------------------|-------------------|------------------|
| <b>Diagnostic studies</b>                      | <b>200,000</b>   |                   | <b>200,000</b>   |
| 1. Professional services firms                 |                  |                   |                  |
| 1.1 Fees                                       | 200,000          |                   | 200,000          |
| <b>Decision-making</b>                         |                  | <b>25,000</b>     | <b>25,000</b>    |
| 2. Individual consultants                      |                  |                   |                  |
| 2.2 Fees — advisory board meetings (5 x 5,000) |                  | 25,000            | 25,000           |
| <b>Executive plan</b>                          | <b>100,000</b>   | <b>200,000</b>    | <b>300,000</b>   |
| 1. Professional services firms                 |                  |                   |                  |
| 1.1 Fees                                       | 100,000          | 200,000           | 300,000          |
| <b>TOTAL</b>                                   | <b>300,000</b>   | <b>300,750</b>    | <b>600,750</b>   |
| <b>PERCENTAGE</b>                              | <b>49.94%</b>    | <b>50.06%</b>     | <b>100%</b>      |
| <b>GRAND TOTAL</b>                             | <b>1,606,975</b> | <b>1,588,525</b>  | <b>3,195,500</b> |
| <b>PERCENTAGE</b>                              | <b>50.3%</b>     | <b>49.7%</b>      | <b>100%</b>      |

PROPOSED RESOLUTION

CHILE. TECHNICAL COOPERATION FOR A TECHNICAL SKILLS  
TRAINING INNOVATION PROGRAM  
(Curricula Updating for Technical Vocational Secondary Education)

The Donors Committee of the Multilateral Investment Fund

RESOLVES:

1. That the President of the Inter-American Development Bank, or such representative as he shall designate, is authorized, on behalf of the Multilateral Investment Fund, to enter into such agreements as may be necessary with the Centro de Investigación y Desarrollo de la Educación (CIDE) and to adopt such other measures as may be pertinent for the execution of the plan of operations referred to in Document MIF/AT-\_\_\_\_\_with respect to a Curricula Updating for Technical Vocational Secondary Education Project within the Technical Skills Training Innovation Program.

2. That up to the amount of US\$1,009,375 is authorized for the purpose of this resolution, chargeable to the Human Resources Facility of the Multilateral Investment Fund.

3. That the above mentioned sum is to be provided on a non-reimbursable basis.

PROPOSED RESOLUTION

CHILE. TECHNICAL COOPERATION FOR A TECHNICAL SKILLS  
TRAINING INNOVATION PROGRAM  
(Business Training Project)

The Donors Committee of the Multilateral Investment Fund

RESOLVES:

1. That the President of the Inter-American Development Bank, or such representative as he shall designate, is authorized, on behalf of the Multilateral Investment Fund, to enter into such agreements as may be necessary with the Fundación Educación Empresa and to adopt such other measures as may be pertinent for the execution of the plan of operations referred to in Document MIF/AT-\_\_\_\_\_with respect to a Business Training Project within the Technical Skills Training Innovation Program.

2. That up to the amount of US\$297,600 is authorized for the purpose of this resolution, chargeable to the Human Resources Facility of the Multilateral Investment Fund.

3. That the above mentioned sum is to be provided on a non-reimbursable basis.



PROPOSED RESOLUTION

CHILE. TECHNICAL COOPERATION FOR A TECHNICAL SKILLS  
TRAINING INNOVATION PROGRAM  
(Technical Assistance for Mathematics and Science Teaching)

The Donors Committee of the Multilateral Investment Fund

RESOLVES:

1. That the President of the Inter-American Development Bank, or such representative as he shall designate, is authorized, on behalf of the Multilateral Investment Fund, to enter into such agreements as may be necessary with the Fundación Andes and to adopt such other measures as may be pertinent for the execution of the plan of operations referred to in Document MIF/AT-\_\_\_\_\_ with respect to a Technical Assistance for Mathematics and Science Teaching Project within the Technical Skills Training Innovation Program.

2. That up to the amount of US\$300,000 is authorized for the purpose of this resolution, chargeable to the Human Resources Facility of the Multilateral Investment Fund.

3. That the above mentioned sum is to be provided on a non-reimbursable basis.