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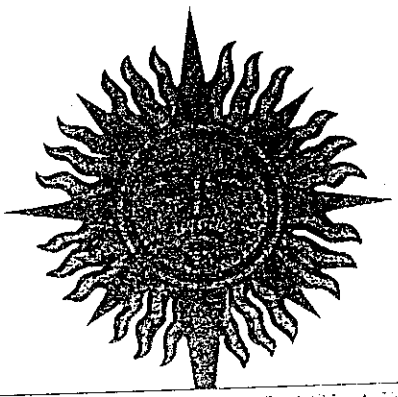
الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)



MIDDLE EAST INFOSEARCH

MEI

Survey of Technical Higher Education in Lebanon

April, 1997

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I. Study Objectives

The primary aim of the study is to solicit financing for the development of a Fachhochshule degree program at the Amlieh Technical School in Lebanon.

The study, hence, is guided by four research objectives:

1. Provide an overview of the industrial sector in Lebanon:

    a) A brief historical background on Lebanon's industrial sector.
    b) A description of Lebanon's main industries: Profile of the industries, number of establishments, number of industrial workers, segmentation of workers per industry.
    c) Employment patterns in the industrial sector.

2. Survey a sample of 30 companies in three main industries in Lebanon to gain insight into:

    a) The dynamics of the job market in the industrial sector: Methods of recruitment, type of jobs available to technical workers; companies' level of satisfaction with local technical education schools and their graduates; perceived sources of problems, if any, and recommended solutions.
    b) Reaction to Amlieh' s proposed program.

3. Identify and list existing technical education programs in Lebanon through a survey of the leading technical schools (eight private schools and two public schools). Gathered information focused on:

    a) Listing the programs on offer.
    b) Listing the private diploma programs on offer.
    c) Listing the total number of students per program for the year 1994.
    d) Listing the total number of students sitting for exams in the BT and TS programs in the years 1991 to 1996, and the numbers of those who passed.
    e) Presenting a brief critique of technical education in Lebanon.

4. Present a full description of Amlieh's proposed new program, under which the study will provide:

    a) An overview of the Fachhochshule degree program in Germany as an exemplary model for emulation.
    b) A brief background on Amlieh.
    c) A description of the new program and the philosophy behind it.
    d) Reaction of technical education experts and interviewed companies to the new program.
    e) Proposed date for the launch of the new program

II. Methodology

A. Desk Research

- The study accessed the following sources to gather information about the Lebanese industrial sector, vocational and technical education in Lebanon, and vocational education systems in Germany:

1. Annual Report - Order of Engineers.
2. Basic Statistics for General Education 93-94 - Educational Center for Research and Development.
3. Education In Lebanon - Adnan Al Amin.
4. Studying in Germany - German Academic Exchange Service.
5. Report on Industrial Census - First and Second Phase - Ministry of Industry.
6. Ninety Years of Vocational and Technical Education in Lebanon - Dr. Assad Younes.
7. Plan to Improve Vocational and Technical Education in Lebanon - Ministry of Vocational and Technical Education.
8. The Investor's Guide - Etudes et Consultations Economiques SARL.
9. The Lebanese Industrial Sector - Lebanese Center for Policy Studies - Dr. Elie Yashoui.

B. Field Research

Technical Schools:

- Face-to-face interviews were conducted with the directors of the following leading technical schools in order to gather background information on their establishments and obtain their feedback on the need to amend the existing vocational education system:

Private Schools

1. Abdel Hadi El Dibs Technical Center - Makassed
2. Amlieh Technical School
3. Centre International des Sciences Techniques
4. Computer & Electronic Center
5. Houssein Bin Ali Institute
6. Institut Byblos
7. Islamic Technical Center
8. Mont La Salle Technical School

Public Schools

1. Dekwaneh Public Technical School
2. Bir Hassan Public Technical School

Industrialists

- A sample of high-level executives in 31 companies operating in three industrial sectors were interviewed to gauge the following:[1]

    1. Current and future demand for qualified technical workers and gaps in the supply market.
    2. Means of recruiting technical workers.
    3. Criteria for acceptance of new technical workers in the surveyed companies.
    4. Job description of technical workers.
    5. Training programs.
    6. Salary ranges of technical workers.
    7. Perception of technical schools' graduates.
    8. Relationship between industrial companies and technical schools.
    9. Feedback on Amlieh's new program.

- The choice of the industrial sectors to be covered by the study depended mainly on the sectors' role in industry (Food & Beverages), contribution to exports (Paper and Paper Products), and heavy concentration of technical labor (Electric and Electronic Machinery and Food and Beverages).

[1] The choice of the industrial sectors that were covered by the study depended mainly on the sectors' growth potential and their participation in Lebanese exports.

- The interviewed companies are the following:

a) Paper Industry

1. Dabbous A.M Trading Est.
2. Lebanese Carton Company
3. Middle East Printing and Recycling Company
4. Mimosa Societe - Papier Hygienique
5. Nasr Printing Company
6. Sanita Paper & Plastic Products
7. Sidema Industry & Emballage S.A.L
8. Societe Industrielle de Papier et de Carton Ondule S.A.L
9. Tecno Press
10. Zgheib Press

b) Food and Beverage Industry

1. Brasserie & Malterie Almaza SAL
2. Conserves Modernes Chtaura S.A.L
3. Cortas Canning & Refrigerating Company SAL
4. Gantous & Abou Raad
5. Ghandour Abdel Kader & Sons SAL
6. Industrial Laveluxe Factories
7. Kassatly Chtaura - SOLVID
8. Liban Glaces S.A.L
9. Mounir El Bsat Factories
10. Societe Moderne Libanaise pour le Commerce SAL (PEPSI COLA)

c) Electric and Electronic Machinery

1. Ascenseurs du Liban S.A.L
2. Burotec
3. DYAR for Trading and Contracting
4. Kassardjian Ohannes "Fonderies" SAL - Metal product industry
5. Liban Cables S.A.L
6. Middle East Cables S.A.R.L
7. Modern Company for Cables Industry
8. Optimal Electric S.A.R.L
9. Societe D'Expansion Technique et Industrielle Charles Keller S.A.R.L

Experts on the Technical Education Experts

- An interview was conducted with Dr. Assad Younes, Head of the Educational Methods Bureau in the Educational Center for Research and Development. Dr. Younes was interviewed about:

    1. The technical education system in Lebanon: problems and weaknesses,
    2. The Ministry of Vocational Education's plan to improve vocational education and the project it intends to implement.
    3. Amlieh's proposed Fachhochshule-like program.

Holders of Fachhochshule Degrees

- Interviews were conducted with nine holders of Fachhochshule degrees and one holder of a German "academic" engineering degree who are working in Lebanon in order to gauge the advantages/disadvantages of holding such degrees in Lebanon.

C. Sources of Error

1. Data on the industrial sector vary between sources. Only data that were consistent among the majority of sources were adopted in this study.

2. A more thorough analysis of the role of industry in the national economy was hampered by the absence of a constant stream of official statistics on the Lebanese economy.

III. Country Profile

A. Geography and Population

Lebanon lies on the East Mediterranean coast and shares its borders with Israel in the South, Syria in the East and North, and the Mediterranean Sea in the West.

A relatively small country, Lebanon has a total area of 10,452 sq. km and a population of 3.11 million.[2]

B. Politics

Lebanon declared its independence from the French Mandate in 1943. The political system is a parliamentary democracy with an independent judicial system.

After a sustained period of relative stability in a turbulent region (Middle East), a civil war broke out in Lebanon in 1975. The main cause was the breakdown in the Christian–Muslim consensus over the constitution, which gave Christians a disproportionate political voice. The presence of independent factions, each with its own grievances and competing foreign patrons, added to the complexity of the war. After 16 years of civil war, the 1991 Taef peace accords, to which the various factions were signatories, officially ended the war.

Over the past four years, the country has enjoyed a gradual, if tentative, return to normal life. The country's relative political stability, however, remains seriously susceptible to outbreaks of violence in the South and the unpredictable course of the peace process. Israel continues to control 15% of Lebanese land in the South as part of its self declared security zone, and the country's internal security remains largely the responsibility of both the Lebanese and Syrian armies and public security bureaus.

[2] 1995 estimate

C. Economy

The government has adopted since independence a free-market, non-interventionist economic policy which led, before the eruption of the war in 1975, to an economy that was one of the healthiest and most developed in the region, with a large service sector, an expanding industrial base, and a small, export-driven agricultural sector. Due to the flow of petrodollars and the relative stability of the country, Lebanon became the banking center of the Middle East and a clearing house between most of the Arab world and the West.

The civil war crippled the economy and severely diminished Lebanon's economic role in the region. The economy shrank by two thirds during that period, foreign service concerns relocated elsewhere in the Middle East, more than 500,000 people, or around 20% of the population, immigrated, and the war destroyed or severely damaged the industrial, agricultural, and communication infrastructure. The Lebanese Pound went into a free fall, losing 99.8% of its value, and consequently inflation was rampant, peaking at 476% in 1987.

After the 1991 peace accords, the economy shot up by 40% in that year and economic growth averaged 7% in the years after. The Hariri government, which took office in 1992, made the rebuilding of the infrastructure its priority. Its current reconstruction plan, Horizon 2000, envisions investing around $10 billion over 10 years for the rebuilding of the infrastructure.

Although the government's efforts, as highlighted by the Horizon 2000 plan, are one to two years behind schedule, they have been able to partially revive the economy. In 1995, economic growth averaged 7%, (the GNP is estimated at $11 billion, the GNP per capita is at $3,098) inflation was reduced to 10% and the current account surplus stands at $256 million.

However, while the country's ambitions are big, its financial and natural resources are limited. In order to sustain its rebuilding drive, Lebanon is already under $11 billion of debt, and has just managed another $3.2 billion in loans pledged by several European and Asian countries during the "Friends of Lebanon" conference which was held in December 1996 in Washington D.C.

For a detailed account of Lebanon's economic indicators, please review the data sheets in the appendix.

IV. The Industrial Sector

A. Overview of the Industrial Sector

Technical workers in Lebanon work predominantly in the industrial sector. Hence an overview of the sector will help shed light on its relevance to technical education policy and influence on employment patterns of technical workers.

This section presents:

1. A historical background of the industrial sector in Lebanon.
2. The main industries in Lebanon and segmentation of industrial workers per industry.
3. Employment patterns of technical workers in the industrial sector.

1. Historical Background

Historically, the industrial sector has played a modest role in the Lebanese economy. Before the eruption of the civil war in 1976, the sector was consistently outpaced by the service and agricultural sectors, and suffered the benign neglect of consecutive Lebanese governments.

During the 16 year civil war, the industrial sector was dealt a series of set backs which ensured its marginal contribution to GDP. By 1985, 25% of the country's productive capacity was destroyed and factories operated at 25% of pre-war capacity. [3]

However, although the sector's share of GDP remained under 20% during the war years, its resilience to the more debilitating effects of the war is noteworthy. While the sector's share of GDP in 1973 was 13.4% , it reached 15% in 1987, and grew to 18.5% between 1988 and 1992, the year after the war officially ended. Meanwhile, the value of industrial output quadrupled between 1974 and 1994, jumping from an estimated 2.3 billion LL. ($760 million) in 1974 to approximately $3.72 billion in 1994.[4]

The number of Lebanese factories and industrial workers also increased over the past four decades. The number of factories increased from 3200 in 1958 to 22,000 in 1994, and the number of industrial workers climbed from 21,800

[3] Economist Intelligence Unit (EIU), Country Profile, 1994-1995.
[4] EIU, 1994-95, and the 1994 industrial survey.

to 140,000 during that same period of time (although the number of industrial workers did suffer a dramatic fall between 1976 and 1985, when the immigration of over 32,000 industrial workers reduced their numbers in the country to only 62,500). [5]

Economists concur, however, that, in the absence of a well articulated government strategy, the industrial sector will remain on the margins of the Lebanese economy, thriving primarily on the initiative of the private sector.

The post civil war transitional period and unpredictability of the pace, or even eventuality, of the regional peace process render the sector's short to medium term prospects somewhat difficult to project. Over the years, government policy towards the industrial sector has been less than encouraging, and Prime Minister Raffic Harriri's 10 year development plan does not suggest any qualitative change. Although the plan calls for a complete review of laws governing industrial investments and the introduction of a series of administrative reforms, the track record of Lebanese governments in policy implementation does not inspire optimism. Moreover, although the plan allocates $400 million to the sector, $280 million (58%) of it will be effected well after the year 2000. Meanwhile, real growth through private financing remains an open question. Recent interest by various investment houses aside, Lebanese banks have proved as credit strict as the government; bank loans to industry represented only 14% ($800 million) of total bank loans in 1995.

Hence it is not altogether unsafe to conclude that should the industrial sector's share of GDP increase over the next five years, the increase will at best be incremental.

2. Main Industries in Lebanon and Segmentation of Industrial Workers[6]

Lebanon's Five Main Industries

More than 95% of registered companies in Lebanon operate in manufacturing industry, while only 2.3% operate in construction, and 1.1% in mining and quarries.

Five main industries control the Lebanese industrial sector: Food and Beverages, Furniture, Fabricated Metal Products, Clothing, and Wood Products. These industries account for 70% of industrial establishments and approximately 59% of the work force. The Food and Beverages industry stands as the largest player in the sector, boasting 20.16% of companies and

[5] The industrial survey conducted by the Ministry of Industry in 1986, which estimated the total number of industrial workers in 1985, did not cover all of Lebanon, and thus the final numbers are considered rough estimates. Other sources place the number of industrial workers in 1985 at a significantly lower 45,000.

[6] All data presented on industrial units were accessed from the industrial survey of 1994.

21.27% of the workforce, followed by clothing (13.59% and 12.39%, respectively) and Fabricated metal products (13.89% and 9.10%, respectively) (see Chart IV.A.1). In 1994, gross fixed capital formation was estimated at $197 million, with the Non-Metallic Products and the Food and Beverages industries constituting 22.2% and 20.5% of industrial investments, respectively.

Significantly, only 40 Lebanese industrial firms have a staff of 250 employees and over, but they constitute 14.7% of industrial output. The majority of these companies belong to non-metallic products and minerals and the Food and Beverages industries (see Chart IV.A.2).

Profile of Industrial Establishments

Today there are 23,518 registered industrial establishments, most of which are operational. The overwhelming majority of industrial establishments are small, family owned outfits. In 1994, 76% of units were single shareholder companies, and 68% employed less than five workers. A high 72% of factories employ only 27% of the workforce.

Two principal factors contribute to the small or medium size of the majority of industrial firms:

1. Most of the industrial firms are newly established. Only 12% of the firms were established before the 1970s, while 43% are less than four years old.

2. The relatively low wages pushed a large number of industrial workers to open their own small enterprises.

3. Employment Patterns of Technical Workers in the Industrial Sector

The current number of industrial workers in Lebanon is estimated at 140,000, only 47% higher than what it was in 1974 (96,400). This number would have been larger if 32,000 technical workers had not immigrated during the war.

Very few studies have been conducted on technical workers in Lebanon. Information, therefore, is cryptic and incomplete. However, three separate studies which were undertaken between 1981 and 1994 on the Lebanese labor force and the industrial sector highlight three crucial realities which have come to define the technical labor market:

Chart IV.A.1

Distribution of Industrial Workers and Industrial Firms by Main Industries-1994

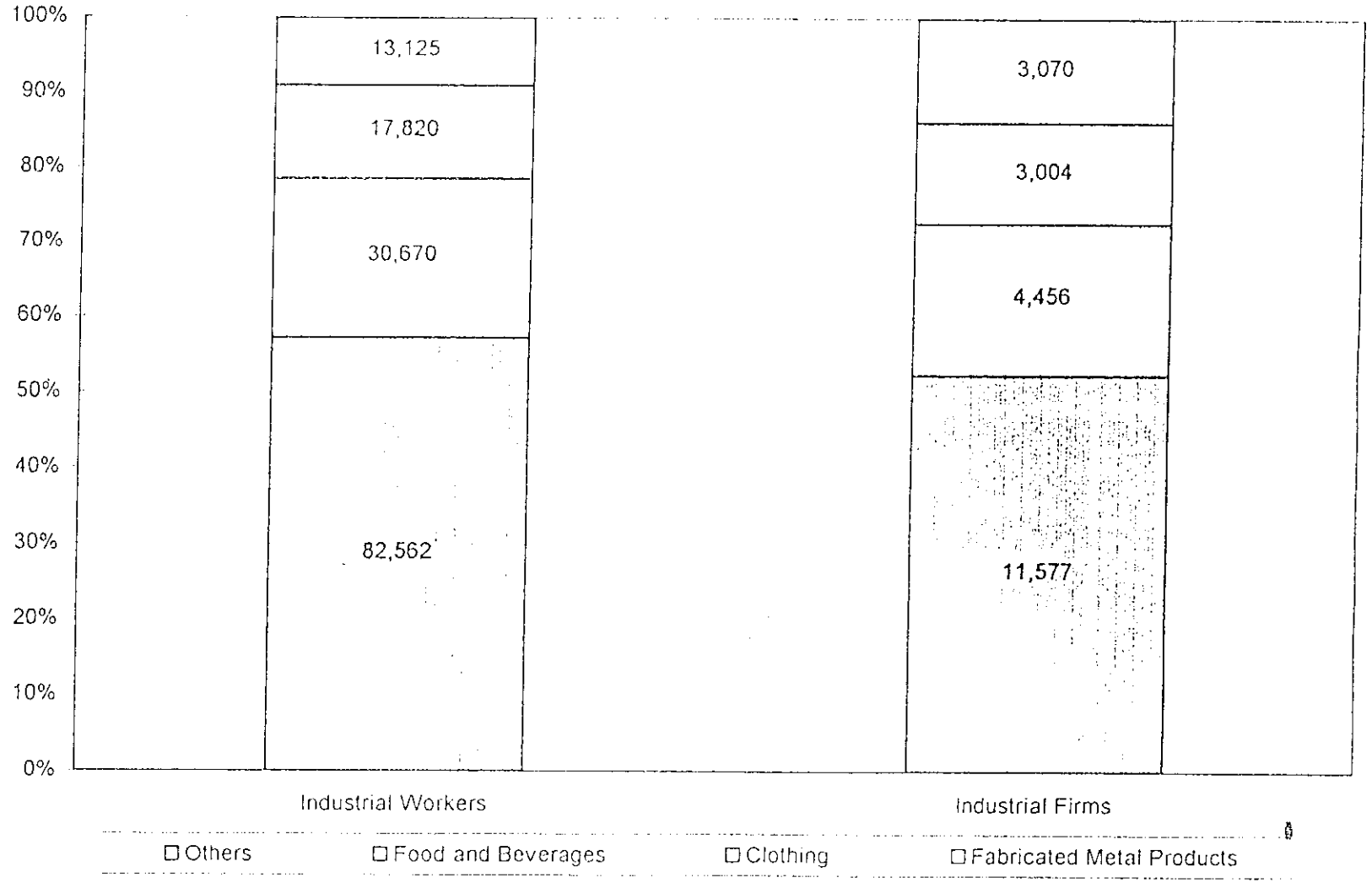
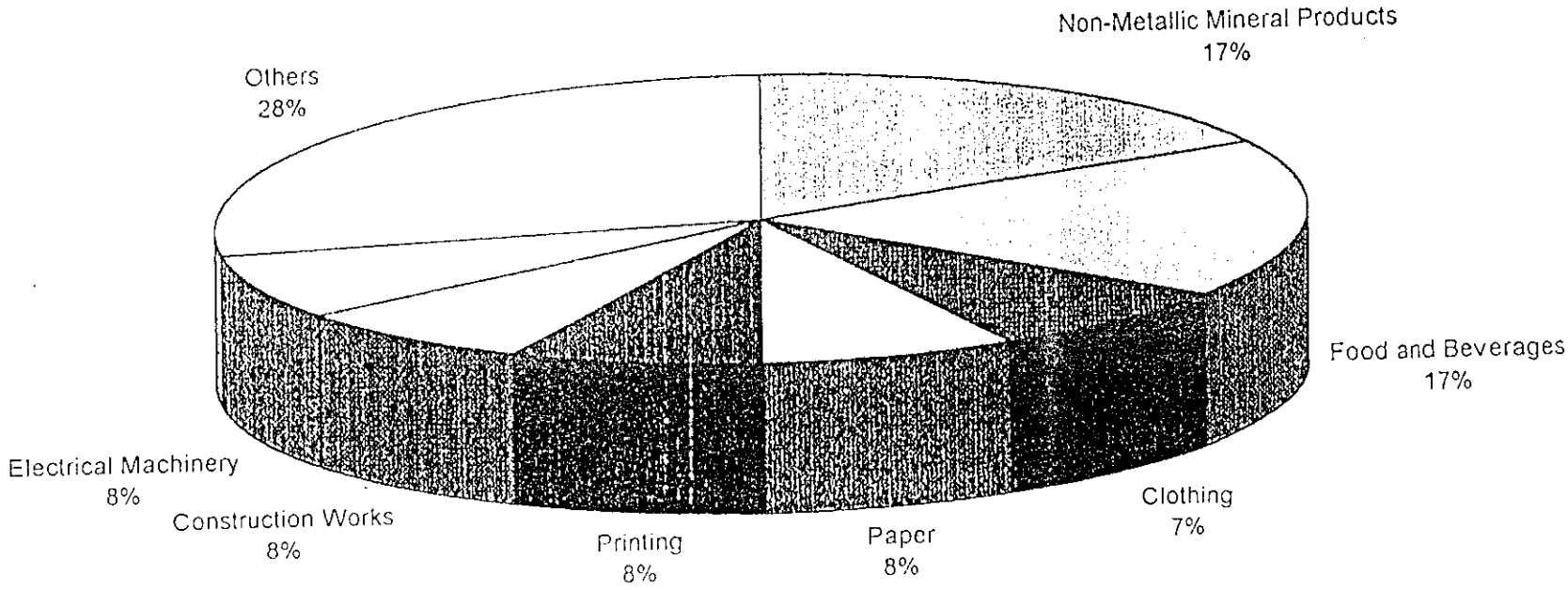


Chart IV.A.2

Distribution of Companies that Hire more than 250 Workers by Industry



a) **Many of Lebanon's qualified technical workers have immigrated:** In his "The Labor Force and the Civil War"[7], Dr. Nadim Khalaf reported the immigration of over 32,000 industrial workers to Gulf countries, many of whom were technical workers highly experienced and qualified in their fields of specialization. This "mass migration" of qualified technical workers created an immediate and perceptible shortfall from which many of Lebanon's major industries continue to suffer. Furthermore, the continuing depressed wages of technical workers in Lebanon, in comparison to those in the Gulf, is still inhibiting the return of many of these technical workers.

b) **The overwhelming majority of industrial workers do not hold a technical or academic degree:** According to two surveys conducted by the Ministry of Industry in 1986 and 1994, the percentage of industrial workers who do not hold any technical or academic degrees was 67% in 1985 and 70% in 1994. These figures further explain the small pool of qualified technical workers in Lebanon.

c) **A very small number of companies have training programs:** According to Frederish Eibert 's 1993 survey of 110 industrial establishments, only 2.65% of industrial workers attended a training program, either with the company or on their own.

Significantly, technical education experts, such as Dr. Assaad Younis, [8] point out that this trend is exacerbated by a weak technical education system that is graduating significant numbers of unqualified technical workers into a sector which does not want them and can ill afford to absorb them (see critique of the technical education system, p 20).

The ramifications of this trend reach beyond the industrial labor market into the more serious issues of Lebanon's competitive edge and the evolving needs of its economy.

[7] Dr. Nadim Khalaf, The Labor Force and the Civil War, 1981, American University of Beirut.
[8] Dr. Assaad Younis is the foremost technical education expert in the country. He has published many books and articles on the subject, and was instrumental in fashioning the Ministry of Technical Education's 1993 reform plan.

Admittedly, data on the Lebanese economy, surpluses and shortages in specializations, and unemployment are sketchy and unreliable. However, as with other Middle Eastern countries, trends in Lebanon's labor market are influenced by three factors:

a. A high population growth rate of 3.1.
b. An age pyramid that has approximately 30% of the population under the age of 15.
c. An educational system that traditionally has been very poor in proper career counseling, is biased towards a few professional academic degrees, and is neglectful of technical and vocational education. The results are academic graduates ill suited for the economy's changing needs; an influx of technical workers whose lack of qualifications inadvertently strengthen society's prejudice against them; and a potentially explosive problem of youth unemployment, estimated in 1994/1995 at 43%.[9]

Should the country's educational and labor policies not take full account of these three factors, the gap between the economy's needs and the job market will grow even wider.

B. Survey of Industrial Establishments

To gain further insight into the dynamics of the industrial labor market, a total of 31 face to face, in-depth interviews were conducted with companies operating in three major industries: The paper industry, whose output represented 32% of exports in 1996; the Food and Beverages industry which is one of Lebanon's five main industries, and the Electric and Electronic machinery industry which boasts one of the largest concentrations of technical workers in Lebanon.

Dynamics of the Job Market in the Industrial Sector

All interviewed companies confirmed the problems identified by the three studies discussed in the previous section. Consistently, interviewed companies complained about encountering serious difficulties when recruiting technical workers. The overwhelming majority do not have an established relationship with any of the technical schools and recruit either through personal contacts or aggressive enlistment of experienced and qualified workers from other companies. More significantly, only the larger companies (50 employees and above), which recruit fresh graduates from technical schools have well developed in-house training programs to

[9] Youth unemployment figures for Egypt, Jordan and Syria are 54%, 28% and 18%, respectively.

help the worker overcome gaps in his technical proficiency and weak practical training.

Interviewed companies also pointed out that technical workers' present qualifications render them best suited for two job descriptions for which they are usually recruited: Machine operation and machine and equipment maintenance under the supervision of the resident engineer. A few companies indicated that since Lebanese industry is still somewhat undeveloped, "academic" engineers, who are usually best qualified for research and development, tend to be hired for supervisory responsibilities with a heavy emphasis on practical applications, a job description for which "technical" engineers are recruited in Europe.

Without any exceptions, companies cited four main reasons for this seemingly pervasive problem of weak qualifications of technical degree holders:

1. **Outdated curricula** which have not been updated since the 1970s (all Lebanese technical education schools have to abide by the government's official curricula in the TS and BT programs).
2. **Obsolete workshops** which train students on old machines that have long been discarded by industry. (This problem is common to all public schools and many private schools which, for financial reasons, cannot afford to update or invest in machine upgrading.)
3. **An educational program which overemphasizes theoretical courses** at the expense of practical training. Hence, companies complain, students graduate with a background virtually devoid of practical training.
4. **Weak specialization programs** which provide students with only general knowledge of their fields of study, and limit the number of specializations to very few fields. Hence needed specializations in food technology, industrial electricity, industrial mechanics, to mention only three, are not offered by the overwhelming majority of technical education schools.

The result is a small pool of qualified and experienced workers, for whom large outfits compete fiercely and without whom many of the smaller outfits have to manage.

This shortfall in qualified technical labor is reflected in the insignificant difference between technical degree holders' wages and those of other technical workers who do not hold any degree. On average, a fresh graduate is offered a salary that ranges between $200 and $300, while a non-degree holder with no practical experience gets an average salary of $200, equal to the minimum wage.[10]

[10] The above mentioned salaries do not take into account the special allowances (national social security fund, medical insurance, yearly bonus etc..) given by private sector companies.

Not surprisingly, this feedback from companies echoes the findings of experts on technical education, whose criticisms have long sounded the alarm on the deteriorating standards of the country's technical education system.

V. Technical and Vocational Education in Lebanon

A. Overview

Lebanon has a long tradition of vocational and technical education dating back to 1904, when the Ottoman Governor of Beirut established the first technical training center.

1. The Six Official Programs

Today, there are six official technical education diplomas, and 262 technical education schools which offer them:

Degree	Duration	Acceptance Requirements	Objectives of the Degree
Certificat d'Aptitude Professionnelle (CAP)	Two years	• Age between 12 and 16	• Train a semi-skilled worker
Brevet Professionnel (BP)	Two years	• Age between 13 and 18 • Passed the second intermediate class	• Train skilled worker
Formation Professionnelle de Maitrise (FPM)	Three years	• Age between 15 and 20 • Passed the fourth intermediate class or holds the BP degree	• Train a workshop supervisor
Baccalaureat Technique (BT)	Three years	• Age between 15 and 20 • Passed the fourth intermediate class or holds the BP degree	• Train the student to hold low-level executive positions
Technicien Superieur (TS)	Three years	• Age between 17 and 23 • Holds the BT or the academic baccalaureate	• Train workers that can hold middle-level managerial positions in industrial firms
Licence Technique (LT) or Licence Technique d'Enseignement (LET)	Four Years	• Hold the TS degree	• The LET degree qualifies its holder to teach in any public or private technical school

Upon passing the fourth intermediate class, students choose between a secondary technical education, leading to a Technical Baccalaureate (BT) degree, or a secondary academic education, leading to the Academic

Baccalaureate. Holders of these two types of Baccalaureate degrees can opt for either higher technical education (TS) or for university education.

Industrial and Paratechnical Specializations

The majority of private and public technical schools offer the BT and TS programs. However, only a few of them offer the complete range of specializations within these programs, mainly due to these schools' limited financial resources and the small student body.

Specializations fall under two main categories: industrial and para-technical. The core specializations on offer are:

Industrial specializations (TS)	Paratechnical specializations (TS)
Electricity	Accounting
Electronics	Commercial sciences
Mechanics	Fashion design
Civil Engineering-Topography	Interior design
	Computer science
	Programming and business computer

Private Diplomas

In an effort to upgrade and update the curricula, private technical education schools, which represent 89% of the total number of technical schools, have introduced additional special training programs at the TS and BT levels. Public technical schools, however, have to adhere to the outmoded official curricula. None of the private diplomas is officially recognized by the government.

The eight leading private schools, which were interviewed for this study, offer a total of nine private industrial specializations and 19 paratechnical specializations.

The more popular private industrial and paratechnical specializations are:[11]

Industrial specializations	Paratechnical specializations
Automobile mechanics and electricity	Accountancy
General electronics	Computer programming
General electricity	Secretarial
Radio and TV technician	Type writing

Notable exceptions notwithstanding, in the absence of rigorous government standards, there is a high supply of private diplomas that are not necessarily up to standard. Educational experts, such as Dr. Younis, agree that most private diploma programs suffer the same weaknesses as the official programs: an overemphasis on theory, very little practical training, and obsolete workshops that train students on old machinery.

2. Technical Education Students

The number of students in vocational education has enjoyed a steady increase over the past four decades, jumping from 2,607 students in 1951 to approximately 44,651 students in 1994. Moreover, the percentage of BT students to total secondary students increased from 11% in the beginning of the 1980s to 22% in 1994, reflecting the rising popularity of vocational education. Predictably, private schools which far outnumber public schools (233 vs. 29), absorb 79% of students.

In 1994, the number of students registered in BT and TS programs was 23,040 students (51% of total technical education students) distributed as follows:

Sector	BT	TS	Total	%
Private	11,832	4,103	15,935	69%
Public	5,651	1,454	7,105	31%
Total	17,483	5,557	23,040	100%
%	76%	24%	100%	

On the other hand, the number of students registered in private diploma programs reached an estimated 13,200 in 1994, an impressive 37% of the total number of students at private technical schools.[12]

[11] These are specialization offered by two or more schools.
[12] 1994 is the last year for which complete official data on the total number of students are available.

Chart V.A.1

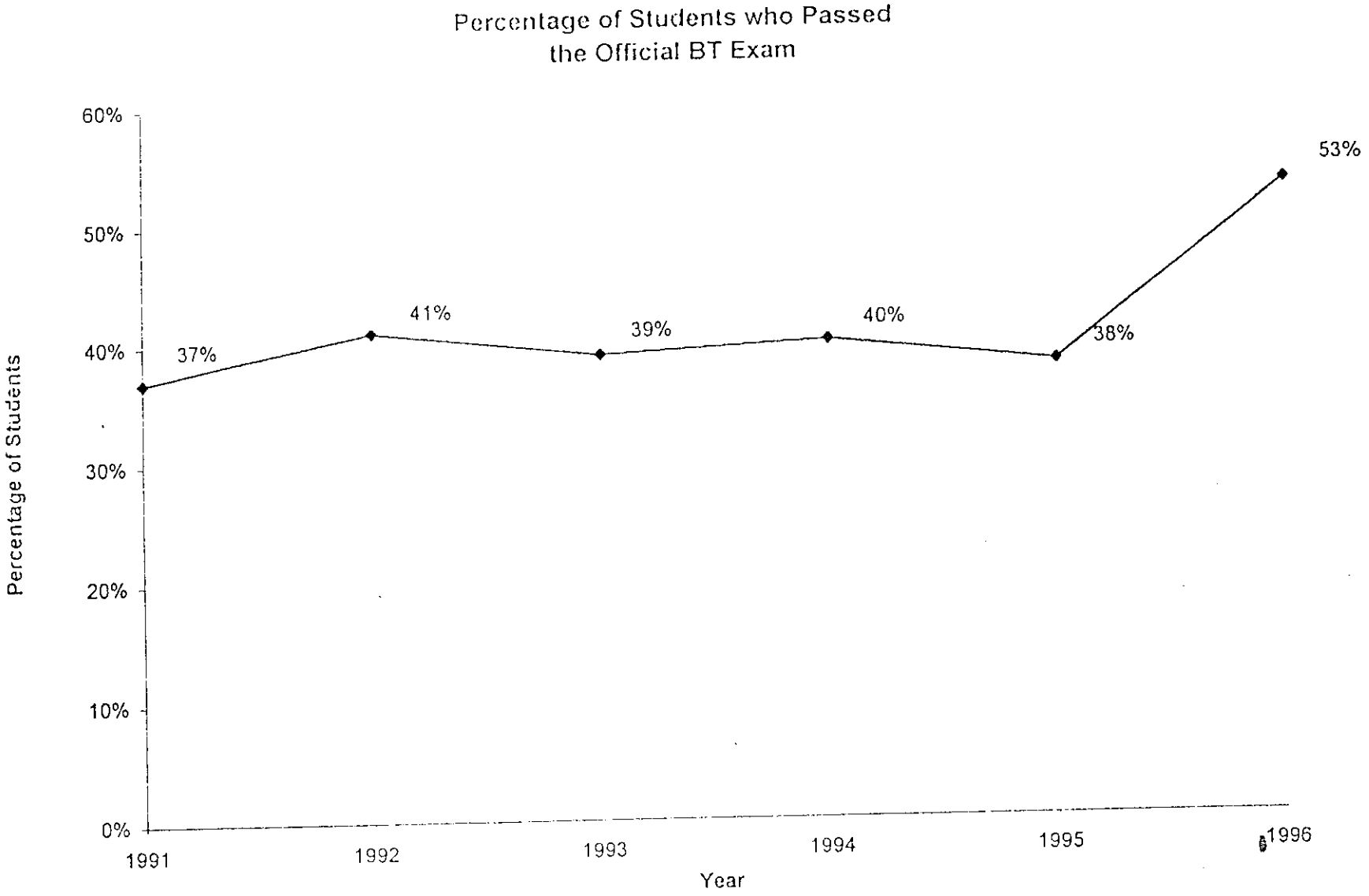
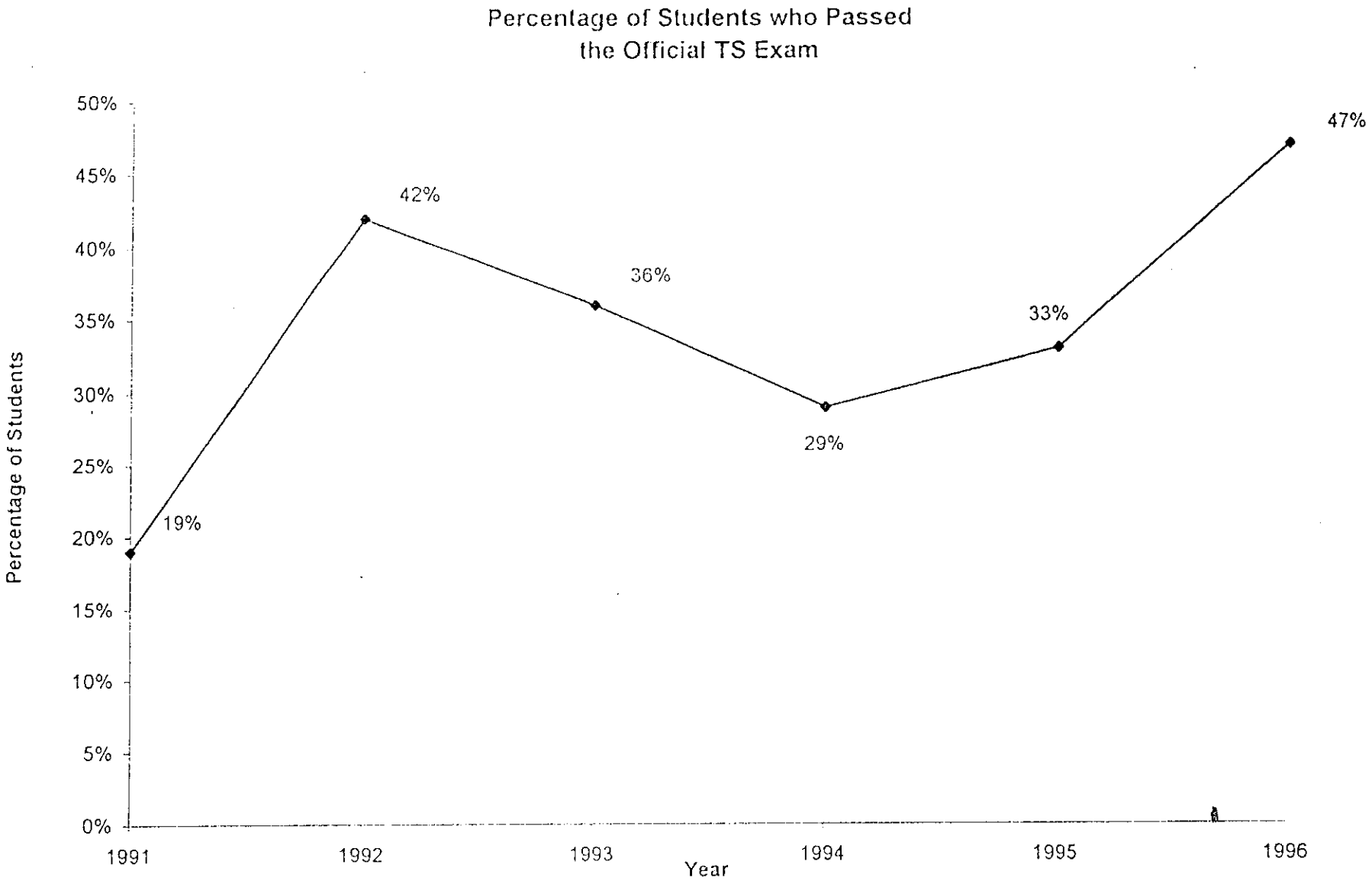

Percentage of Students who Passed
the Official BT Exam
Percentage of Students
60%
50%
40%
30%
20%
10%
0%
37%
41%
39%
40%
38%
53%
1991
1992
1993
1994
1995
1996
Year

Chart V.A.2


Percentage of Students who Passed
the Official TS Exam
Percentage of Students
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
19%
42%
36%
29%
33%
47%
1991
1992
1993
1994
1995
1996
Year

Significantly, the palpably low, albeit improving, number of students who have passed the TS and BT official exams between 1991 and 1996 brings into even sharper focus the poor standards of technical education in Lebanon. For example, between 1991 and 1996, 19%, 42%, 36%, 29%, 33%, and 47% of TS students who sat for the official exam in each respective year passed. On the other hand 37%, 41%, 39%, 40%,38%, and 53% of BT students who sat for the official exam in those same years passed (see Charts V.A.1 and V.A.2).

3. A Critique of the Vocational and Technical Education System in Lebanon

Dr. Assaad Younis, a renown expert in the Lebanese technical education system, who was instrumental in devising the Ministry of Technical Education's 1993 "Plan to Improve Vocational and Technical Education," cited six main areas of weakness in Lebanon's technical education program. Four of these weaknesses are highlighted and discussed as directly relevant to this study:

a) The organization of the Ministry of Vocational and Technical Education
b) The outdated official curricula and obsolete workshops
c) Old books and even older educational methods
d) The severe shortage of qualified technical teachers and trainers
e) Damaged and decrepit public school buildings
f) The absence of proper career guidance

Significantly , many of Dr. Younis' criticisms and recommendations were shared by the overwhelming majority of interviewed schools and industrial establishments. But four years after the completion of the 1993 plan the government has yet to take any concrete steps in implementing its recommendations. It would seem that the government's limited financial and human resources and the enormity of the rebuilding effort are delaying action in this area, to the detriment of the long term prospects of the technical education system.

The Organization of the Ministry of Vocational and Technical Education

Predictably, the official curricula cannot be properly updated without aggressive and radical reforms by the ministry. However, the ministry, underfunded and understaffed as it is, cannot rise up to the challenge. Hence, Dr. Younis and his team outlined three recommendations for the ministry:

1. Recruit new qualified staff to shoulder the responsibility of upgrading the curricula. At present, the ministry has a staff of 38 personnel, many of whom are not qualified for this task.
2. Centralize the development of the curricula and educational methods.
3. Computerize the work of the ministry.

Outdated Curricula and Obsolete Workshops

The official curricula of the BT and TS programs are outdated. The last time the curricula were revised was in the 1970s.

According to Dr. Younis, the TS student spends only 32% of his school time on practical courses (time spent in workshops), as opposed to, for example, a German apprentice who spends around 80% of his apprenticeship time on on-the-job training.

More significantly, Dr. Younis stresses, the time actually spent in workshops goes to naught in the majority of cases because of two reasons which are at the root of the current problem:

1. The obsolete workshops at most schools, which graduate most students with useless practical training.
2. The total lack of cooperation between the country's leading industries and most of the schools, which deprives the latter of proper direction when introducing new specializations or improving old ones, and denies the former badly needed qualified technical workers.

These two main flaws in the system motivated Dr. Younis and his team to adapt the *German Apprenticeship Program* to Lebanon's unique circumstances and to develop the **Dual Educational Approach** as an integral part of the 1993 plan. This approach aims at three main improvements in each of the three years at the TS program:

3. In the first year, the student will be offered extensive courses in theory with the aid of an upgraded curriculum.
4. In the second year, the student, through a framework of cooperation between the schools and industries, will receive intensive practical training in his own specialization during the first two summer vacations.
5. In the third and final year, the student spends four days of the week at an industrial establishment, after which he /she submits a "project" paper directly related to his training at the establishment.

Technical Teachers and Trainers

There is only one public institute in Lebanon, Institut Pedagogique National pour L'Education Technique (IPNET), that trains teachers (theoretical courses) and trainers (practical courses) for public and private technical schools.

The number of specializations in this institute is ten, by far less than the 100 specializations offered by the various official technical programs (CAP, BP, FPM, BT, TS etc..). In fact, in 1996, the school offered only six specializations (Electronics, Electricity, Mechanics, Civil Engineering, Business Computer, and Medical Laboratory) because of the low number of students enrolled in the teacher training program.

The Director of the school, who was interviewed for this study, emphasized that the weak backgrounds of many of the BT students in science courses (mathematics, physics...) prevents the school from offering more focused specializations in the TS program; a problem cited as well by Dr. Younis as inhibiting schools from meeting one of the industries' central requirements: technical workers with more focused specializations.

This shortage in teaching schools and the severely limited number of specializations on offer has forced schools to hire qualified technical workers as teachers on a contractual part-time basis.

Career Guidance

Career guidance is practically non-existent. Moreover, when allocating blame for many of the problems afflicting the present education system, interviewed companies, schools, and experts alike identify social stigma as, perhaps, the biggest culprit. Lebanese society's proclivity for academic degrees and prejudice against technical education diplomas fuel this social

stigma which tends to steer good students away from technical education, thus reinforcing the misperception that technical education is for academic failures; excuses the government's dereliction towards the technical education system; and, most significantly, contributes to the last link in this vicious cycle: the depressed wages of technical education graduates, who are not qualified enough to receive higher salaries.

Dr. Younis stresses that this stigma is deeply entrenched in the Lebanese culture and cannot be addressed without an intensive public awareness campaign, coupled with a complete overhaul of the technical education system and proper career counseling that directs students towards the market's needs.

German corporate culture that encourages large enterprises to train more apprentices than they could possibly recruit.

2. **Fachhochshule:** The establishment of the Fachhochshulen in Germany was the direct result of the need to help German industry maintain its competitiveness in the international markets. There was increasing demand for better qualified, technically trained labor who can quickly undertake practical tasks.

   Since their establishment, Fachhochshulen have gained increasing popularity: The number of students studying at a Fachhochshule has grown five fold since the program was founded; 35% of all higher education graduates and more than half of the engineering graduates come from a Fachhochshule.

   In 1995, more than 400,000 students, 24,000 of whom were foreign, were studying at the approximately 150 Fachhochshulen in Germany.

   What attracts students towards Fachhochshulen is the highly practice oriented education, and the wide range of specializations directed towards the need of the job market. The Fachhochshulen offer specializations in 15 main fields, which in turn are subdivided (Appendix). The 15 main fields of specializations are: Engineering, business administration, industrial engineering, social services studies, design studies, computer and information science, mathematics, archiving, library and documentation studies, nutrition and household management, agricultural and forestry science, building restoration, navigation and nautical science, and translation and interpretation.

   The duration of study at a Fachhochshule is eight semesters, six full study semesters at the institution itself and two practical semesters in an industrial firm or a public administration. A required part of the training is an extensive, independent, practice oriented dissertation, which usually takes between two and six months.

B. The Case for Lebanon

The Lebanese educational system has failed to respond to the continually evolving needs of Lebanese industries and the job market.

Admittedly, a number of schools have attained notably high standards, but they represent the exception to the rule. Feedback from all interviewed sources confirms what three separate studies have already concluded: Lebanon is facing a severe shortage of qualified technical workers.

1. The Proposed Amlieh Program

The Amlieh Technical School, a pioneer in technical and vocational education in Lebanon, is embarking upon an ambitious curriculum expansion plan that constitutes the first crucial step towards a stronger more dynamic vocational and technical education program.

This expansion plan is not the first challenge that Amlieh will undertake. In fact, the school's profile and history render it uniquely equipped to nurture this new endeavor into successful fruition.

Founded in Beirut in 1960, the Amlieh Technical School (ETSA) is one of Lebanon's leading vocational training institutes. Reconstruction of the school, which was destroyed in 1982 during the Israeli invasion, was completed in 1995 with the help of German donations.

Today, Amlieh offers various technical specializations at no tuition fees. The school's 1,725 student body follows two main programs: [13]

- ◊ A three year BT program equivalent to an academic high school degree (Lebanese Technical Baccalaureate).
- ◊ A three year TS program equivalent to one year less than a university bachelor degree.
- ◊ Private programs (see Appendix)

The Amlieh BT initiative was funded by the German government, whereas the TS program was financed by the French Ministry of Foreign Affairs and the French Region Midi Pyrenee in Toulouse.

The Amlieh has studied the German model and is proposing a Fachhochshule degree program that aims at bridging the widening gap between technical education and the needs of Lebanon's industrial sector.

The proposed Fachhochshule degree program will rest upon four main pillars:

a) Focused Specializations

The new program proposes two additional years of study, either after the third and final TS year or divided between the five summer vacations. Amlieh will launch the program with two core specializations: Energy Technics and Mechanical Engineering. The program will accept only students who have attained outstanding results in the TS level.

[13] 1996 figure.

Curricula will be constantly adapted to reflect technological advancements in the fields of specialization on offer, and Amlieh will recruit professional vocational trainers or train the existing ones on the latest teaching methods.

Here, it is worth mentioning that Amlieh already employs a cadre of teachers who are graduates of German Fachhochshulen and holders of the French DEA degree.

b) A Two Year Practical Training Course

An integral part of the program will be a two year practical and theoretical training course which students will undertake at the school for advanced theoretical training and at either the school's developed workshops or at one of Lebanon's industrial establishments for practical training. The course will be designed to provide students with intensive practical training, imbuing them with the necessary practical skills required by industries operating in their fields of specializations.

Students will be required to submit a project paper (a dissertation about their training course), which will form the basis for their overall grade for the graduating year.

c) A Formal Cooperative Effort Between the School and Lebanon's Many Industries

A mainstay of the new program will be a very close cooperative relationship with Lebanon's industrial establishments, with whom Amlieh will develop the one year practical training course.

The training course will be supervised by both Amlieh instructors and the industrial firm, according to formal, rigorous standards to which the student will have to adhere.

Here, it is worth mentioning that Amlieh is already one of the very few schools which have developed a long standing successful cooperation with many industries.

d) Fachhochshule Level Credentials

The new program will provide its students with credentials -- degree holders will be regarded and treated as practical engineers -- that represent a qualitative leap from the current TS program. This leap will not only carry students beyond the narrow focus of machine operation and maintenance chores (see specializations in next section), but will help them overcome the social stigma often associated with present technical degrees.

It is worth noting that the Lebanese parliament is currently studying a law that confers on "technical engineers and interior designers" the proper title of engineer. The law is expected to go into effect by November 1997.

2. The Specializations

Energy Technics

This specialization will be divided into two main stages: The Vordiplom (the first diploma or Baccalaureat Technique Superieur-BTS) and the Hauptidiplom (the main diploma).

The First Diploma: The first diploma will span three years, the primary aim of which will be to strengthen the students' theoretical knowledge and background in science courses. The following courses will be on offer:

- Metallurgy
- Mechanics
- Physics
- Mathematics
- Measurements
- Control engineering
- General electricity
- System technics
- Semi conductor technics
- Microelectronics.

The Main Diploma: The main diploma will span another two years, during which the following courses will be offered:

- Electricity generation
- Electricity transfer
- Electricity distribution
- Electricity usage
- Electrical energy
- Discipline
- Electromechanics
- High voltage techniques
- Energy supply
- Electronic production
- Alternative sources of energy

Upon graduation, students will be able to work in planning and management of production, inspection techniques, patent and license, supervision of the work place, scraptreatment issue, and surrounding observation.

Mechanical Engineering

The First Diploma: The first diploma will span three years, the primary aim of which will be to strengthen student's theoretical knowledge and background in science courses. The following courses will be on offer:

- Mathematics
- Physics
- Metallurgy
- Construction design
- Machine components
- Measurements
- Thermodynamics
- Electricity
- Computer

The Main Diploma: The main diploma will span two years during which the following specialized courses will be on offer:

- Automation
- Work and processing machines (machine tools)
- Construction technics (design and drawing)
- Production factory techniques
- Electricity
- Electronics
- Heat techniques

Upon graduation, students will be able to work in research and development, project planning and production, project construction and customer advisory services.

3. Reaction to Amlieh's Proposed Fachhochshule Program

Both interviewed companies and technical education experts agreed, without exception, that the new Amlieh program, if well executed, will represent a very significant initial step towards tackling the system's inherent deficiencies.[14]

Dr. Younis concurred that the program builds upon his own recommendations for a *Dual Education System* and addresses the system's most glaring gaps: student's weak backgrounds in science courses, students' minimal practical training, outmoded curricula and workshops and schools' almost total lack of coordination with industry.

[14] (t should be stressed that interviewed companies were not given the name of Amlieh or the actual name of the program. Interviewers shared only the details of the program itself, to avoid any leading discussions which might bias interviewee's response.

Equally significant was feedback from holders of Fachhochshule degrees (9 were interviewed for this study). All those interviewed proposed that Amlieh will be instrumental in helping society and technical education students alike overcome their current social prejudice against technical education. This feedback is consistent with the remarks made by those interviewed companies which have recruited Fachhochshule degree holders. These companies indicated that while they were not familiar with Fachhochshule at the time of recruitment they were impressed with the German connection and even more impressed with the recruit's technical skills and practical experience. In fact, all these companies recruited Fachhochshule degree holders as engineers and gave them the salary commensurate with that position.

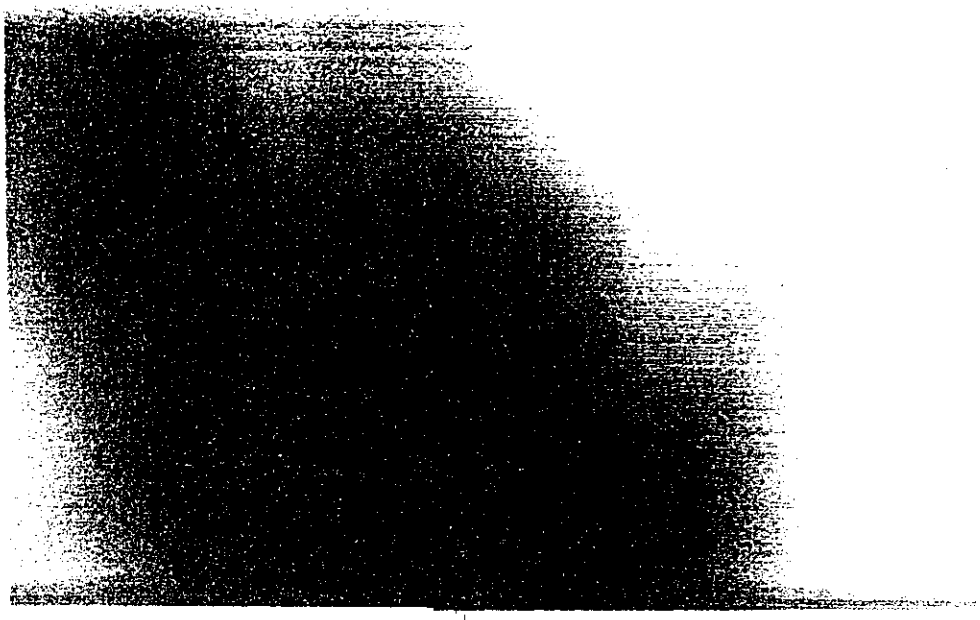
Moreover, companies highlighted several specific benefits which they expect the new program will offer them:

1. Highly qualified technical "engineers" whose credentials will bring in badly needed practical or "applied "skills which are far more sophisticated than the machine oriented capacities of TS graduates, and which "academic" engineers do not have.
2. Technical workers who have trained on the technology used by the industry, and hence have acquired specializations unique to it.
3. Stronger, more effective, in-house training programs developed by these new "engineers" for low level technical workers.

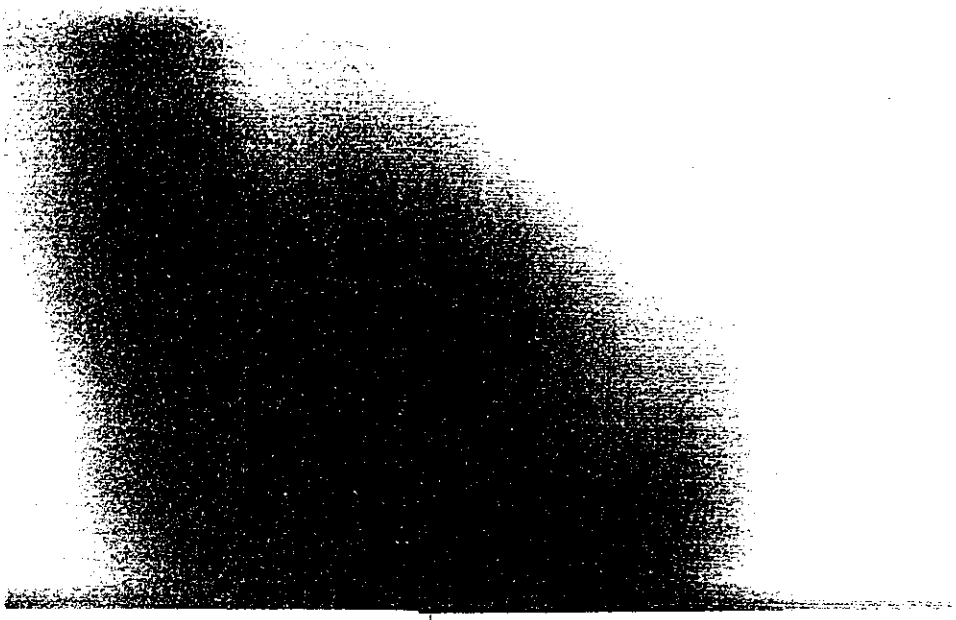
Interviewed companies stressed, however, that in view of Lebanon's underdeveloped industrial sector, and in order for the student to gain maximum benefit from his practical training, the program should concentrate its practical courses in those fields with the larger industries which have serious potential for growth.

Date of the Proposed Program's Launch

The Amlieh school plans to launch the new program in the 1997-1998 academic year.



Appendixes



Geography of Lebanon

Total Area: 10,400 sq km (6,464 sq mi)

Land Area: 10,230 sq km (6,358 sq mi)

Comparative Area: About 0.8 times the size of Connecticut

Boundaries: 454 km (282 mi); Israel 79 km (49 mi), Syria 375 km (233 mi)

Coastline: 225 km (140 mi)

Terrain: Narrow coastal plain; Al Biqa' (Bekaa Valley) separates Lebanon and Anti-Lebanon Mountains

Climate: Mediterranean; mild to cool, wet winters with hot, dry summers

Natural Resources: Limestone, iron ore, salt, water-surplus state in a water-deficit region

Maritime Claims: Territorial sea: 12 nm

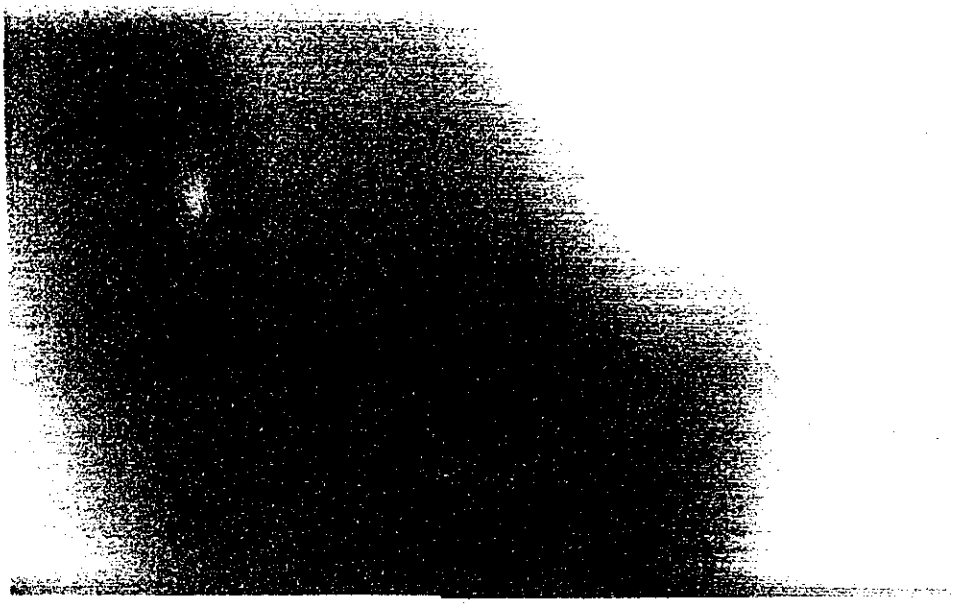
Disputes: Separated from Israel by the 1949 Armistice Line; Israeli troops in southern Lebanon since June 1982; Syrian troops in northern Lebanon since October 1976

Environment: Rugged terrain historically helped isolate, protect, and develop numerous factional groups based on religion, clan, ethnicity; deforestation; soil erosion, air and water pollution; desertification

Note: Nahr al Litani only major river in Near East not crossing an international boundary

Land Use: Arable land 21%; permanent crops 9%; meadows and pastures 1%; forest and woodland 8%; other 61%; includes irrigated 7%

Deforestation Rate: 0 annual rate of change of forests and woodland area.



Government of Lebanon

Capital: Beirut

Type: Republic

Long Form of Name: Republic of Lebanon; note - may be changed to Lebanese Republic

Independence: 22 November 1943 (from League of Nations mandate under French administration)

Administrative Regions: 5 governorates (muhafazat, singular - muhafazah); Al Biqa', Al Janub, Ash Shamal, Bayrut, Jabal Lubnan

Constitution: 26 May 1926 (amended)

National Holiday: Independence Day, 22 November (1943)

Legal System: Mixture of Ottoman law, canon law, Napoleonic code, and civil law; no judicial review of legislative acts; has not accepted compulsory ICJ jurisdiction

Executive Branch: President, prime minister, Cabinet, note - by custom, the president is a Maronite Christian, the prime minister is a Sunni Muslim, and the speaker of the legislature is a Shi'a Muslim

Legislative Branch: Unicameral National Assembly (Arabic - Majlis Alnuwab, French - Assemblee Nationale)

Judicial Branch: Four Courts of Cassation (three courts for civil and commercial cases and one court for criminal cases)

Suffrage: Compulsory for all males at age 21; authorized for women at age 21 with elementary education

Leaders: Chief of State: President Ilyas HARAWI (since 24 November 1989), Head of Government Prime Minister Rafiq al-HARIRI

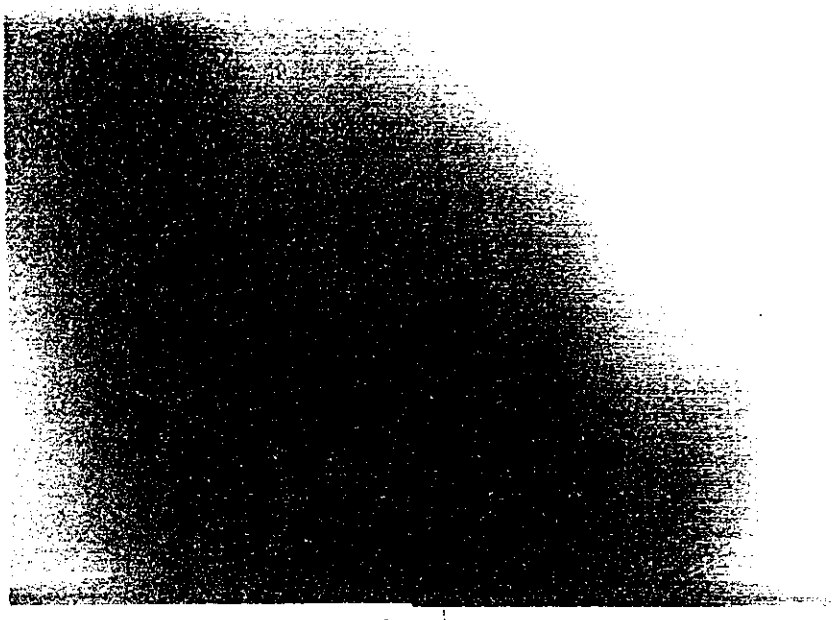
Political Parties: Political party activity is organized along largely sectarian lines; numerous political groupings exist, consisting of individual political figures and followers motivated by religious, clan, and economic considerations.

Elections: National Assembly, elections should be held every four years, but security conditions have prevented elections since May 1972; in 1992 the first election in 20 years was held to elect 128 representatives in the parliament.

Military Branches: Lebanese Armed Forces (LAF) (including Army, Navy, and Air Force)

Manpower Availability: Males 15-49, 750,319; 465,938 fit for military service

Int'l Org. Membership: ABEDA, ACCT, AFESD, AL, AMF, CCC, ESCWA, FAO, G-24, G-77, IAEA, IBRD, ICAO, ICC, ICFTU, IDA, IDB, IFAD, IFC, ILO, IMF, IMO, INTELSAT, INTERPOL, IOC, ITU, LORCS, NAM, OIC, PCA, UN, UNCTAD, UNESCO, UNHCR, UNIDO, UNRWA, UPU, WFTU, WHO, WIPO, WMO, WTO



Economy of Lebanon

GDP: Exchange rate conversion - $11 billion, per capita $3,098 (1995 est.)

Labor Force: industry, commerce, and services 79%, agriculture 11%, government 10% (1985)

Imports: $7.303 billion (c.i.f., 1995 est.)

Exports: $824 million (f.o.b., 1995 est.); commodities: agricultural products, chemicals, textiles, precious and semiprecious metals and jewelry, metals and metal products.

Budget: Revenues $2.5 billion; expenditures $4.0 billion (1995 est.)

Unemployment Rate: 17% (1995 est.)

External Debt: $1.2 billion (1995)

Electricity Production: 4,823,000 kWh produced, 1,358 kWh per capita (1995)

Industries: Banking, food processing, textiles, cement, chemicals, jewelry, some metal fabricating

Agriculture: Accounts for about 15% of GDP, principal products-citrus fruits, vegetables, potatoes, olives, tobacco, hemp (hashish), sheep and goats; not self-sufficient in grain

Forest products imported (US $): 40,872,000

Forest products exported (US $): 13,000

Patents Granted, 1992: 1

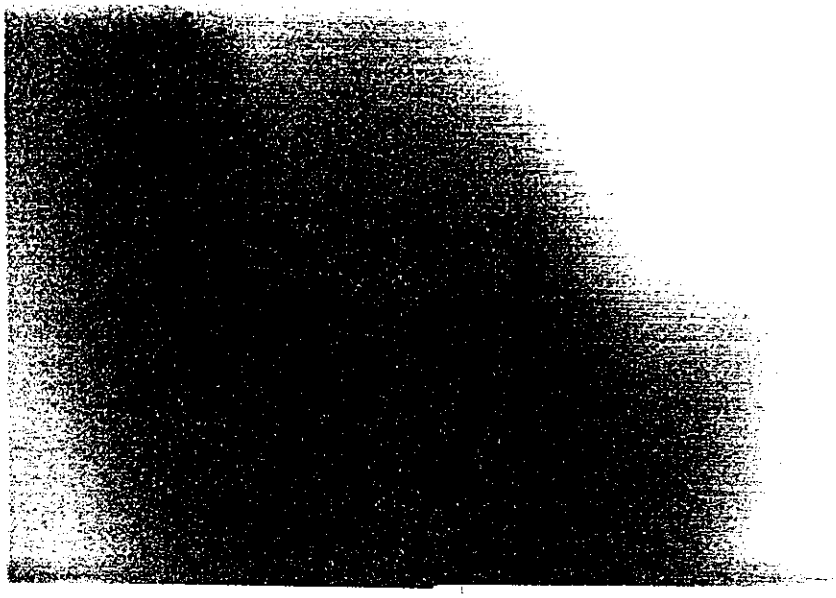
Economic Aid: US commitments, including Ex-Im (FY70-88), $355 million; Western (non-US) countries, ODA and OOF bilateral commitments (1970-89), $664 million; OPEC bilateral aid (1979-89), $952 million; Communist countries (1970-89), $9 million

Exchange Rates: Lebanese pounds (£L) per US$1 - 1598.00 (December 1995)

Specializations Offered at the Leading Technical Schools in Lebanon

	Institut Byblos	Centre International de Technologie	Islamic Technical Center	Hussein Ibn Ali	CEC	Mont La Salle	Abdel Hadi Al Dibs Center (Makassed)	Amlieh
Special Diplomas					n/a			
								X
Industrial Specializations								
Air Conditioning	X							
Automobile Electronics	X						X	X
Automobile Mechanics and Electricity	X	X	X				X	
Electrical Installations								X
Industrial Electrical Installations								X
Domestic Electrical Installations				X				
General Electronics	X	X						
Etudes et Execution des Panneaux Publicitaires	X							
General Electricity	X	X	X	X				X
Radio and TV Technician		X	X				X	
Sanitary Products Technician								X
Metal Welding								X
Metal Turning								X
Carpenter								X
Industrial Mechanics								X
Winding of Electrical Machines								X
Computerized Mechanics								
Computerized Electricity								
Para-Technical Specializations		X						X
Architecture Design								
Architectural Drawing		X						
AUTOCAD - ORCAD		X						
Book Keeping		X		X				
Chief Accountant	X	X			X			
Computer Operator and Programmer								
English Language	X							
Entrepreneur de Travaux de Construction	X	X					X	
Fashion Design								
Furniture Design	X	X						
General Accountant		X						
Hair Dressing		X						
Interior Design					X			
Jewelry Design		X		X	X			
Languages		X						
Make-up								

	Institut Byblos	Centre International de Technologie	Islamic Technical Center	Hussein Bin Ali	CEC	Mont La Salle	Abdel Hadi Al Oibs Center (Makassed)	Amlieh
Para-Technical Specializations-cont'd								
Maquettiste	X							
Music		X						
Promotion Immobiliere	X							
Secretariat	X	X						
Ticketing				X				
Topography		X						
Typewriting	X	X						
BP					n/a			
Assistant Accountant		X						
Building Electrician		X	X					
Motor Mechanics			X					
FPM								
Commercial Sciences	X							
Computer	X							
Electronics	X							
BT							X	X
Air Conditioning								X
Architecture Design		X					X	X
Car Mechanics		X	X					
Commercial Sciences	X	X		X			X	
Construction			X					
Electricity		X	X	X			X	X
Electronics	X	X	X	X			X	X
Industrial Mechanics	X		X				X	X
Interior Design		X						
Music		X						
Programming and Business Computer	X	X	X	X				
Secretariat		X						
TS				X		X	X	
Accounting		X		X				
Banking Sciences		X						
Civil Engineering - Topography		X	X					
Commercial Sciences					X			
Computer Science		X			X	X	X	X
Electricity		X	X					
Electronics	X	X	X	X	X	X		X
Fashion Design		X						
Interior Design		X			X		X	
Mechanics							X	X
Programming and Business Computer	X		X	X				



BT

Number of students who presented the official exam

	1991	1992	1993	1994	1995	1996
Industrial Specializations						
Air conditioning	99	78	75	94	48	69
Car mechanics	99	133	142	137	114	142
Electricity	473	517	510	545	332	508
Electronics	505	546	733	890	580	681
Industrial chemistry	31	28	27	37	52	29
Architectural drawing	140	130	132	139	122	178
Industrial Mechanics	208	226	229	243	180	157
Airplane mechanics	24	18	15	16	31	21
Subtotal	1,579	1,676	1,863	2,101	1,459	1,785
Paratechnical Specializations						
Commercial science	1,335	1,516	1,891	2,094	2,303	2,206
Secretariat	152	163	189	206	208	168
Programming	433	743	1,181	1,282	1,332	1,591
Subtotal	1,920	2,422	3,261	3,582	3,843	3,965
Total	3,499	4,098	5,124	5,683	5,302	5,750

Number of students who passed the official exam

	1991	1992	1993	1994	1995	1996
Industrial Specializations						
Air conditioning	20	23	14	25	46	62
Car mechanics	29	28	64	72	105	104
Electricity	125	153	131	168	154	246
Electronics	147	224	260	303	253	316
Industrial chemistry	13	20	10	11	38	17
Architectural drawing	72	75	66	60	64	113
Industrial Mechanics	50	64	53	84	113	98
Airplane mechanics	14	15	10	16	27	20
Subtotal	470	602	608	739	800	976
Paratechnical Specializations						
Commercial science	503	614	818	475	738	1,088
Secretariat	103	99	153	150	143	132
Programming	202	370	420	395	324	859
Subtotal	808	1,083	1,391	1,020	1,205	2,079
Total	1,278	1,685	1,999	1,759	2,005	3,055

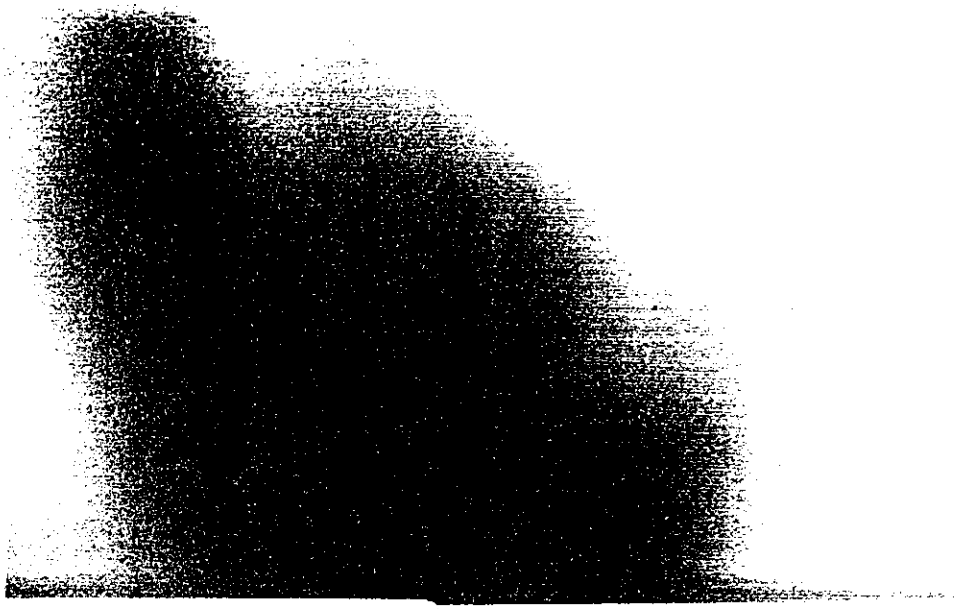
TS

Number of students who presented the official exam

	1991	1992	1993	1994	1995	1996
Industrial Specializations						
Civil engineering	65	21	35	16	16	31
Electricity	72	23	32	31	54	41
Electronics	303	270	280	211	202	221
Mechanics	29	25	23	24	29	40
Airplane mechanics	0	0	0	0	0	19
Optical instruments	0	0	0	0	29	56
Subtotal	469	339	370	282	330	408
Paratechnical Specializations						
Accounting and auditing	544	420	378	274	291	329
Interpretation and secretarial	15	10	0	12	14	33
Business computer	861	754	728	555	605	627
Subtotal	1,420	1,184	1,106	841	910	989
Total	1,889	1,523	1,476	1,123	1,240	1,397

Number of students who passed the official exam

	1991	1992	1993	1994	1995	1996
Industrial Specializations						
Civil engineering	18	12	22	8	5	16
Electricity	12	6	2	9	18	19
Electronics	113	103	41	33	85	98
Mechanics	15	9	14	9	8	19
Airplane mechanics	0	0	0	0	0	17
Optical instruments	0	0	0	0	27	36
Subtotal	158	130	79	59	143	205
Paratechnical Specializations						
Accounting and auditing	105	111	110	34	63	124
Interpretation and secretariat	12	9	0	9	8	24
Business computer	75	386	418	228	195	309
Subtotal	192	506	528	271	266	457
Total	350	636	607	330	409	662



Number of Registered Students in the Interviewed Private Schools in 1995

TS	
Name of School	Number of Students
Mont La Salle	74
Houssein Bin Ali Institute	140
Abdel Hadi El Dibs Technical Center	0
Computer & Electronic Center	n/a
Centre Internationale des Sciences Techniques	n/a
Institut Byblos	n/a
Islamic Technical Institute (1996)	207
Amlieh Technical School (1996)	201

BT	
Name of School	Number of Students
Mont La Salle	14
Houssein Bin Ali Institute	310
Abdel Hadi El Dibs Technical Center	137
Computer & Electronic Center	n/a
Centre Internationale des Sciences Techniques	n/a
Institut Byblos	n/a
Islamic Technical Institute (1996)	625
Amlieh Technical School (1996)	1464

Specializations Offered at German Fachhochschulen in 1995

Fächer-Studiengänge	Subjects/Courses
Landbau/Landwirtschaft	Agriculture/agronomy
Landespflege	Landscape maintenance
Landmaschinentechnik	Farm machine engineering
Landschaftsnutzung und Naturschutz	Land use and protection of the natural environment
Lebensmitteltechnologie	Food technology
Logistik	Logistics
Luftfahrzeugtechnik	Aeronautics engineering
Maschinenbau	Mechanical engineering
Maschinenbauinformatik	Computing in mechanical engineering
Mathematik	Mathematics
Medieninformatik	Computing in media applications
Medientechnik	Media techniques
Medienwirtschaft	Media management
Medizinische Informatik	Medical computer science
Medizintechnik	Medical technology
Meßtechnik	Measurement technique
Metallbau	Metal construction
Mikroelektronik	Microelectronics
Mikrosystemtechnik	Microsystems engineering
Milch- und Molkereiwirtschaft	Dairy science
Modedesign	Fashion design
Museumskunde	Museology
Musiktherapie	Music therapy
Nachrichtentechnik	Telecommunications engineering
Optoelektronik	Optoelectronics
Pflege und Gesundheit	Care and health studies
Pflegepädagogik	Nursing education
Pharmatechnik	Pharmaceutical engineering
Pharmazeutische Chemie	Pharmaceutical chemistry
Physikalische Technik	Engineering physics
Produkt Design	Product design
Product Engineering	Product engineering
Produktionstechnik	Production engineering
Religionspädagogik	Religious education
Recycling	Recycling
Restaurierung	Restoration
Schiffbau	Ship building
Schiffsbetriebstechnik	Ship operations engineering
Seefahrt/Nautik	Navigation/Nautics
Seeverkehr- und Hafenwirtschaft	Sea traffic and harbour management
Sensortechnik	Sensory technology
Sozialarbeit	Social work
Sozialpädagogik	Social Education
Sozialwesen	Social services
Sprachen, Angewandte	Applied languages
Stahlbau	Steel construction engineering
Steine und Erden	Non-metallic minerals
Techn. Betriebswirtschaftslehre	Industrial business management
Technische Gebäudeausrüstung	Technical supply and equipment of buildings
Technische Informatik	Computer engineering

Annex

Fächer-Studiengänge	Subjects/Courses
Agrarmarketing und -management	Agricultural marketing and management
Architektur	Architecture
Außenwirtschaft	Foreign trade
Automatisierungstechnik	Automation engineering
Baubetrieb	Building site operations
Bauinformatik	Computer science for building applications
Bauingenieurwesen	Civil engineering
Bauphysik	Constructional physics
Bekleidungs-/Textiltechnik	Garment and textile engineering
Bergbau	Mining
Betriebstechnik	Operations engineering
Betriebswirtschaft	Business administration
Bibliotheks- und Dokumentationswesen	Library administration and documentation
Chemie	Chemistry
Chemieingenieurwesen	Chemical engineering
Design/Gestaltung	Design
Druckereitechnik	Printing technology
Elektrische Energietechnik	Electric energy engineering
Elektrotechnik	Electrical engineering
Ernährung und Hauswirtschaft	Food and home economics
Ernährungs- und Haushaltstechnik	Food and home technology
Europäische Betriebswirtschaft	European business administration
Fahrzeugtechnik	Vehicle engineering
Feinwerktechnik	Precision engineering
Fernsehtechnik	Television techniques
Fertigungssysteme	Manufacturing systems
Forstwirtschaft	Forestry
Fotoingenieurwesen	Photographic engineering
Gartenbau	Horticulture
Geotechnik	Geoengineering
Getränketechnologie	Beverage engineering
Grafik-Design	Graphic design
Heilpädagogik	Orthopedagogy
Holztechnik	Wood engineering
Hütten- und Gießereitechnik	Metallurgical and foundry engineering
Industrieautomation	Industrial automation techniques
Industriedesign	Industrial design
Industrieelektronik	Industrial electronics
Informatik	Computer science
Ingenieurinformatik	Engineering computer science
Innenarchitektur	Interior architecture
Kartographie	Cartography
Keramik/Glastechnik	Ceramics/Glass engineering
Kerntechnik	Nuclear engineering
Kirchliche Bildungsarbeit	Ecclesiastical educational work
Kommunikationsdesign	Communications design
Kommunikationstechnik	Communications engineering
Konstruktiver Ingenieurbau	Structural engineering
Krankenpflege	Nursery/Care
Krankenpflegemanagement	Care management
Kunststofftechnik	Plastics engineering

Annex

Fächer-Studiengänge	Subjects/Courses
Technischer Redakteur	Technical editor
Technisches Gesundheitswesen	Health Engineering
Übersetzen und Dolmetschen	Translating and interpreting
Textil-Design	Textile design
Theater- und Veranstaltungstechnik	Theatre and show technics
Touristik	Tourism
Transportwesen	Transport systems
Übersetzen und Dolmetschen	Translating and interpreting
Umwelttechnik	Environmental engineering
Ver- und Entsorgungstechnik	Supply and waste engineering
Verfahrenstechnik	Process engineering
Verkehrsbetriebswirtschaftslehre	Transport management
Verkehrstechnik	Transports engineering
Verlagsherstellung	Publishing and printing
Vermessungswesen	Surveying
Verpackungstechnik	Packaging
Versicherungswesen	Actuarial science
Visuelle Kommunikation	Visual communications
Wasser- und Abfallwirtschaft	Water supply and waste management
Wasserbau und Kulturtechnik	Water engineering and crop production engineering
Weinbau	Viniculture
Werkstofftechnik	Materials engineering
Wirtschaft	Economics
Wirtschaftinformatik	Business computer science
Wirtschaftsingenieurwesen	Industrial engineering
Wirtschaftskommunikation	Management communications

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