DOCUMENT RESUME

ED 043 785 24 VT 011 965

AUTHOR Al-Bukhari, Najati Mohammed Amin
TITLE Issues in Occupational Education and Training: A Case Study in Jordan.
INSTITUTION Stanford Univ., Calif. Stanford International Development Education Center.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO BR-6-2597
PUB DATE 68
CONTRACT OEC-4-7-062597-1654
NOTE 194p.
AVAILABLE FROM Publications Secretary, SIDEC, School of Education, P.O. Box 2329, Stanford University, Stanford, California 94305

EDRS PRICE EDRS Price MF-$0.75 HC-$9.80
DESCRIPTORS Articulation (Program), Cost Effectiveness, Educational Finance, *Educational Programs, Expenditure Per Student, Followup Studies, *Foreign Countries, General Education, Graduate Surveys, *Manpower Needs, On the Job Training, *Program Effectiveness, Secondary Schools, *Trade and Industrial Education, Vocational Followup
IDENTIFIERS *Jordan

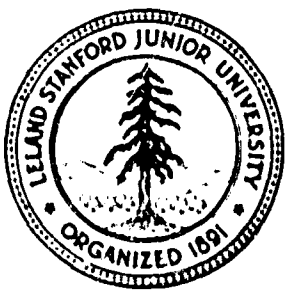
ABSTRACT

To investigate and analyze the role of Jordanian secondary industrial schools in meeting manpower needs and to determine the relative costs and effectiveness of occupational preparation through industrial schools as compared with general schooling or on-the-job training, followup questionnaires were mailed to 352 graduates from two industrial schools. The response revealed that 194 graduates were employed in Jordan, and 90 of these were selected for further interviews. In addition, 72 work-companions and 58 workers doing the same tasks were interviewed. Findings concerning the utilization of the industrial school curriculum suggest that the more specific the training, the less its likelihood of being relevant to actual job-related needs. Therefore, the educational system should put less emphasis on specific training and more emphasis on producing readily trainable, rather than specifically trained, persons. Also, a large share of future government investment should be used to expand and improve training opportunities within the employment system. An occupational upgrading program is needed in the private industrial establishments and well organized programs should be established for public industries. An Occupational Training Organization should be set up to articulate the program. A related document is available as VT 011 966. (SB)

ISSUES IN OCCUPATIONAL EDUCATION AND TRAINING: A CASE STUDY IN JORDAN

by Najati Mohammed Amin Al-Bukhari

OET-3



a publication of the

STANFORD INTERNATIONAL DEVELOPMENT EDUCATION CENTER (SIDEC)

SCHOOL OF EDUCATION

STANFORD UNIVERSITY

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The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare, Contract No. OEC-4-7-062597-1654.

Stanford International Development Education Center (SIDEC)

School of Education

Stanford University

Stanford, California, U. S. A.

1968

SIDEC STUDIES ON CONTENT AND METHODS OF EDUCATION FOR DEVELOPMENT

Sub-series on Occupational Education and Training

OET-1. Planning Occupational Education and Training for Development, by Eugene Staley. 1968.

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FOREWORD

by Eugene Staley

In this study on alternative pathways of education and training by which young Jordanians acquire certain types of modern industrial skills, Dr. Najati Al-Bukhari adds to our understanding of some puzzling and controversial issues in development education. What should be the respective roles of the school system and of the employment system in preparing people for jobs? Does highly specific training in vocational secondary schools pay off, or is it likely to be wasted? What about the comparative costs and effectiveness of specific vocational schooling versus a more general secondary education followed by specific training in employing establishments?

With questions like these in mind, Dr. Al-Bukhari has carefully investigated the education, training, and employment experience of a sample of graduates of the industrial secondary schools in Jordan and, for comparison, "work companions" of these graduates who are performing similar jobs in the same employing establishments but have come through the general schools. He finds that the specific skills learned in industrial secondary schools are being used in their current jobs by only a minority of the graduates. Specific theory is somewhat more frequently used, general skills still more, and general theory most of all. While the costs of the industrial secondary schools per student year and per student successfully graduated are substantially higher than comparable costs of the general secondary schools, there appears to be no substantial difference in the earnings of graduates in similar employments. The amount of supplementary training required after employment is about the same. On grounds of trainability and flexibility, some employers prefer graduates of the general secondary schools, partly because these have more foundation in such fields as chemistry.

This is the third in a group of studies on occupational education and training as related to development produced as part of the SIDEC research program on "Content and Methods of Education for Development." As explained by Professor Paul R. Hanna, Director of SIDEC, in a foreword introducing the first publication in the series, the aim of the research program is to throw light on a set of problems central to education's role in modernization and development. What educational content is most relevant to and most likely to assist in obtaining desired types of economic-social-political development--especially in, but not limited to, the newly developing nations? The focus of the series, in other words, is on the curriculum problem viewed from the standpoint of requirements of development in a national community or in other larger or smaller scale communities of men. Three sectors of this broad problem are currently being emphasized: Occupational Education and Training, Education's Role in the Formation of Social and Civic Attitudes, and Education's Role in the Rural-Urban Transformation. A list of the studies already issued or about to be issued appears on page ii.

This three-pronged series of studies, including the present one on the role of industrial secondary schools in Jordan, is made possible by a research contract between the Office of Education, Department of Health, Education, and Welfare, United States Government, and Stanford University.

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INTRODUCTION

Issues in Occupational Education and Training

Experts of different disciplinary and professional backgrounds have attempted to tackle the problem of providing occupational education and training for the middle-level manpower required to meet the present and projected development needs of industry in developing countries. Among those who have contributed to the discussion of this problem are professional educators, economists and administrators. Some have described or evaluated existing practices;[1] others have proposed modifications to what is now practiced or have suggested new lines of action;[2] still others have offered an integrated model for the organization of occupational education and training, or evaluated the theoretical foundations of existing practices.[3]

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[1]Frederick Harbison and Charles A. Myers, Manpower and Education, Country Studies in Economic Development (New York: McGraw-Hill Book Co., 1965); Gertrude Williams, Apprenticeship in Europe, the Lesson for Britain (London: Chaoman & Hall, 1963); A. J. Corazzini, Vocational Education, A Study of Benefits and Costs, A Case Study of Worcester Mass. (Princeton University, 1966).

[2]Frederick Harbison and Charles A. Myers, Education, Manpower, and Economic Growth (New York: McGraw-Hill Book Co., 1964); Philip J. Foster, "The Vocational School Fallacy in Development Planning," Education and Economic Development, ed. C. Arnold Anderson and Mary Jean Bowman (Chicago: Aldine Publishing Company, 1965).

[3]Frederick Harbison, "Towards a More Integrated Analysis of Opportunities for Assistance to Developing Countries in the Development and Utilization of Human Resources" (mimeographed) (Washington:

The question of manpower training is as complex as it is important, and particularly so for developing countries, which lack resources. Those concerned with the problem must first identify or assign the functions of the educational and employment systems by considering not only the manpower requirements, present and future, and the hiring and training practices of the employing establishments, but also the educational and employment needs of the students. How are these related? To what extent can aspects of occupational education and training be assigned to one or the other system or to what extent are they a function of both? A policy that coordinates the roles and functions of the two systems must be established. Such a policy would aim for more effective preparation of young workers, the avoidance of duplication of efforts, and the most efficient division of functions.

The attempt to identify functions immediately raises the question of whether, in the field of occupational education and training, the educational system should be concerned mainly with supplying a broad general education and some pre-occupational education and training, or whether it should also be concerned with providing specific occupational training.[4] The existing practice

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American Council of Education, U. S. A. State Department Seminar, 1967); Eugene Staley, Planning Occupational Education and Training for Development (Stanford International Development Education Center (SIDEC), School of Education, Stanford University, 1967).

[4]Harbison and Myers, Education, Manpower, and Economic Growth, p. 56; Staley, op. cit., p. 3-3.

in several countries is to have two types of secondary schools, one general for those who plan to pursue higher education and the other vocational for those who plan to terminate their education. The vocational secondary school provides its clientele with specific skills needed for the various trades. Other countries have only one type of secondary school, the comprehensive or multi-purpose secondary school, in which both general and pre-occupational education are offered. In such countries the provision of specific skills is left to the employment system.[5] The assignment of specific skill training to the employment system is based on the idea of relating occupational training more specifically to ongoing economic activities.[6] There are some cases in which the employment system also provides opportunities for further education in both technical and general education.[7] The content of the general education curriculum has been much discussed[8] recently. Current literature emphasizes the importance of language,

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[5]James Bryant Connant, The American High School Today: A First Report to Interested Citizens (New York: McGraw-Hill Book Co., 1959), p. 58; Franklin Jefferson Keller, The Comprehensive High School (New York: Harper and Brothers, 1955), p. 18.

[6]See Foster, op. cit., p. 156.

[7]See Mohammed Ennaceur, "Tunisian Experience in Adaptation of Technical Education and Occupational Training to Employment Market Needs, A paper prepared for the Workshop on Occupational Education and Training for Development, SIDEC, Stanford University, (Tunis, 1967).

[8]See Harbison and Myers, Education, Manpower, and Economic Growth, p. 96. See Staley, op. cit., pp. 2-6.

mathematics, and the natural and social sciences in general education at the secondary level. There are many claims that products of such programs are more trainable, versatile, adaptable, and flexible than products of specific vocational programs.

The issues that need to be confronted are: where to provide specific education and training; whether the school should only be concerned with general education and some pre-occupational education or should also be concerned with specific training; and whether the employment system should undertake specific training and also perhaps offer provisions for further education. The settlement of such issues will lead to a balanced division of functions and a coordination of efforts between the employment system and the educational system.

Issues as Related to Jordan

The foregoing discussion is relevant to the situation in Jordan, where the trend has been to put most of the burden of the specific training for middle-level manpower requirements onto the educational system. The Ministry of Education in Jordan believes that the secondary industrial school is the institution that meets the needs of industry for middle-level skilled workers.[9] For this reason three secondary industrial schools were built recently in

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[9]Ministry of Education, Jordan, Law of Education, 1964 (Amman: Ministry of Education Publication, 1965), p. 20.

Irbid, Nablus, and Jerusalem since 1960.[10] There had already been one in Amman.

There is another reason for the establishment of these secondary industrial schools. The Ministry of Education is convinced that the establishment of more industrial schools will help solve the problem of unemployment that has existed among the secondary general school graduates. The implicit assumption is that secondary industrial school graduates have a better chance of getting employment than the secondary general school graduates.[11]

This basic assumption, however, is open to some question. The Ministry of Education in Jordan presently is involved in a study to evaluate and reorganize vocational education, including the secondary industrial schools. Since only 2% of the total number of students in the three-year higher secondary education program are in secondary industrial schools, the government is considering the possibility of increasing the number of industrial schools.[12]

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[10]Ministry of Education, Jordan, Annual Report, 1965/66 (Amman: Ministry of Education Publication, 1966), p. 222.

[11]Ministry of Education, Jordan, Circular No. 3/114/13803.

[12]Ministry of Education, Jordan, Higher Curriculum Commission Working Papers on Secondary Education, 1967.

Purpose of the Present Study

The purpose of the present study is to investigate and analyze the role played by the public secondary industrial schools in Jordan in meeting the middle-level manpower needs of the employment system and to gain some idea of the relative costs and effectiveness of occupational preparation through the industrial schools as compared with general schooling plus training in employing establishments. It is hoped that this case study will contribute to an understanding of the issues involved in this question not only in Jordan but to some extent in other developing countries as well.

In order to define the optimum role of the educational system, this research project studies interactions among the three principle elements:

1. The training institutions: their aims, official programs, curricular contents, classroom and workshop activities, relations with employing establishments, opinions of teachers and principals, guidance and placement activities, and cost and benefit analysis.

2. The students of the training institutions: their aspirations, origins, job-finding efforts after graduation, efforts to pursue higher education.

3. The employing establishments: their recruitment and training practices and their employment needs.

Specific Aims of the Study

In more specific terms, the study attempts to answer the following questions:

1. What are the present functions of the secondary industrial schools?

Goals define functions. Accordingly, the study of functions will require the analysis of the stated official aims and the implicit aims, as viewed by the students, teachers, principals, and officials of the Ministry of Education. The curricula and the educative and training processes through which the schools prepare the students to perform the functions are investigated and analyzed. The study attempts to evaluate the curricular contents in relation to the recruitment and training practices of the employment system.

2. What interactions does the school have with the employing establishments as a means of preparing its students to perform well in their future occupational roles?

In addition to giving work experiences to the students, contact between the school and the employing establishments helps the school to determine its real functions. Feedback from students who are already employed is also relevant. Their experiences from graduation to getting a job and their performances on the job are or should be of importance in the continual shaping of the curriculum.

3. What are the aspirations of the students of the secondary industrial schools?

There is little evidence to indicate that vocational aspirations of students are governed to any great extent by the kind of education they receive. At the same time, other evidence suggests that their aspirations determine to a certain extent what happens to students after graduation.[13] Thus, if the stated aim of the schools is to prepare skilled workers for industry and it is found that after graduation students are planning something else, then a reevaluation of the stated functions of the industrial schools may be called for.

4. What happens to the graduates immediately after graduation?

To see if the school is functioning well in relation to real needs of the employment system, it is important to know about the period between graduation and finding a job and the extent to which graduates change the place of their work.

5. What percentage of the graduates work out of Jordan?

It is the contention of this researcher that the educational system should be judged on the basis of whether it serves the development needs of the country's employment system. This is the main function of the secondary industrial schools. A student is supposedly trained in the school to be a member of the labor force

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[13]Philip J. Foster, Education and Social Change in Ghana (Chicago: University of Chicago Press, 1965), p. 260.

in the employing establishments of his country. If it is found that a considerable number of graduates look for work or actually work abroad, then we should seek explanations for this phenomenon.

6. Do any of the graduates seek employment in clerical jobs after having been trained in specific skills?

It is frequently contended that graduates of general schools and, to a lesser extent, those of the industrial schools seek employment in clerical jobs. The researcher will examine this belief with relation to industrial school graduates.

7. Are there industrial school graduates who seek higher education?

There might be industrial school graduates who, after passing the general Public Secondary Examination, pursue higher education. Such graduates have an aim different from that of the school. In effect, they are introducing a new aspect to the functions of the industrial school.

8. What are the recruitment practices of the employment system, and to what extent do they influence the educational system?

It is reasonable to assume that employers have fairly well defined specifications in mind for persons who are to perform certain jobs and that they attempt to hire accordingly. Thus, industry, through its recruitment practices, dictates needs, and the educational system should meet these needs. In other words, the educational system cannot impose products that are not marketable.

9. What are the training practices of the employment system?

It is hypothesized that all industrial establishments in Jordan employ some workers for their middle-level job requirements who have not had any pre-employment specific training. What formal and informal training practices are used to provide specific job training for recruits? Job-entry training is the focus of investigation and analysis. The aim here is to learn how a worker is trained for his specific job and then how this training compares with the training provided in the institutions of the educational system. Does it cost more or less? Is it more or less timesaving? Does it give results that are equal, better, or worse?

Does a graduate of an industrial school also undergo this job-entry training when he first enters employment? If he does, then is his specific training in a certain trade in the school of any assistance in the process of job-entry training? What does the training officer think of those workers who come from the industrial schools as compared with those who do not?

10. What methods of providing occupational education and training are best in terms of benefits and costs?

Many lines of action leading to an objective are normally available for a decision maker. Education involves many situations in which a decision has to be made as to which alternative to put into practice to achieve a certain aim. The issue here is to

compare in terms of benefits and costs to the individual and society the various possibilities for provision of occupational training to meet middle-level manpower requirements of the employment system. Specifically, how do the costs and benefits of producing secondary industrial school graduates compare with those of producing secondary general school graduates who perform the same tasks? How do these compare with the costs and benefits of a worker who has less than the full six year secondary education?

CHAPTER I

THE METHODOLOGICAL APPROACH

Jordan has three systems for vocational training: the secondary industrial schools of the Ministry of Education, the UNRWA (United Nations Relief and Works Agency) vocational centers for the Palestinean refugees, and the philanthropic private system of craft training centers. The empirical research in this project is limited to the system of the Ministry of Education. However, a brief analysis of the other two systems is presented in Chapter II.

The Selection of Schools

There are four secondary industrial schools in Jordan. Since 1960 three new schools have been established; the fourth is an old one.[1] One of the three new schools, Jerusalem, does not have graduates yet, so it was excluded. The research began with the three remaining schools, but one of them was later excluded because it came to be located in the occupied territory of Jordan as a result of the hostilities of 1967 in the Middle East. Thus only two schools are included in the research project (Table 1-1).

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[1]Ministry of Education, Jordan, Annual Report, 1965/66 (Amman: Ministry of Education, 1966), p. 222.

Table 1-1

Secondary Industrial Schools and Graduates for 1963/1964, 1964/1965, 1965/1966

Schools	Included or Excluded	No. of Graduates
Amman	Included	181
Irbid	Included	171
Nablus	Excluded	--
Jerusalem	Excluded	--
Total		352

Source: Statistical Yearbook: Ministry of Education, 1966; and the follow-up mail questionnaire

Irbid secondary industrial school had its first graduates in the academic year 1962-63. Taking this fact into consideration, and to secure the homogeniety of the interviewees all the graduates of the Amman and Irbid schools of the academic years 1963/64, 1964/65, and 1965/66 were taken as subjects of the follow-up mail questionnaire survey (see Appendix 1 to this chapter).

The Follow-up Mail Questionnaire

The follow-up survey had two aims. The first was to determine the number of graduates for the three years who are in Jordan and the number of those who are outside Jordan. For the graduates abroad, it was important to know whether they were away for work or study purposes. In other words, the graduates were classified

into the following categories:

1. Graduates who are working abroad
2. Graduates who are studying abroad
3. Graduates who are in Jordan

The second purpose of the follow-up survey was to learn the whereabouts of the graduates who are in Jordan, especially the working place addresses of those who are employed.

The total number of graduates of the two schools for the three years is 352. A simple fact-finding questionnaire was sent to their home addresses taken from the records of the schools. Two hundred eighty responses were received by mail. Later, a person to person "snow-ball" technique was followed to determine the whereabouts of those who did not respond, until a total of 302 graduates was located. Thus the destiny of 50 graduates could not be determined. The main findings of the follow-up survey are classified into five main categories as shown in Table 1-2.

Table 1-2

Graduates According to Located Places

Categories of Graduates	No. of Graduates	%
Working abroad	33	9.4
Studying abroad	54	15.4
Employed in Jordan	194	55.1
Unemployed	21	7.5
Not located	50	12.6
Total	352	100.0

Source: Mail questionnaire survey of Amman and Irbid secondary schools graduates for 1963/64, 1964/65, 1965/66.

Located Graduates Employed in Jordan in Terms of Sectors

The 194 located graduates employed in Jordan were found to be employed in all three sectors of the economy, the public, the mixed, and the private. Of the 194 graduates 76% are employed in the public sector, 20% in the mixed sector, and 4% in the private sector. See Table 1-3.

Interview of Located Graduates Employed in Jordan in Accessible Establishments

The data supplied by the follow-up survey were useful in two respects. The number of graduates who were either working or studying abroad was determined. This helped give answers to questions raised in the introduction. But more importantly, the follow-up survey supplied the necessary data about the category of employed graduates in Jordan, who were to be interviewed. (See Appendix 2 to this chapter.)

Of course, it would have been ideal if the total number of the located employed graduates in Jordan had been interviewed. However, this was not possible. Some establishments in which graduates were located were closed to scientific research due to the political set-up resulting from the Middle East hostilities. Out of the 194 graduates employed in Jordan, 57 were located in such inaccessible establishments. In addition 6 graduates who indicated they were working in river-dam projects could not be interviewed because work was suspended in the post-war period.

Table 1-3

Located Graduates Employed in Jordan in Terms of Public, Mixed and Private Sectors

Category	Number	%
1. Public sector:		
Army workshops	44	
Ministry of Education	21	
Ministry of Communications	16	
Broadcasting station	12	
Railways	8	
Public works	8	
Aqaba sea-port	8	
Natural Resources department	6	
River dams projects	6	
Police force	5	
Meteorological Department	5	
Civil Aviation	4	
Central Bank	3	
Ministry of Finance	1	
Sub-total	147	76
2. Mixed sector:		
Refinery	20	
Electrical Power Stations	14	
Cement Factory	4	
Sub-total	38	20
3. Private sector:		
Iron and Steel Factory	3	
His own business (Plumbing workshop)	1	
Blacksmith workshop	1	
Textile Factory	1	
Aluminum Factory	1	
Bata Shoe-factory	1	
Deisel Engine Factory	1	
Sub-total	9	4
Grand total	194	100

Source: Mail questionnaire survey of Amman and Irbid secondary industrial schools graduates for 1963/64, 1964/65, 1965/66

So the number of graduates excluded from the total number of located graduates who are employed in Jordan is 63. This left the researcher with 131 graduates who should have been interviewed.

These 131 graduates were found to be employed in 20 establishments, 10 establishments in the public sector (84 graduates), 3 in the mixed sector (38 graduates) and 7 in the private sector (9 graduates), as indicated in Tables 1-4, 1-5, and 1-6.

Table 1-4

Graduates Employed in Accessible Establishments in the Public Sector

Establishments	No. of Graduates
Ministry of Education	21
Ministry of Communication	16
Broadcasting Station	12
Railways	8
Public Works	8
Natural Resources Department	6
Police Force	5
Civil Aviation	4
Central Bank	3
Ministry of Finance	1
Total	84

Source: Mail-Questionnaire survey of Amman and Irbid secondary industrial schools graduates for 1963/64, 1964/65, and 1965/66.

Table 1-5

Graduates Employed in Accessible Establishments in the Mixed Sector

Establishments	No. of Graduates
Refinery	20
Electricity Power Station	14
Cement Factory	4
Total	38

Source: Mail-Questionnaire Survey of Amman and Irbid Secondary industrial schools graduates for 1963/64, 1964/65, and 1965/66.

Table 1-6

Graduates Employed in Accessible Establishments in the Private Sector

Establishments	No. of Graduates
Iron and Steel Factory	3
Blacksmith workshop	1
Textile Factory	1
Aluminum Factory	1
Bata Shoe Factory	1
Deisel Engine Company	1
Own Business	1
Total	9

Source: Mail-Questionnaire survey of Amman and Irbid Secondary industrial schools graduates for 1963/64, 1964/65, and 1965/66.

The researcher tried to interview the total number of employed graduates in accessible establishments in Jordan. In some cases this was not possible because the graduates were on leave, sick, in a night shift, etc. Finally 90 (69% of the total number of graduates employed in accessible establishments in Jordan) were interviewed. (See Table 1-7.)

Interview Survey of Work-companions of Graduates

The survey of graduates revealed that there were ten major establishments employing 66 graduates in Jordan (see Table 1-8). For comparative purposes, two or three work-companions in each of the ten establishments were interviewed. The total number of interviewed work-companions is 22. The work-companions in each establishment were selected on the basis that they were doing almost the same tasks as the graduates. They represented the operation and maintenance departments of each of the establishments as well as the specialized tasks required in the technical departments and establishments.

Interview of Middle Level Workers in Establishments Not Employing Graduates

In order to get more data about the kind of in-employment training prevailing in the employment system of Jordan and for comparative purposes in the research, it was necessary to launch this fourth step in the field research. The main criterion for

Table 1-7

Graduates Interviewed in Each of the Accessible Establishments

Establishment	No. of Graduates Employed	No. of Graduates Interviewed	%
Ministry of Education	21	8	38
Refinery	20	15	75
Ministry of Communications	16	15	94
Electricity Power Station	14	6	43
Broadcasting Station	12	11	92
Railways	8	5	63
Public works	8	6	75
Natural Resources Department	6	2	33
Police force	5	3	60
Cement Factory	4	3	75
Civil Aviation Department	4	4	100
Iron and Steel Factory	3	3	100
Central Bank	3	2	67
Ministry of Finance	1	1	100
Blacksmith Workshop	1	1	100
Textile Factory	1	1	100
Aluminum Factory	1	1	100
Bata Shoe Factory	1	1	100
Deisel Engine Company	1	1	100
Own business (Plumbing workshop)	1	1	100
Total	131	90	69

Source: Mail questionnaire and interview survey of graduates.

Table 1-8

Interviewed Work-companions of Graduates in Major Establishments Employing Graduates

Establishment	No. of Graduates Interviewed	No. of Work-companions Interviewed
Ministry of Education	8	2
Ministry of Communication	15	2
Refinery	15	3
Electricity Power Station	6	2
Broadcasting Station	11	3
Railways	5	2
Public Works	6	2
Cement Factory	3	2
Civil Aviation Department	4	2
Iron and Steel Factory	3	2
Total	66	22

Source: Interview survey of employed graduates and work-companions.

selecting the establishments was that they should represent, as far as possible, the various industrial activities in Jordan. Opinions of people expert in the field were taken into consideration in the process of selection. The ten establishments selected for the purpose are included in Table 1-9. The number of interviewed workers depended primarily upon the cooperative spirit of the employers.

Table 1-9

Interviewed Skilled Workers in Establishments Not Employing Graduates

Establishment	No. of Graduates Interviewed
Phosphate Mining Company	8
Wet Batteries Factory	8
Dry Batteries Factory	6
Perfumes, ice-cream, biscuits plants	6
Tannery Factory	6
Pharmaceutical Factory	3
Cigarettes Factory	4
Cooperative Printing Press	6
Foundry	6
Blacksmith and mechanics workshop	6
Total	59

Interview of Administrative and Technical Personnel of the Establishments and the Study of Publications and Records

Concurrently with the interview of employed graduates, their work-companions, and skilled workers, the researcher interviewed in every visited establishment the following categories of persons:

1. Managers and administrators
2. Recruitment officers
3. Training officers

4. Top technical level personnel

5. Foremen

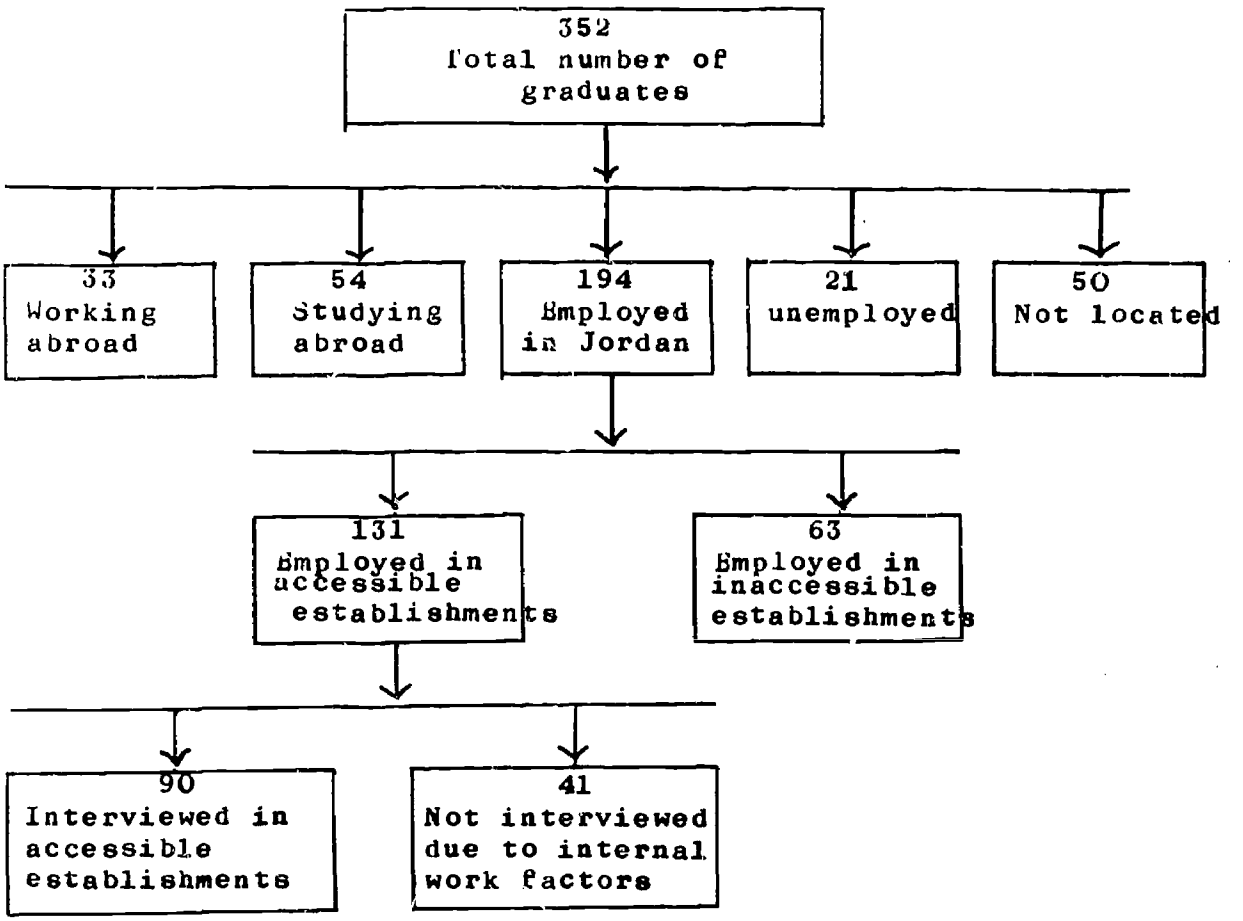
6. Work-supervisors

Structured questions were used in the interviews. Also, publications by the establishments were sought and records where accessible were studied.

Diagrammatic Representation of the Selection of the Interviewees Procedure

The diagram on the following page illustrates the procedure by which the total of 172 workers interviewed was arrived at.

Diagramatic Representation of the Selection Procedure



+

23
Interviewed work-companions of graduates

+

59
Workers in establishments not employing graduates

Summary

1-Interviewed graduates of secondary industrial schools.....90
2-Interviewed work-companions of the graduates.....23
3-Interviewed skilled workers in establishments not employing graduates.....59

Total 172

Appendix 1

THE FOLLOW-UP MAIL-QUESTIONNAIRE TO GRADUATES OF AMMAN AND IRBID SECONDARY INDUSTRIAL SCHOOLS FOR 1963/64, 1964/65, AND 1965/66

1 - Full name of the graduate:.....

2 - Address of the graduate:.....

.....

3 - The trade learnt at school:.....

.....

4 - Year of graduation:.....

5 - Address of employing establishment (in case currently employed)

.....

6 - Date of joining the current employing establishment:.....

.....

7 - Mention the successive names of the employing establishments you have worked with since graduation: with dates of entry and quitting:

(1) .....

.....

(2) .....

.....

(3) .....

.....

Note: Questionnaires were sent to guardian addresses as supplied by the schools. A covering letter contained an item to be filled by the guardian indicating whether the graduate is abroad, and if abroad, whether for employment or study purposes.

Appendix 2

INTERVIEW OF EMPLOYED GRADUATES

Name of interviewee:.....

His permanent address:.....

Name of secondary industrial school and year of graduation:

.....

Place of interview:.....

Date of interview:.....

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1 - Date of birth:.....

2 - Place of birth:.....

3 - Marital status: (1) Married (2) Married with children (3) Not married

4 - Is father living or deceased? (1) Living (2) Deceased

5 - Father's occupation:.....

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6 - Address of the employing establishments.....

7 - The trade learnt at school:.....

8 - Title of occupational position:.....

9 - Duties carried out by the graduate:.....

.....

10 - Salary: (1) Initial (2) Present

11 - Type of in-employment training the graduate had undergone:

.....

12 - Did the graduate work in establishments other than the present one, if yes, mention date of entry and quitting, reasons for quitting and earnings:

(1) .....

(2) .....

(3) .....

13 - When did he start working in the present establishment?.....

14 - How did he get the present work?.....

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15 - What part of the four school curriculum components were related to the present job, or were utilized in getting substitute components for the un-utilized components:

(1) General skills (2) Specific skills

(3) General theory (4) Specific theory

16 - Did he ever think of starting his own business?

17 - Did he sit or is planning to sit for the general secondary education certificate?

18 - Did he attempt to work abroad?

19 - What was his practical course in the preparatory school (Junior high)?

20 - What was his rank in the last preparatory grade, that is before joining the industrial school?

21 - Is he satisfied in his present work?

22 - General impressions of the worker about his school education and training and his work?.....

.....

23 - If the graduate is given the opportunity to be transferred from his present work to a clerical job as a government or a private enterprise employee, would he accept that offer,

(1) If earnings were higher? (2) Even if earnings were lower?

(3) Would he prefer to be in his present job whatever the other offers were?

Note: The same form but using the relevant items was used for the interview of work-companions and workers of establishments not employing graduates.

CHAPTER II

THE EDUCATIONAL SYSTEM

The educational system in any country is presumably established to meet the needs of individuals and society. The education provided to students, besides meeting their personal development needs, prepares them to perform certain occupational roles in society. These roles might be social, political, or economic. That part of education and of associated training which prepares students to perform their occupational roles is called occupational education and training.

Graduates perform occupational roles by occupying certain positions in society. When an individual holds a position to perform an occupational role, he is said to be employed in what is called the employment system. Professor Staley defines the employment system as "the sum total of occupational roles in a society."[1]

Three agencies offer pre-employment occupational education and training to students. The two major ones are the Ministry of Education and UNRWA. The third consists of various national and foreign private philanthropic agencies. Although the main concern of this study is the public occupational education and training

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[1]Eugene Staley, Planning Occupational Education and Training for Development (Stanford International Development Education Center (SIDEC), School of Education, Stanford University, 1967), pp. 2-5.

provided by the Ministry of Education, a brief survey of the activities of UNRWA and the private systems is necessary for the understanding of the over-all situation in Jordan.

Occupational Education and Training in the UNRWA System

UNRWA (United Nations Relief Works Agency for Palestinean Refugees) has its own educational system in Jordan which includes elementary and preparatory (junior high) schools and vocational training centers.[2] The schools and centers run by the Agency educate and train the children of the Palestinean refugees. Though the system is independent of the Ministry of Education, the schools must follow the general education curriculum applied in the schools of the Ministry of Education. Refugee students who are eligible for higher secondary education (senior high) are accepted in the schools of the Ministry of Education.[3]

UNRWA occupational training is provided in Jordan in three centers. Two of these are for boys, one near Jerusalem and the other near Amman, and the third, for girls, is located near Jerusalem. The Jerusalem boys center began functioning in December of 1953; the Amman boys center in October of 1960; and the

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[2]Beirut Regional Center for the Advanced Training of Educational Personnel in the Arab States, Fifth Presentation of Education in Palestine (Beirut: Regional Center, 1966), p. 18.

[3]Ibid., p. 18.

Jerusalem girls center in 1962.[4] Experts from the ILO (International Labor Organization) helped in the preliminary survey, the construction of curriculum, and in giving the initial technical take-off for the three centers.[5]

Characteristics of the System

UNRWA training consists of two programs. The first is at the post-secondary level, admitting applicants who pass the Public Secondary Education Examination. The second is at the secondary level, admitting students who finish either the elementary school or the junior high school. For both programs applicants have to sit for a competitive entrance examination held by the UNRWA educational authorities. The duration of the course of study is one or two years depending upon the nature of the trade learned. "A ratio of 75% practical to 25% academic training is maintained" in the UNRWA system.[6] The school year is eleven months, an arrangement which provides a more economical utilization of the expensive workshop equipment of the centers than the nine months school year arrangement followed by the public secondary industrial schools. These four main characteristics--the admission requirements, the duration of training, the ratio of practical to theoretical training and the length of the school year--should be

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[4]Ministry of Education--A.I.D./J., The Vocational Education Program in the Hashemite Kingdom of Jordan, 1962: a Survey Report (Amman: Ministry of Education, 1962), pp. 151, 127.

[5]Ibid., p. 151. [6]Ibid., p. 152.

remembered when examining the systems of occupational training in Jordan.

The curriculum of the boys centers contains a variety of activities. Table 2-1 illustrates the curriculum offerings. The firls' curriculum contains these fields of specialization: (1) tailoring and needle-work, (2) nursing and child care, (3) secretarial work, (4) beauty operator, (5) home economics.

UNRWA has a placement service at the central office that helps graduates find suitable employment. Follow-up studies indicate that approximately 50% of the UNRWA graduates generally find suitable jobs in Jordan and 30% in Saudi Arabia and Iraq, with the exception of the year 1961 in which 70% of the graduating class found employment in Kuwait.[7]

Training in the Private System

The private system of schools and centers is the product of philanthropy. There are eight major institutions. Six are located in the western bank, two in the eastern bank of Jordan. All with the exception of the Salesian Trade School and the Islamic Orphanage Industrial School came about in an effort to educate and train the children of Palestinean refugees.

The private system differs from the other two systems, the public and UNRWA, in its admission requirements and the level and

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[7] Ibid., p. 153.

Table 2-1

Trades and Specializations Offered in UNRWA Boys Centers

Trades	1	2	3	4	5
Building:	masonry	carpentry	plumbing	plastering[o]	upholstering[o]
Mechanical:	auto	forging	fitter mechanist	diesel plant site	welding[+]
Electrical:	electricians	RadioTV	wiremen & cable[+]	telecommunication[o]	
Professional:	drafting	land surveying[+]	quantity surveying	business & office trades	

Source: Vocational Education Survey in Jordan, Ministry of Education, AID, Amman, 1964.

+ = One year course; the rest are two-year courses.

o = Given only in Amman.

kind of training. Some of the centers accept students who finish elementary education, while others provide the elementary education before offering training in trades. The curriculum of the centers and schools is mainly devoted to the practical aspects of training. Children learn the traditional trades that suit small workshops or enable the trainee to start his own business with a small amount of capital.

Trades learned include blacksmithing, carpentry, weaving, shoemaking, book-binding, printing, laundry, bamboo work, upholstering, leather work, brush and broom making, and cabinet and furniture making. (See Table 2-2.) Trainees are given an apprenticeship training during which they help make products for sale in the market. In some cases training is accompanied by courses in Arabic, English, and arithmetic.

The Public Educational System

Student Population of the Elementary and Secondary Levels

The population of Jordan is 2,016,618. Of this total, 20.5% (413,823 persons) are students of the various educational institutions.[8] Table 2-3 shows that 92% of the first grade school age children and 68% of the sixth grade school age children are attending schools. At the secondary level, 62% of the seventh

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[8]Ministry of Education, Annual Report, 1965/66 (Amman: Ministry of Education, 1966), p. 25.

Table 2-2

Centers and Schools of the Private System

Institution	Year Founded	Place	No. of Trainees	Trades
Salisian Td. Sch.	1863	Bethlehem	*	Woodcarving, tailoring, baking, bookbinding, blacksmithing, electricity
Islamic Orph. Sch.	1922	Jerusalem	190	Cabinet-making, printing, binding, upholstering, bamboo works, shoe-making, brush
YMCA Tr. Center	1950	Jericho	100	Carpentry, blacksmithing, upholstering, bamboo & plastic, laundry, etc., painting
The Arab Development Soc. Voc. Center	1951	Jericho	80	Blacksmithing, machine-shop, welding shop, carpentry, weaving
The Jordan Orphanage	1951	Amman	50	Carpentry, leather-work
Christian Approach Center	1953	Bethlehem	23	Carpentry, shoe-making, tailoring, printing
Lutheran Voc. Center	1953	Jerusalem	20	Smithery, carpentry, shoe-making
Schneller School	1959	Amman	31	Black-smithing, carpentry, printing, shoe-making, farming, business office

Source: Vocational Education Survey in Jordan: Ministry of Education, AID, Amman, 1964.

*Not available

grade school age children are at school, while the percentage for the twelfth grade is 22%. Of the 9913 students who were in the twelfth grade for the year 1965/66, 5441 got their secondary diplomas.[9]

Table 2-3

Percentage of Students to Population by Age

Grade	1	2	3	4	5	6	7	8	9	10	11	12
Age	7	8	9	10	11	12	13	14	15	16	17	18
% of school age children	92	86	84	82	72	68	62	54	43	32	28	22

In terms of absolute numbers, there were 295,177 students at the elementary cycle (Table 2-4), 68,037 students at the preparatory cycle (Table 2-5), and 31,039 at the higher secondary cycle (Table 2-6). Of the 31,039 students in the higher secondary cycle, 352 were in the agricultural schools and 716 in the secondary industrial schools. In other words, 2% of the total enrolment in the higher secondary level attend the vocational schools while 98% are in the general schools.

[9] Ibid., p. 19.

Table 2-4

Enrolment of Students at the Elementary Level since 1955/56

Year/grade	1	2	3	4	5	6	Total
1955/56							
1956/57	39386	36841	37193	35419	28955	21146	198940
1957/58	42190	34284	34424	34899	35821	23501	205119
1958/59	44733	36704	32645	33169	38052	27533	212836
1959/60	42675	38243	34307	30822	36094	27851	210802
1960/61	42828	37837	36704	37414	30288	27417	212488
1961/62	48155	37398	36124	41478	31780	25053	219988
1962/63	54364	42955	36130	41640	35022	27314	237425
1963/64	55521	48907	41390	41753	36011	29850	253432
1964/65	61598	50617	47451	47238	37175	31156	275235
1965/66	64492	56741	50531	49844	40843	32736	295177
1966/67	68548	59628	55943	50947	46340	36178	318124
1967/68							

Source: Yearbook of Education: Ministry of Education, Jordan, 1965/66.

Table 2-5

Enrolment of Students at the Preparatory Level since 1955/56

Year/Grade	1	2	3	Total
1955/56				
1956/57	16488	11193	7533	35214
1957/58	17853	12737	8714	39304
1958/59	19344	13737	9653	42734
1959/60	17469	13856	9556	40875
1960/61	18392	14092	10674	43158
1961/62	18433	15000	11226	44659
1962/63	21054	15635	12518	49207
1963/64	24046	17453	13494	54993
1964/65	27570	20685	15072	63327
1965/66	28246	22785	17007	68037
1966/67	30047	23814	20170	74031
1967/68				

Source: Yearbook of Education: Ministry of Education, Jordan, 1965/66.

Table 2-6

Enrolment at the Secondary Level since 1955/56

Year/Grade	1	2	3	Total
1955/56				
1956/57	5497	3401	310	9208
1957/58	6503	4726	336	11565
1958/59	6999	5324	469	12792
1959/60	7286	5536	736	13558
1960/61	6857	6231	731	13819
1961/62	8234	5907	5709	19850
1962/63	9327	7296	6175	22798
1963/64	10966	8561	7635	27162
1964/65	11073	9716	8799	29588
1965/66	11343	9783	9913	31039
1966/67	11368	10934	10419	32721

Source: Yearbook of Education: Ministry of Education, Jordan, 1965/66.

The Educational Ladder

Children normally start the six years of elementary education at the age of seven. The elementary cycle is followed by three years of the preparatory cycle (junior high). The nine years of the elementary and the preparatory cycles constitute the compulsory years of education.[10] At the end of the preparatory cycle, all students sit for the Public Preparatory Examination. According to the Law of Education of 1964, education is terminal for those who do not pass the Examination.[11] Those who do pass are entitled to pursue their education in the three-year higher secondary cycle (senior high). The higher secondary education is bifurcated into the secondary general schools and the secondary vocational schools. The latter include both the agricultural and the industrial schools.

Aims of the Preparatory Cycle

Education in the preparatory cycle has three main functions. First, it continues some of the functions of the elementary school with respect to basic skills. Second, it provides courses in mathematics, natural science, languages, and social science as a foundation for study in the higher secondary cycle. Third it offers some practical industrial, agricultural, or commercial

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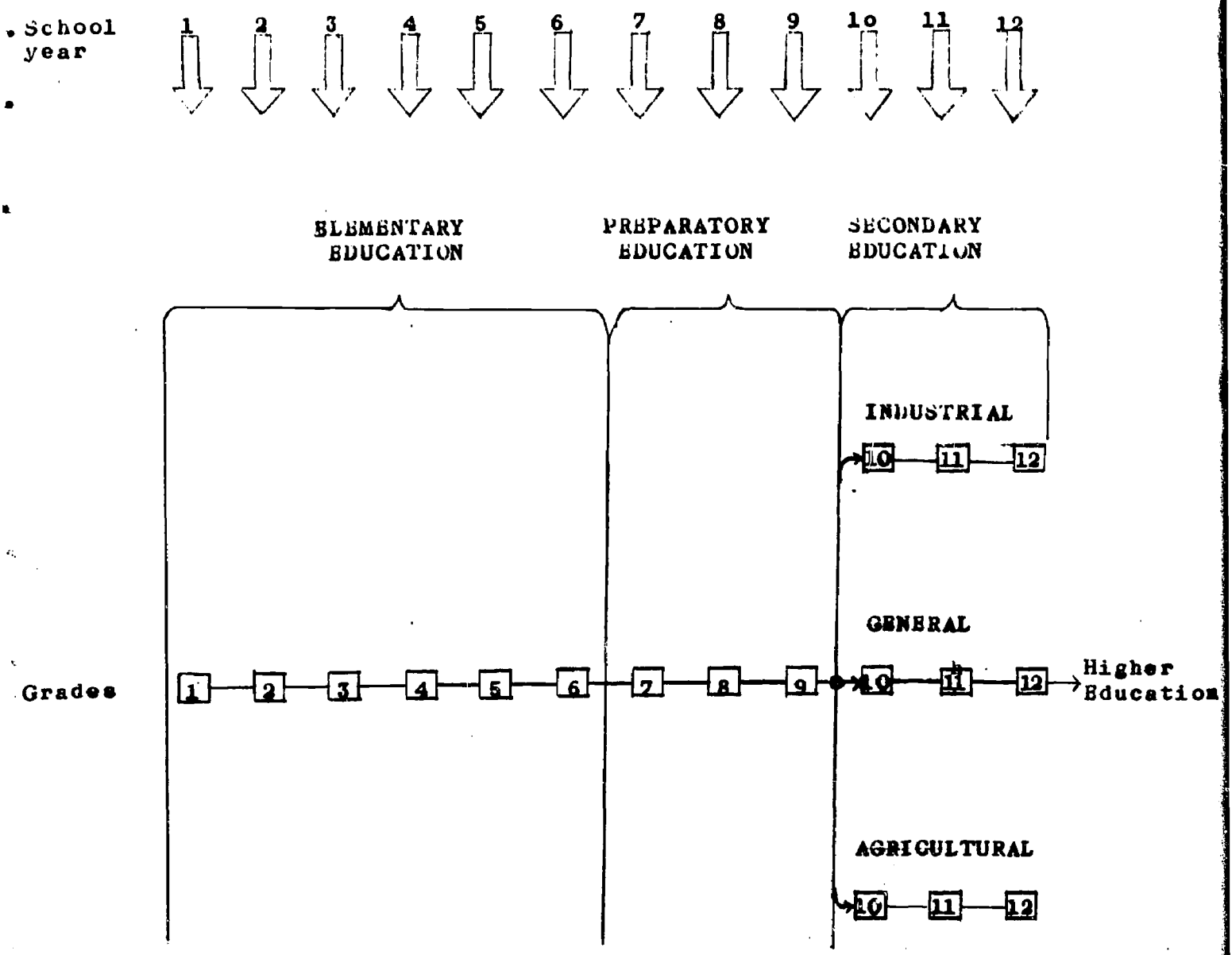
[10] Ministry of Education, Law of Education, 1964 (Amman: Ministry of Education, 1965), p. 19.

[11] Ibid., p. 22.

THE EDUCATIONAL LADDER IN JORDAN



courses as part of the general education for all students and as a necessary pre-occupational preparation for the terminal students.[12]

Aims of the Bifurcated System

The two types of secondary schools, the general and the vocational, have different aims. The major aim of the secondary general schools is to prepare students for higher education. The secondary vocational schools are supposed to prepare students for occupying middle-level manpower positions in the economy of Jordan. Thus, education of the general schools is not terminal, while that of the vocational schools is terminal. The secondary general school offers three streams or options: the literary, the scientific, and the commercial. Scientific and literary streaming starts at the beginning of the second year, commercial streaming at the beginning of the first. Accordingly, some students get a literarily biased curriculum; others get a scientifically biased curriculum; still others get a commercially biased curriculum.[13] See diagram of the educational ladder.

Vocational Aspects of the Curriculum of the Secondary General Schools

As a background for the analysis of the secondary industrial schools in Jordan, it is pertinent to look at the vocational aspects of the curriculum in the preparatory schools and the

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[12]Ministry of Education, Annual Report, p. 5.

[13]Ministry of Education, Law of Education, p. 21.

secondary general schools. It is unrealistic to argue that the secondary industrial schools are the only institutions within the educational system with a curriculum that provides occupational education and training. Although the curriculum of the secondary general schools is by definition a preparation for higher education, some of its contents are inherently related to occupational education and training.

Occupational Offerings in the Preparatory Schools

Officially, every boys preparatory school in Jordan contains as part of its general education curriculum one of the three practical courses: the industrial, commercial, or agricultural.[14] Every boy student is required to take for the three years of preparatory school the practical course offered in his school. Girls preparatory schools offer courses in home economics.

Generally speaking, preparatory schools in rural areas offer the agricultural practical courses, while preparatory schools in urban areas offer either the commercial or the industrial courses. In rare cases does a school combine the commercial and the industrial courses. Of the 49,522 students at the preparatory cycle, 22% (males) take the commercial courses, 11% (males) take the industrial courses, 38% (males) take the agricultural courses, and 29% (females) take the home economics courses. See Table 2-7.

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[14] Ministry of Education, Annual Report, p. 222.

Table 2-7

Preparatory Students in Practical Courses

Course	Males		Females		Total	
	No.	%	No.	%	No.	%
Commercial	11,380	22	--	--	11,380	22
Industrial	5,564	11	--	--	5,564	11
Agricultural	18,751	38	--	--	18,751	38
H. Economics	--	--	13,827	29	13,827	29
Total					49,622	100

Source: Ministry of Education: Annual Report, 1965/66.

Practical courses in the preparatory cycle have three stated aims. First, they inculcate in students respect for work. Second, they serve as an exploratory educational experience that helps students to decide at the end of the preparatory cycle which type of secondary school to enter, the general or the vocational. Third, they are considered a kind of pre-occupational education and training for the terminal students.[15]

In the 1965-66 graduating classes of the secondary industrial schools, 58% of the students came from preparatory schools located in rural areas. This is an indication that half of the clientele of the secondary industrial schools are probably from preparatory schools where no practical industrial courses are

[15] Ibid., p. 5.

offered. Moreover, only 20% of those who have had the industrial courses in the preparatory schools indicated that these courses influenced their decisions to enter the secondary industrial schools.[16]

This tenuous relationship between the industrial courses provided in the preparatory schools and the industrial schools in no way weakens their potentialities as an effective pre-occupational education and training for the terminal students and its value as part of the general education of the non-terminal students. In fact, the Higher Curriculum Committee is considering a suggestion to increase the weekly periods of the practical courses to not less than seven periods so that they might be an effective pre-occupational training for all students who would terminate their education at the end of the ninth grade.[17]

Occupational Offerings in the Secondary General Schools

It could be argued that most of the curriculum contents of the secondary general schools, especially mathematics, science, and language courses, have occupational values. Here, however, we are concerned with the offerings that are directly related to occupational preparation, particularly the commerce-biased curriculum given in the commercial sections. There are nine schools that

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[16]Interview of graduating students.

[17]Ministry of Education, Circular No. 3/114/13803.

have commercial sections. These are distributed in such a way that every major town in the country has a section in one of its secondary general schools. Students of commerce share with the students of other sections, the literary and scientific, most of the common educational courses, and have somewhat equal chances like other students to sit for the Public Secondary Examination.

In previous years the practical commercial courses in the preparatory schools were a prerequisite for the commercial sections, but they are no longer required. At present all the commercial sections are for boys. People interviewed by the researcher in the educational system as well as the employment system are of the opinion that such sections should be established in the girls' secondary schools. There is a trend in commercial establishments to employ women. Therefore, it is argued, girls in the secondary schools should have the opportunity to get commercial education.

The Ministry of Education established the first three commercial sections in Amman, Nablus, and Jerusalem in 1956/57. The number of enrolled students in that year was 111. Enrolment reached 758 in 1965/66. Table 2-8 illustrates the growth of the sections in ten years.

No follow-up study of the graduates of these sections has been conducted so far. But Ministry of Education officials are of the opinion that graduates of such sections have a better chance of employment in the commercial establishments of the country than their companions of the other sections.[18]

[18]Ministry of Education, Annual Report, p. 232.

Table 2-8

The Growth of Commercial Sections in the Secondary General Schools

Year	No. of Sections	No. of Students
1956/57	3	111
1957/58	4	157
1958/59	5	182
1959/60	6	199
1960/61	6	200
1961/62	6	367
1962/63	6	347
1963/64	6	383
1964/65	6	364
1965/66	9	758

Source: Ministry of Education, Annual Report, 1966.

CHAPTER III

THE SECONDARY INDUSTRIAL SCHOOLS

The Issues of Functions and Costs

Industrial Schools for What?

The functions and aims of the secondary industrial schools have lately been an issue in the educational circles of Jordan. The level of skill that a student should reach at the end of his three years of study is generally agreed upon. It "is to produce a well trained student possessing at least a minimum of hand skills and the related knowledge required for his trade and having proper work attitudes and good character."[1] In other words, the school is to prepare middle-level skilled manpower.[2]

A problem arises when we ask "training to meet the development needs of what?" Is it the development needs of Jordan or of Jordan and the oil-producing Arab countries? At the present time, a number of the graduates of the secondary industrial schools leave the country to work abroad. Data about the exodus of graduates vary. According to the Ministry of Education Annual Report of 1965, 26% of the graduates were working abroad. Another estimate

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[1]Ministry of Education--A.I.D., The Vocational Education Program in the Hashemite Kingdom of Jordan, 1962: a Survey Report (Amman: Ministry of Education, 1962), p. 3.

[2]Samih Abu al-Hassan, A Report on the Irbid Industrial School (Draft manuscript, 1967), p. 2.

gives a percentage of 40% for the graduates of Nablus school as working abroad.[3] The follow-up survey of graduates conducted by this researcher revealed that 9.2% of the graduates of 1964, 1965, and 1966 of Amman and Irbid Schools are working abroad (Table 1-2). Whatever the percentage, the fact remains that there are some graduates seeking employment abroad.

Highly official sources would limit the function to the labor market of Jordan.[4] Others feel that the schools should meet the middle-level manpower requirements of the other Arab countries as well as Jordan. The latter group calls for "the study of manpower requirements of neighboring Arab countries when planning to build more of the secondary industrial schools."[5]

The issue of whether to prepare skilled workers for Jordan alone or Jordan and other countries has practical policy implications. Those who hold that schools are to meet the development needs of Jordan only, recommend that no more secondary industrial schools be built. They say that the existing schools not only meet the present needs but, more importantly, generate a surplus, part of which is exported.[6] Those who contend that the schools should

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[3]Mundhir al-Masri, ex-principal of Nablus Industrial School, personal file.

[4]Ministry of Education, Higher Curriculum Committee Working Papers on Secondary Education, 1967.

[5]Attributed to Burhan Kamal in the Higher Curriculum Committee Papers on Secondary Education, 1967.

[6]Ministry of Education--A.I.D./J, op. cit., p. 26.

meet the needs of other countries as well as Jordan want more such schools built.

The position taken by this researcher differs from both these positions. The issue, as he sees it, is not whether to have more or fewer industrial schools but whether it is true that all the middle-level manpower requirements of the Jordanian employment system have, in fact, been met. If they have not, then we should ask whether the secondary industrial school is the only arrangement that can meet these needs.

The Function of Solving the Unemployment Problem

Some people think of the industrial schools as a means of solving the problem of unemployment among the secondary general school graduates. The fact that some graduates of industrial schools seek employment abroad can lead to the conclusion that increasing the number of such schools would not solve the problem of unemployment among the secondary general schools graduates.[7] However, it is possible that the industrial schools might increase employment opportunities for the graduates provided such opportunities are available in the market and that the private sector reacts favorably towards such graduates.

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[7]Ministry of Education, Jordan, Circular No. 3/114/13803; Ministry of Education--A.I.D./J., op. cit., p. 26.

Cost Considerations

The existing four secondary industrial schools began as a joint venture of the Government of Jordan and the United States or the West German Governments.[8] That is, the industrial schools came into existence as a result of foreign aid. Currently there is some thinking and discussion of the cost aspects of building more industrial schools. Realizing that building such schools may necessitate the allocation of more funds to the budget of the Ministry of Education than are normally allocated, the Higher Curriculum Committee raised the following question with the Jordanian Council of Ministers. "If the Government intends to increase the number of secondary industrial schools, then to what extent is the Government willing to meet the costs of these schools, knowing that the cost of building and equipping one such school is about 300,000 JDs?"[9] Masri, on the other hand, argues that if "we want to absorb half the number of students finishing the preparatory cycle in newly built vocational schools, then we will be in need of at least fifty such schools. The cost of construction and equipment would be fifty million JDs. and the annual running cost 750,000 JDs."[10] Although his estimates are probably too high, they do reflect the financial magnitude of the problem.

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[8] Ibid., pp. 91, 110.

[9] Ministry of Education, Jordan, Circular No. 3/114/13803.

[10] Mudhir al-Masri, Personal File.

Related Research Studies

Two studies were conducted in recent years on the secondary industrial schools and other training institutions in Jordan. The first dealt with quantitative aspects of the problem.[11] The study does not question the basic functions of the schools but raises the question of whether there is an oversupply of graduates or not. The second study dealt with qualitative aspects of vocational training.[12] It raised the question of whether employed graduates are, in the opinion of their employers, better than their work-companions who acquired their skills in the employment system.

The quantitative study assumed that 25% of the industrial labor force usually needs to be "formally trained in a vocational trade training program of the government educational system."[13] The second assumption made is that there would be an annual employment increase of 7.5% in the labor force between 1960 and 1967. Thus, if the total number of industrial and building construction workers was 32,000 in 1960, the number would be 61,750 in 1967. The annual increase in labor force is 3000 workers, and the annual need for already trained workers is 750 (25% of 3000).

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[11] Ministry of Education--A.I.D., op. cit.

[12] Jordan Development Board, Manpower Study, 1963 (Amman, 1965).

[13] Ministry of Education--A.I.D./J., op. cit., p. 25.

It was estimated that the industrial training centers and schools annually produce 879 trained workers. Taking supply and demand into consideration, there is an excess of supply over demand of 13%. On the basis of this finding, the study recommended that no more secondary industrial schools be built.

The qualitative study was conducted by the Jordan Development Board as part of a manpower study survey in Jordan. Only 72 employed workers who were formally trained in some type of vocational institution, including the secondary industrial schools, were found to be employed in privately owned industrial establishments that employ five or more employees.[14]

Employers were asked to judge the work of the graduates as compared with that of work-companions who never went to a vocational institution. The work-companions were of three kinds: (a) newly employed, (b) with one to two years of experience, and (c) with three to four years of experience.[15] The following results were obtained:

1. Graduates compared with work-companions with no experience: (a)10 were less efficient; (b) 9 were equally efficient; (c) 53 were more efficient. That is, 74% of the graduates were judged to be better than their work-companions with no experience.

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[14]Jordan Development Board, op. cit., p. 56.

[15]Ibid., p. 53.

2. Graduates compared with work-companions with one to two years experience: (a) 25 were less efficient; (b) 20 were equally efficient; (c) 27 were more efficient. That is, 38% of the graduates were judged to be better than work-companions with one to two years experience.

3. Graduates compared with work-companions with three to four years of experience: (a) 38 were less efficient; (b) 22 were equally efficient; (c) 12 were more efficient. That is, only 17% of the graduates were judged to be better than their work-companions of three to four years of experience.

The Manpower Study arrives at two conclusions: (1) The attitudes of employers towards graduates of industrial training institutions is not encouraging. These graduates, after a few years on the job, are not judged better than their work-companions who got their training in the employment system. (2) Accordingly, the basic philosophy of vocational programs in Jordan is in urgent need of being reconsidered and revised.[16]

The fact that there were 16,773 skilled workers employed in the private industrial sector of Jordan and that only 72 of these were found to have received training in some type of vocational institution indicates, in the opinion of this researcher, that the role of the employment system in the field of occupational training for the private sector was a decisive one and that the contribution of the vocational training institutions was negligible.

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[16] Ibid., p. 57.

Enrolment, Location, and Curriculum of the Schools

According to the official philosophy of education, Jordan has two types of secondary schools, the general and the vocational. The latter include the industrial schools.[17] On the basis of enrolment, however, the general is more significant than the vocational. The general schools account for 98% of the students; the enrolment in the industrial secondary schools 2%.

Until 1960 Jordan had only one secondary industrial school, located in Amman. Since 1960 three other schools have been established in Irbid, Nablus, and Jerusalem. The geographical concentration of industrial establishments was not a criterion for building these new industrial schools. Local political pressures account for the locations. Locating the schools near to students' homes in the various districts of Jordan was a major consideration. Consequently, some of the schools were built in areas that are predominantly agricultural, such as Irbid and Nablus. See Table 3-1. These agricultural areas do, however, have workshop-type establishments which offer summer training opportunities for the students.

The Ministry of Education usually asks a committee of teachers to construct the curriculum. The curriculum, interviewed teachers stated, reflects what the teachers know and, more importantly,

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[17]Ministry of Education, Law of Education of 1964 (Amman, Ministry of Education, 1965), p. 21.

what the teachers can teach. No field study has yet been conducted to assess the real needs of the employment system or the nature of the skills and knowledge required by the employing establishments in order to incorporate them into the curriculum.

Table 3-1

Percentage Distribution of Establishments (More Than 10 Employees) and Employed Persons by Districts in Jordan

District	% of Establishments with More Than 10 Employees	% of Employees
Amman	42	63
Jerusalem	26	18
Nablus	23	11.3
Irbid	5	3.5
Hebron	4	1
Karak		.6
Maan		.5
Balqa		2.5
Total	100	100

Source: On establishments, The Industrial Study, p. 33; on employees, Manpower Study, p. 19.

The curriculum of the secondary industrial school differs from that of the general school. It is divided into two main parts, the theoretical and the practical.[18] The theoretical is

[18]The curriculum components of the industrial school are described and analyzed in Chapter V.

divided into two components. The first is the general theory component, which includes Arabic, English, German (in Irbid School), mathematics, physics, and religion. The second, the specific theory component, includes technology, technical drawing, applied mathematics, and shop management. The practical part is composed of the specific and the general skills components provided in the workshop activities in the various trades offered in a school. The ratio of theoretical to practical components differs from school to school. In the German-oriented Irbid school, theory gets 25% while practice gets 75% of the total allotted time. In the Amman school, practice and theory are almost equal. See Table 3-2.

All students spend the first year in general vocational orientation. After that each student is assigned to one trade. The trades taught are: cold metals, hot metals, auto mechanics, plumbing and air-conditioning, carpentry, electrical work, and the building trades.

Staffing the secondary industrial schools with qualified teachers has been a problem. Present and ex-principals of Irbid, Amman, and Nablus industrial schools are of the opinion that the best teachers usually leave the country, attracted by better salaries abroad. The majority of teachers are graduates of the schools themselves (see Table 3-3). Many of the teachers have had some further training either in Germany or the U. S. A. The few university graduates, three in Amman and two in Irbid, teach the general theoretical courses.

Table 3-2

Weekly Schedule of Amman and Irbid Schools

Category	1 year		2 year		3 year	
	Amman	Irbid	Amman	Irbid	Amman	Irbid
Mathematics	4	2	4	-	2	-
Applied mathematics	2	1	-	2	2	2
English	3	1	3	1	5	1
Arabic	2	1	2	2	-	1
German	-	1	-	1	-	1
Religion	1	1	1	1	1	1
Technical Drawing	3	4	3	4	4	4
Technology	2	2	3	2	1	2
Workshop Management	-	-	-	-	2	1
Physics	2	2	3	2	2	2
Workshop	24	31	21	36	24	35

Source: School documents.

Table 3-3

Teachers According to Qualifications

Category	Amman	Jerusalem	Irbid	Nablus
Secondary or below	--	--	1	1
Teacher colleges	--	--	2	2
Higher ed. below univ.	1	2	--	--
University	3	2	3	5
Secondary industrial	12	6	11	13
Total	16	10	16	21

Source: Ministry of Education Annual Report, 1965/66, p. 227.

Social and Academic Background of Students and Their Aspirations

A questionnaire was administered to all 84 final year students of the two schools of Amman and Irbid. The purpose was to get data on the students' social and academic backgrounds and their vocational aspirations.

Social and Academic Background

One might expect many of the students entering the industrial schools to be from urban areas, where industrial practical courses are provided in the preparatory schools. This is not the

case. It was found that 58% of the students covered by the questionnaire are of rural origin and 42% of urban origin. The researcher considered residential areas that are outside the major towns of Jordan as rural.

The students were asked to state the social class of their families. Thirty percent perceive their families as being lower class, 70% as being lower middle class, and none as in the middle class.

As for the fathers' education, the questionnaire results show that 28.5% of the fathers are illiterates and 64.5% have some elementary education. Only 7% of the fathers have an education higher than the elementary level.

The fathers' occupations are shown in Table 3-4. Farming ranked first, 41.6%, while running small businesses and being daily workers ranked second, 8.3% for each.

The academic background of these students presents a contrast to the students in other countries usually recruited to industrial schools. It is a general policy of the Ministry of Education to accept for the industrial schools the best or the better students from among those who passed the Public Preparatory Examination held at the end of the ninth grade. Normally the number of applicants, most of whom are of poor family background, exceeds the number of first year vacancies at the schools by a ratio of four to one, according to one school principal. A special committee of the Ministry of Education tours all the districts of the country to interview the applicants and select the best and most promising.

Table 3-4

Fathers' Occupation

Category	No.	%
Unemployed	5	6
Mason	1	1.3
Carpenter	1	1.3
Merchant	7	8.3
Car-driver	1	1.3
Village chief	1	1.3
Secondary Teacher	1	1.3
Civil servant	3	3.5
Upholsterer	1	1.3
Farmer	35	41.6
Daily Worker	7	8.3
Cook	2	2.4
Baker	1	1.3
Sweets maker	1	1.3
Tile maker	1	1.3
Grocer	1	1.3
Soldier	4	4.7
Dead	11	13.2
Total	84	100

Source: Questionnaire to graduating students.

The principal of Irbid school states that "the rank of the student in his preparatory school is taken into consideration before he is accepted in the industrial school."[19] In the interview of 90 employed graduates conducted by the researcher, 53.3% reported that they ranked first to fifth in their previous schools, 33.3% sixth to tenth and 31.4% eleventh to fifteenth. The researcher checked school records concerning the students who

[19]Samih, op. cit., p. 15.

stated that they ranked in the first five in the ninth grade, and findings support the graduates' statements.

Why Do Students Join the Secondary Industrial School?

The researcher wanted to investigate the type of counseling and guidance that students get before joining the industrial schools. No system of formal counseling is available in the educational system. Answers to a question concerning counseling and guidance were coded into various categories (Table 3-5). The category that ranked highest is the self-guided category, which accounted for 35.7% of the answers. The role of the industrial practical courses was confirmed by 14.3%, while the roles of the school (teachers and principals) and the community (relatives and friends) were almost equal, 19.1% and 20.2% respectively.

Table 3-5
Guidance of Students

Category	No.	%
Self	30	35.7
Principal	8	9.5
Teacher	8	9.5
Relatives	10	11.9
Friends	7	8.3
Industrial practical courses	12	14.3
None	9	10.7
Total	84	100.0

Source: Questionnaire to graduating students.

The researcher is of the opinion that, regardless of the source of information and guidance, in the society of Jordan, the father is most likely to be the final decision maker for his sons. To test this hypothesis, students were asked whether their fathers participated in the decision making. Table 3-6 shows the results. It should be noted that 11 of the 16 fathers in the third category are dead.

Table 3-6

Participation of Fathers in Decision Making

Category	No.	%
Highly participated	46	54.7
Participated to a certain degree	22	25.9
Did not participate	16	19.4
Total	84	100.0

Source: Questionnaire to graduating students.

It appears that the father, generally a poor man with little education, is the principal decision maker for his son. Poor fathers, under pressure to increase family income, choose the industrial school for their sons in the belief, probably, that the school offers better employment opportunities. It is possible that if students are given free choice, they might not choose the secondary industrial schools but some other educational avenue.

Students' Aspirations

The main objective here was to determine whether students have future plans that do not conform to the functions of the school. A key item in the questionnaire to final year students was designed to probe this possibility. The students were asked whether they were planning now or in the near future to sit for the Public Secondary Education Examination given at the end of the senior high secondary general education. A positive answer could mean that the student hopes to continue education, an aim which does not coincide with the terminal nature of the education provided by the secondary industrial school. In fact, all those who said that they were planning to sit for the Examination explained their plan by the intention to continue education. It was found that 72% of the students plan to sit for the examination and 28% plan to terminate their education.[20]

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[20]Apparently the aspirations represented by these figures have been recognized by officials. In 1968, the Ministry of Education announced that students of the secondary industrial schools will sit for a public examination similar to that given to students of the secondary general schools. The examination will be called the Secondary Vocational Education Examination. Those who pass the new examination will be entitled to pursue higher education. The Ministry of Education is trying, with this step, to give prestige to vocational education. (Interview with Head of Curriculum Division, Dr. Ishaq Farhan.) The fact that students who pass the Public Secondary Education Examination for which the secondary general schools presently prepare have the right to enter all the technical institutes and universities raises the question of whether it is more advisable to transfer all the college-oriented students to general secondary schools or to reorganize the industrial schools with a curriculum that recognizes that some of its clientele are college bound. All of the research and most of the writing of the present study had been completed before this announcement.

Earlier occupational aspirations should also be taken into consideration. Students were asked to choose one of eight occupations to which they had aspired before joining the industrial school. Of the 84 students, 80% of them had aspired to occupations that need higher education, while 19.1% had aspired to occupations that do not need higher education (Table 3-7). Of this 19.1%, only 5.9% aspired to be skilled workers.

Table 3-7

Earlier Occupational Aspirations

Category	No.	%
Teacher	4	4.7
Lawyer	--	--
Engineer	39	46.5
Army officer	19	22.7
Doctor	3	3.5
Company manager	3	3.5
Own business	11	13.2
Skilled worker	5	5.9
Total	84	100.0

Source: Questionnaire to graduating students.

Given the above findings on early aspirations and present examination plans, one may observe that the curriculum of the school, which is vocational and terminal, did not change the aspirations of many students. This is in accordance with the

finding of Foster that there is little causal relationship between curriculum content and vocational aspirations of students.[21]

The data of the questionnaire revealed that almost all of the students are planning to work immediately after graduation, and preferably outside Jordan. These findings of immediate employment and continuing education may at first seem contradictory but actually are not. Those who stated that they wish to continue education said that they consider employment only a transitional step towards higher education. The transitional employment is a period for saving money that will be needed to pursue education.

Students were asked whether they would prefer the period of study in the school to be longer or shorter than it is now. Of the 84 students, 61.8% of them want the period to be longer, and 34.6% want the period to be as it is. This expressed choice raises an interesting question. Would the addition of one or two years to the period of study be considered by the students a form of higher education? No conclusive answer could be given.

The Schools and the Employment System

The secondary industrial schools have three types of contacts with the employment system. The first is the arrangement of field trips for the students to well known industrial establishments. The second is the summer training program in the employment system.

[21]Philip J. Foster, Education and Social Change in Ghana (Chicago: University of Chicago Press, 1965), p. 260.

The third is that the schools act as evening training centers for workers in the employment system of Jordan.

Field Trips to Industrial Establishments

Students are taken in the company of a teacher to visit one or two establishments. The purpose of the visits is to give the students their first contact with an industrial establishment. Table 3-8 shows the industrial establishments visited. The visited places may be those establishments school officials believe to be the potential employers of the visiting students. The follow-up survey revealed, however, that graduates are employed in only seven of the nineteen visited establishments.

It is interesting to note that all the visited establishments are located in Amman district with the exception of the vegetable oil and traditional soap factories that are located in Nablus. Thus Irbid school students go out of their district to visit industrial establishments, while the Amman students do not. The Irbid district is completely agricultural except for the workshops.

When asked for their opinions about the visits, 65% of the students stated that the visits were useful, and the remaining 35% stated that they were useful to a certain degree. None said they were not useful.

Table 3-8

Visited Industrial Establishments

Establishment	Its Location	Visited by Amman Students	Visited by Irbid Students
Phosphate mining company	Amman	+	+
Refinery	Amman	+	+
Soap factory	Nablus	+	
Wet batteries	Amman	+	+
Power Stations	Mixed	+	+
Oil factory	Nablus	+	+
Sponge factory	Amman	+	
Army workshops	Amman	+	
Industrial company	Amman	+	
Paper factory	Amman	+	
Cement factory	Amman	+	+
Foundry	Amman	+	
Shoe factory	Amman	+	
Tannery	Amman		+
Chocolate factory	Amman		+
Cigarette factory	Amman		+
Railways	Amman		+
Broadcasting Station	Amman		+
Textile Factory	Amman		+

Source: Questionnaire to graduating students.

Summer Training in the Employment System

Summer training of the students is an important aspect of the industrial schools (see Table 3-9). Training is for two months. Since they generally have to bear most of the expenses, students look for establishments that are near their residences. A look at these establishments reveals an interesting situation. Most of the students get their summer training in small workshops. This is to be expected for the Irbid students, since their district is agricultural. But it is also so, with the exception of the refinery, the army workshop, and the power stations, for the Amman students. This is particularly striking when one considers the fact that 42% (Table 3-1) of the country's industrial establishments (ten or more employees) are located in the Amman area.

Table 3-9

Summer Training Establishments

Category	No.	%
Blacksmith W. S.	12	14.3
Fitters W. S.	8	9.5
Car Repair W. S.	18	21.5
Welding W. S.	4	4.7
R. Electric W. S.	5	5.9
Plumbing W. S.	3	3.6
Carpenter W. S.	4	4.7
Power station	14	16.4
Refinery	7	8.3
Army Workshops	2	2.4
Did not work	7	8.3
Total	84	100.0

Source: Questionnaire to graduating students.

To summarize: Students are accepted by factories of the private sector as visitors but not as potential employees. Students are accepted by workshops as trainees in the summer experience program, but graduates do not seek employment in these workshops because the wages are too low. After graduation, students are left with one major employer in the public sector, the government, and three major establishments of the mixed sector, the refinery, the power stations, and the cement factory.

The Schools as Training Centers for Employed Workers

The survey of vocational education in Jordan states that "the vocational trade-technical schools represent the most expensive unit of the country's educational system. Therefore, the full utilization of these plants would represent a true budgetary saving."[22] The survey recommended an increase in the present enrolment of these schools and, as a further step in utilizing the existing training institutions, the establishment of an evening program in the industrial schools.[23] One of the aims of such a program would be to provide "an opportunity for upgrading the vocational skills of presently employed tradesmen."[24]

In the same year that the survey was published, the first evening training program for already-employed workers was started

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[22]Ministry of Education--A.I.D., op. cit., p. 23.

[23]Ibid., p. 34.

[24]Ibid., p. 35.

in the Amman secondary industrial school. The program was initiated and financed by AID in Jordan. It is now organized by the Jordan Training Committee. The members of this committee are a group of persons representing some major employing establishments and individuals interested in vocational training and education.

The program is financed by donations from private establishments, the Ministry of Social Affairs, and fees paid by the workers. The Ministry of Education provides the secondary industrial school workshops and classrooms as training centers.

The training is held in the evenings for seven months every year. Trainees attend the program for three two-hour periods per week. Students get theoretical and practical training. One third of the program is allotted for the theoretical part, technical drawing, technology and applied mathematics, and two thirds for the practical part in the workshops. The teaching staff of the program are the teachers of the secondary industrial schools.

The admission requirements are flexible. Applicants should have been working in their trades for at least two years. They should know how to read and write. Young applicants have priority.

The current year, 1967/68, is the seventh year of operation for the evening training program in the secondary industrial school of Amman. Irbid and Nablus schools started the evening program in 1966/67. Table 3-10 shows the number of workers who have received upgrading training in the three schools. The cost of training is shown in Table 3-11. Each worker is required to pay a training fee of 3.5 JDs.

Table 3-10

Enrolment in Evening Training Programs

Training program	Amman	Irbid	Nablus	Total
Electricity	16	6	21	48
Carpentry	3	--	6	9
Plumbing	4	--	12	16
Auto mechanics	12	4	11	27
Hot metal	8	13	15	36
Cold metal	10	--	10	20
Building	--	--	7	7
Total	53	23	82	158

Source: Records of the Jordan Training Committee

Table 3-11

Annual Cost of Evening Training Programs

Category	No. of Trainees	Cost in JDs
Amman	53	645
Irbid	23	401
Nablus	82	607
Total	158	1653

Source: Records of the Jordan Training Committee

It has been indicated that practically all of the skilled manpower in the private industrial sector of Jordan is the product of the in-employment training activities of the employment system. It is generally in need of upgrading. The program, which provides the workers with the necessary technical theoretical foundation for what they know of the practical aspects of their trades, does in fact upgrade the participating trainees.

However, the program does have problems. The ex-principal of Nablus school states that the most important problem is the uneven educational backgrounds of the trainees (his personal file). Some of them have full elementary education; others can just read and write. Hence, instruction is hampered and much of the time is spent in the teaching of elementary principles of mathematics. Another problem is the increasing number of drop-outs. Last year 94 workers applied to Irbid school; 64 were admitted; and 23 finished the course.[25]

One interesting point about the whole program is that more than 90% of the participants are from small workshops, particularly in Nablus and Irbid. In Irbid 20 out of 23 workers who finished the course were workers in small workshops.[26] The researcher was told by the treasurer of the Training Committee that the course of training and the certificate which the trainee gets help the worker to get employment outside of Jordan.

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[25]Samih, op. cit., p. 10.

[26]Ibid., p. 11.

Appendix 1

Questionnaire to Graduating Senior Students

of the Secondary Industrial Schools

1 - Place of birth:.....

2 - Place of residence:.....

3 - Where did you get your preparatory education?

4 - Explain briefly the kind of counseling and guidance you got that helped in the process of decision in making to join the secondary industrial school.....

.....

.....

5 - What is the occupation of your father?.....

6 - My father

(1) Did not go to school

(2) Got some elementary education

(3) Got some secondary education

7 - To what extent did your father participate in the decision making process to join the industrial school?

(1) Participated to a great extent

(2) His participation was average

(3) Did not participate

8 - To which of the following social classes does your family belong, as you perceive it?

(1) Poor class

(2) Middle class

(3) Upper middle class

9 - I aspired to be one of the following:

(1) Teacher (5) Army officer

(2) Lawyer (6) Doctor

(3) Engineer (7) Company manager

(4) Business man (8) Skilled worker

10 - The period of study in the industrial school should be:

(1) Shorter than what it is

(2) As it is

(3) Longer than what it is

11 - Are you going to sit for the Public Secondary General Education?

(1) Yes (2) No

12 - Mention the names of industrial establishments that you have visited:.....

.....

.....

13 - Mention the name of the industrial establishment in which you had your summer training:.....

.....

14 - I prefer to work after graduation in

(1) Jordan (2) Outside of Jordan

Explain why.....

.....

CHAPTER IV

GRADUATES IN THE MARKET

The students who finish their formal education and training in the secondary industrial schools are the graduates referred to in this chapter. The analysis that follows focuses on what happens to the graduates in the market. What happens to them in the industrial establishments is discussed in Chapter V.

The researcher assumed that students seek four distinct destinations after graduation. In the introductory chapter four questions were posed:

1. What happens to graduates who seek employment in Jordan?
2. Are there graduates who seek higher education abroad?
3. Are there graduates who seek employment abroad?
4. Are there graduates who seek clerical jobs in Jordan?

These questions are analyzed on the basis of data from the follow-up mail questionnaire survey and the interview survey of 90 employed graduates in accessible establishments in Jordan.

Initial Unemployment and Change of Place of Work

Initial Unemployment

Initial unemployment is the period of involuntary unemployment that the graduate experiences after graduation until he finds his first job. Table 4-1 indicates that 76.7% of the total number

of interviewed employed graduates experienced a period of initial involuntary unemployment that ranged from one to twelve months, while 23.3% of the interviewed graduates found immediate employment.

Table 4-1

Initial Unemployment Experienced by 90 Interviewed Graduates of 1964, 1965, 1967

Period of Initial Unemployment (in months)	No.	%	
0	21	23.3	
1- 2	23	25.5	
3- 5	35	38.9	76.7%
6-12	11	12.3	
Total	90	100.0	

Source: Interview survey of 90 employed graduates.

The number of graduates immediately employed may represent what each employing establishment needs for the next several years and not a recurring recruitment policy on the part of these establishments. Recruitment officers and supervising engineers of the Ministry of Communications, the railways, the refinery, the iron and steel factory and the electricity power stations, all of whom are major employers of graduates of secondary industrial schools, pointed to the fact that any new industrial school recruit appointed

in the future would be a replacement and not an addition to the current labor force of the establishments. Therefore, unless new avenues of employment are made available in the mixed and public sectors, or unless the private sector begins to hire substantial numbers of industrial school graduates, immediate employment opportunities for future graduates will decrease.

Of the total number of interviewed graduates, 25.5% experienced initial unemployment for a period of one to two months. This period may be considered as a period of application for employment. On the other hand, 51.2% of the total number of interviewed graduates experienced a period of involuntary unemployment that ranged from three to twelve months. The researcher is inclined to include in this category some of the 20 graduates found unemployed. Some are in the period of initial involuntary unemployment.

Changing Place of Work

Finding a job after an initial period of unemployment is usually followed by the process of changing the place of work. According to the interview survey, graduates moved from one job to another, and for some of them the change was to more than two jobs. The current working place might be the first, the second, the third, or the fourth within the period of three years covered by the research.

Table 4-2 shows the changes in place of employment made by the interviewed graduates. For those who changed their place of

work more than once, there might have been a period of unemployment between one job and another. However, because we do not have data on this period, the number of months spent in each job could not be determined.

Table 4-2

Number of Interviewed Graduates Who Are Currently in Their First, Second, Third or Fourth Working Place

Category	No.	%
First working place	37	41.10
Second working place	37	41.10
Third working place	14	15.55
Fourth working place	2	2.25
Total	90	100.00

Source: Interview survey of 90 employed graduates.

The change of place of work takes place from the private to the public and mixed sectors, and within each of the three sectors. Reasons given by the interviewees for quitting a job differ depending upon personal ambitions and conditions of work. For all of those who changed the place of work, the first establishment was a stepping-stone to other places of work and the period spent in the first establishment was a period of search for other working places.

For what reasons do graduates change their jobs?

The first major cause is that graduates find the job does not meet their expectations. A graduate may occupy a position lower than he thinks he deserves. Working in the railways or in the power stations, for example, is considered lower than what the graduate expects. This observation was confirmed by graduates who worked or are currently working in such establishments. For example, some interviewees stated that they left their jobs (for example, the railways) because they were dirty. Another graduate who was working as a mechanic specialist in a beer factory is being pressured by his father and the family to quit the job because it is against their religion to work in a plant that makes alcohol. In certain circumstances a graduate will accept almost any other job, even one in which the remuneration might be lower.

Column IV of Table 4-3 serves to illustrate the above observation. For example, a considerable number of the interviewees left the electricity power station to work in other places; the shift system of the station is generally considered to be below the expectations of the graduates. The argument is also applicable to private workshops, where conditions of work are generally not acceptable to the graduates.

In-employment training is a very important factor that accounts for the change of the place of work. Most establishments in the three sectors require the graduates to undergo some kind of in-employment training; the nature and contents of these training

Table 4-3

Establishments with Case History of Interviewed Graduates Employed in Each

Establishments	Employed with Current Establishment as First Working Place	Coming from Other Establishments	Total of Currently Employed	Worked and Left the Establishment
Ministry of Education	5	3	8	1
Refinery	4	11	15	1
Ministry of Communications	7	8	15	0
Electricity Power Station	4	2	6	9
Broadcasting Station	1	10	11	0
Railways	1	4	5	4
Public Works	4	2	6	4
Natural Resources Dept.	1	1	2	0
Police Force	1	2	3	0
Cement Factory	2	1	3	2
Civil Aviation	2	2	4	0
Iron and Steel	0	3	3	0
Central Bank	0	2	2	0

His Own Business	1	0	1	4
Ministry of Finance	0	1	1	0
Blacksmith Workshop	1	0	1	0
Textile Factory	0	1	1	0
Aluminum Factory	1	0	1	0
Shoe Factory	1	0	1	0
Diesel Engine Factory	1	0	1	0
Foundry	0	0	0	1
Army Workshops	0	0	0	8
Pharmaceutical Factory	0	0	0	1
Ministry of Agriculture	0	0	0	2
River Dams	0	0	0	4
Working Outside Jordan	0	0	0	4
Aqaba Seaport	0	0	0	2
Small Workshops	0	0	0	4
Wet Batteries Factory	0	0	0	1
Total	37	53	90	53

Source: Interview Survey of 90 employed graduates.

activities differ from one employing establishment to another. The new skills acquired through in-employment training have different marketable values depending upon the existing and potential demand for these skills in Jordan and, more importantly, abroad.[1] On the basis of this analysis it can be seen that there are certain establishments in which workers acquire skills especially valuable in the labor market abroad. On the other hand, there are other establishments in which the acquired skills are not presently or potentially demanded either in the local or the foreign markets.

A good example of establishments in which a graduate acquires skills demanded by the foreign market is the refinery.[2] Nevertheless, of the total number of the interviewed graduates employed in the refinery, only one graduate worked and left it; of the fifteen interviewed, 11 worked in some other places before their current employment in the refinery. The eleven graduates were mainly attracted by the in-employment training program, which provides them with highly marketable skills abroad (see Table 4-3). Thus, when a graduate gets his first employment in the railways, for example, he considers this first working place as a stepping-stone to the refinery.

Remuneration may also be considered an important factor that affects the change of the place of work. Graduates working in

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[1]The question of graduates seeking employment abroad is further discussed in later pages.

[2]The role of the Refinery in training workers to go abroad is discussed in Chapter VI.

an establishment that pays a wage lower than those paid in other places would have an inducement to change the place of work. This is more true if the place in which they work does not offer other benefits that would make up the wage differential. Examples of such benefits are in-employment training that gives marketable skills, a job that would make it possible for the academically ambitious graduates to fulfil their ambitions in their spare time, or the location of the working place in the vicinity of the graduate's home. Some of these factors probably account for the fact that currently no graduates are found employed in small workshops. Four graduates worked in such places but later left to work in establishments that either give higher wages or provide some benefits to compensate for the lower salary (Column IV, Table 4-3).

Another factor that accounts for the change of the place of work is that the public sector attracts graduates from the private sector, because they hope that their employment will be made permanent, thus putting their salaries under the Civil Service Law. In this case a graduate becomes a civil servant. This occurs most often with the Ministries of Education and of Communications, the broadcasting station, and the civil aviation department.

Ambitious graduates may try to get employment in establishments that offer study grants for their employees. The Ministries of Education and of Communications and the broadcasting station are good examples. Thus there are graduates who leave their current working place to get employment in establishments that will fulfil

their ambitions for higher education. The academically ambitious graduates, working in establishments where the hours of work do not leave them any spare time, or where the work is conducted on a day-and-night-shift basis, would try to get employment in the establishments where the conditions of work are easy and where no night shift is included in the work schedule. The refinery, as an example, would not be the place for such graduates.

Finally, four graduates started their own businesses but after a time closed them and became employees (see Table 4-3). Lack of capital and experience were cited as the main reasons for the change from private business.

Graduates Seeking Higher Education

Industrial secondary schools in Jordan have a terminal curriculum; their stated function is to provide the students with the education and training needed to meet middle-level manpower requirements of industry in Jordan. Students of these schools, by definition, should start working after graduation. A change in the terminal nature of the school is a change in its functions. If it is found that a considerable number of graduates do not work but seek higher education, an implicit change is introduced in the functions of the school. (The Ministry has apparently recognized the need for a change in the functions of these schools. See Chapter III, p. 62, footnote.)

The problem of graduates seeking higher education can be approached from two points of view. The first is to know the views on this subject of the graduating students of the secondary industrial schools. This was investigated and analyzed in the section on students' aspirations in Chapter III. Research revealed that the core of the students' aspirations is higher education. Students were found to be planning to continue education after spending a period of time working, in Jordan or abroad, to earn the money needed for higher education. The second approach is to know what actually happens to the students after graduation.

Principal Finding of the Follow-up Survey

Of the total number of 352 graduates covered by the follow-up mail questionnaire, 15.4% (54 graduates) are studying abroad in institutes of higher learning. Of these 54 graduates studying abroad, 86% are studying in Yugoslavia, Germany and UAR (see Table 4-4).

The fact that most of the students recruited to the secondary industrial schools are from poor families leads one to question how these students are able to finance their higher education without a work period in which to save money. One possibility is study grants. The West German government is a major source of such grants. Students, especially those from the German-oriented Irbid school, go to Germany for about two years for further training. Upon their return, they are appointed teachers of their trades in the

industrial schools in Jordan. Table 4-4 indicates that 33% of the graduates studying abroad are in Germany. All students of this category are on study grants. The second means by which the rest of the graduates are studying abroad is a pool of family resources to finance the higher education of the graduate.

Table 4-4

Graduates Studying Abroad

Country	No. of Graduates	%
Yugoslavia	19	34
Germany	17	33
Egypt	11	20
Iraq	2	4
U. S. A.	2	4
India	1	2
Syria	1	2
Spain	1	2
Total	54	100

Source: Follow-up survey of 352 graduates.

Graduates Working in the Neighboring Arab Oil-Producing Countries

A persistent belief exists among educators and decision makers in the field of industrial education that Jordan is an exporter of skilled manpower to the oil-producing Arab countries. They believe that graduates of secondary industrial schools are among those exported. Plans to build more industrial schools are

presently based, to a certain degree, on this belief that Jordan is an exporter of secondary industrial school graduates.[3] Decision makers in the Ministry of Education claim that the exported graduates earn a comparatively high income, as compared with what can be earned in Jordan, and that part of this income is sent back home. Eventually Jordan gains this income. (Interview with Head of Curriculum Division.) Moreover, they believe that the exodus of graduates reduces the number of unemployed graduates in Jordan.[4] Thus, it can be said that one of the important implicit functions of the secondary industrial schools in Jordan is to export skilled manpower to the oil-producing Arab countries. To what extent do the industrial schools actually perform this function? This section attempts to answer the question.

Table 1-2 indicates that, of the 352 graduates, only 33 graduates are working abroad, that is 9.4% of the total. Does this number of graduates working abroad indicate that Jordan is an exporter of secondary industrial schools graduates? It is difficult to say exactly what percentage of graduates working abroad might justify the belief that Jordan is an exporter of secondary industrial school graduates; however, one can conclude that the actual number of graduates working abroad is not so great as it is

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[3]Ministry of Education--A.I.D./J., The Vocational Education Program in the Hashemite Kingdom of Jordan, 1962: a Survey Report (Amman: Ministry of Education, 1962), p. 35.

[4]Ministry of Education, Jordan, Circular No. 3/114/13803; Ministry of Education--A.I.D., op. cit., p. 27.

thought to be by the decision makers in Jordan. Their belief concerning the export of graduates is not highly supported.

The two major oil-producing Arab countries, Kuwait and Saudi Arabia, have in fact developed their own systems of occupational training and education. The number of graduates of these two systems suggests that Kuwait and Saudi Arabia have become reasonably self-supporting in the late fifties, more particularly Kuwait.[5] Workers who are imported are generally those who have more practical experience than the graduates.

The belief in question might have its origin elsewhere, in the other two systems of occupational training in Jordan, UNRWA and the private system of trade centers. Graduates of UNRWA centers, because of efficient placement and employment services, find good employment opportunities abroad. It is reported that 30% of the graduates found employment abroad.[6] Possibly occupational training leaders have generalized from this to include the secondary industrial school graduates as well in their impression of employment opportunities abroad.

A note should be added. The graduates of the Nablus school which had to be excluded from the survey are all of Palestinean

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[5]Beirut Regional Center for the Advanced Training of Educational Personnel in the Arab States, Fifth Presentation of Education in Kuwait (Beirut: Regional Center, 1966), pp. 98, 93; Beirut Regional Center for the Advanced Training of Educational Personnel in the Arab States, Fifth Presentation of Education in Saudi Arabia (Beirut: Regional Center, 1966), pp. 28, 29, 43.

[6]Ministry of Education--A.I.D./J, op. cit., p. 153.

origin. They might be more inclined to work abroad. This is an hypothesis held by the researcher and subject to further verification. An ex-principal of Nablus school stated during an interview that 40% of the graduates of that school go to work abroad. Although this statement is an opinion of the principal, it can be taken as an indication of a trend existing among Palestineans living in the Western Bank of Jordan. Thus, the belief in question might have originated from a generalization of what happens to the graduates of one school only.

Interviewed Employed Graduates on Work Abroad

Interviewed graduates were asked whether they had tried to work abroad. Table 4-5 shows the results of their answers. Those who applied to work abroad stated that they either did not receive an answer, or that the foreign employing establishment required a long period of actual work experience. It may be that the foreign labor market is becoming more limited and more selective. Recent graduates or those with few years of experience can rarely meet the new requirements. Those who preferred to work in Jordan did so either for family reasons or for patriotic feelings.

Graduates Seeking Clerical Jobs

Another common belief concerns the supposed aversion to manual-technical jobs. Whether the graduate comes from a general or from a vocational school, many claim he first looks for a

Table 4-5

Interviewed Graduates and the Work Abroad

Category of Graduates	No.	%
Applied to work abroad	44	48.8
Did not apply	42	46.6
Worked abroad and came back	4	4.6
Total	90	100.0

Source: Interview survey of 90 employed graduates.

white-collar clerical job. It is held that the aversion is more true of the general school graduates than the vocational school graduates. The analysis that follows seeks to discover whether there are industrial school graduates who are employed in clerical jobs. Secondly, the analysis aims to show the attitude of employed graduates towards manual-technical work in general.

Related Research

An aversion to manual-technical work is believed to be prevalent in the countries of the Arab world. Harby et al. point out that most parents and pupils still think in terms of white-collar jobs.[7] El-Kusi emphasizes the same observation by saying that "education is still being looked upon as a means by which

[7]K. Harby, A. Afifi, and M. El-Ghannam, Technical Education in the Changing Arab World (Cairo: The Anglo-Egyptian Bookshop, 1965), p. 183.

'manual work' can be avoided."[8] In a Ford Foundation Report on the administration of vocational education in Lebanon, it was stated that there is an aversion to manual work among certain parts of the population.[9]

Such beliefs are only hypothetical. Empirical data are needed to substantiate them. It is entirely possible that such a belief is outmoded. There has been, so far as the researcher knows, only one study which tested this belief among industrial school and training-center graduates in an Arab country. It was done in Tunisia. Erling Jorgenson et al. tested the hypothesis that technically trained Tunisians prefer white-collar jobs.[10] The study did not confirm the hypothesis.

Principal Findings on Clerical Jobs

Table 4-6 indicates the distribution of interviewed employed graduates in manual-technical and white collar jobs.

The graduates employed in manual-technical jobs were asked if they would accept a clerical job (a) if the salary were higher than their present salary, (b) even if the salary were lower, or

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[8] Abdul-Aziz el-Kusi, A Survey of Educational Progress in the Arab States, 1960-1965 (Beirut: Regional Center, 1966), p. 82.

[9] Ford Foundation, Report on the Administration of Vocational and Technical Education in Lebanon (Beirut, 1963), p. 23.

[10] Erling Jorgensen, Utilization of the Graduates from Technical and Vocational Training Institutes in Tunisia (Tunis: Ford Foundation, 1966), p. 5.

(c) not at all. Table 4-7 gives the findings.

The findings of the survey of the employed graduates do not support the hypothesis that there is aversion among industrial school graduates towards manual technical work.

Table 4-6

Interviewed Graduates Working in Technical Manual Jobs and in White Collar Clerical Jobs

Category	No.	%
Manual-technical jobs	86	95.5
White collar jobs	4	4.5
Total	90	100.0

Source: Interview survey of 90 employed graduates.

Table 4-7

Attitude of Graduates Employed in Manual Jobs Toward Clerical Jobs

Category	No.	%	
Accept if wages were higher	17	19.5	)
			) 25.3%
Accept even if wages were lower	5	5.8	)
Prefer to stay in manual jobs	64	74.7	
Total	86	100.0	

Source: Interview survey of 90 employed graduates.

CHAPTER V

THE INDUSTRIAL SCHOOL CURRICULUM AND THE EMPLOYMENT SYSTEM

The Curriculum and the Methodology of Rating It

The Four Curriculum Components

The curriculum of the secondary industrial schools in Jordan provides its students with skills and knowledge which can be divided into four main components, two of which are specific in nature and two of which are general. The four components are:

1. The specific skills component. This represents all trade-related skills. Specific skills are acquired in accordance with the trade learned in the workshop.

2. The specific theoretical component. This component is composed of technological and trade-related theoretical courses: technology, applied mathematics, technical drawing, and shop management.

3. The general skills component. This refers to the general practical skills acquired in the first-year workshop orientation course and the general skills acquired along with the specific skills component. It also includes skills that were acquired in the practical industrial courses of the preparatory schools.

4. The general theoretical component. This component is both scientific and literary. Languages, both mother tongue and foreign, religion, mathematics, and physics are provided.

This research attempts to determine:

a) Which of the four curriculum components are being utilized in the employment system and which ones are not utilized and thus "wasted."

b) What new curriculum components, substitutes for the un-utilized ones, are in fact being utilized in the employment system.

In other words, the purpose is to analyze the respective roles of the industrial schools and the employing establishments, under present arrangements, in the preparation of workers for middle-level manpower occupational positions.

The Rating Method

An employed graduate is by definition a worker who has learned a particular trade in the school and performs a job in the employing establishment. It is important to determine the degree of relationship between the trade learned in school and the job. In order to determine which of the four curriculum components are utilized by the worker in the employing establishment, the following method of rating was applied: Each of the four curriculum components was given a positive or a negative sign depending upon whether it was utilized by the graduate. Thus,

1. If an employed graduate gets four positive signs, it means that he is utilizing all four curriculum components, and his education at school is judged to be closely related to his present job. Graduates getting four positive signs are grouped in the closely related category, designated CR (Closely Related).

2. If an employed graduate gets two or three positive signs, it means that he is utilizing two or three components and has acquired one or two components by formal or informal in-employment training or experience. School education and training is judged to be broadly related to the job. Graduates getting either two or three positive signs are grouped in the broadly related category, designated BR (Broadly Related).

3. If an employed graduate gets one positive sign, it means that he is utilizing one school-learned component and has acquired the remaining components by formal or informal in-employment training and experience. The school curriculum is judged to be unrelated to the present job of the employed graduate. Graduates getting one positive sign are grouped in the unrelated category, designated UR (Unrelated).

The researcher discussed with each graduate the nature of his job and the skills and theoretical knowledge utilized. Usually the graduate could state which of the four components were useful to him and what components learned in the employing establishments were substitutes for the unused school components. In most cases it was possible for the researcher to visit the graduate in his

Table 5-1

Summary of Data of Graduates in the Employment System

Sch.	Trade	Current Job	Gen. Skill	Specif. Skill	Gen. Theory	Specif. Theory	Rating	Duration of Job Entry Training or Acquiring New Trade	Estimated Duration of In-employment Training in the Trade
1	Carpentry	Aluminum frame fitter	+	-	+	-	2	3m	7m
2	Auto-mech.	Boilers operative and maintenance	+	-	+	-	2	3m	12m
3	Plumbing	Central heating operative	+	-	+	-	2	2w	1m
4	Electricity	Bld. Electricity repair	+	+	+	+	4	1m	12m
5	Auto-mech.	Diesel engine repair	-	-	+	-	1	4m*	4m
6	Hot metals	Workshop blacksmith	+	-	+	+	3	4m	24m
7	Hot metals	Topography drawing	-	-	+	-	1	4m*	4m
8	Auto-mech.	Air-condition maintenance	-	-	+	-	1	12m*	12m
9	Cold metals	Fitter	+	+	+	+	4	3w	12m
10	Plumbing	Plumber	+	+	+	+	4	0	12m
11	Elec. Bld.	Electricity maintenance	+	+	+	+	4	1m	12m
12	Hot metals	Unit operative refinery	-	-	+	-	1	6m*	4m
13	Cold metals	Unit operative refinery	-	-	+	-	1	6m*	4m
14	Hot metals	Unit operative refinery	-	-	+	-	1	6m*	4m

15	Hot metals	Unit operative refinery	-	-	+	-	1	6m*	4m
16	Electricity	Unit operative refinery	-	-	+	-	1	6m*	4m
17	Cold metals	Mechanical drawing	-	-	+	-	1	6m*	12m
18	Electricity	Electrician refinery	+	-	+	+	3	6m*	12m
19	Electricity	Electrician refinery	+	-	+	+	3	6m*	12m
20	Auto-mech.	Unit operative refinery	-	-	+	-	1	6m*	4m
21	Hot metals	Unit operative refinery	-	-	+	-	1	6m*	4m
22	Cold metals	Unit operative refinery	-	-	+	-	1	6m*	4m
23	Cold metals	Unit operative refinery	-	-	+	-	1	6m*	4m
24	Auto-mech.	Unit operative refinery	-	-	+	-	1	6m*	4m
25	Auto-mech.	Unit operative refinery	-	-	+	-	1	6m*	4m
26	Hot metals	Unit operative refinery	-	-	+	-	1	6m*	4m
27	Cold metals	Micro-wave operative	-	-	+	-	1	6m*	3m
28	Electricity	Electrical maintenance	+	-	+	-	2	4m	4m
29	Cold metals	Comm. Network control	-	-	+	-	1	3m*	3m
30	Electricity	Electrician	+	+	+	+	4	1w	3m
31	Auto-mech.	Telephone operator	-	-	+	-	1	1w	1w
32	Cold metals	Comm. Network control	-	-	+	-	1	3m*	3m
33	Electricity	Cable welder	-	-	+	-	1	6m*	6m
34	Electricity	Cable welder	-	-	+	-	1	6m*	6m
35	Electricity	Cable welder	-	-	+	-	1	6m*	6m
36	Cold metals	Telephone operator	-	-	+	-	1	1w	1w
37	Plumbing	Central heating maintenance	+	+	+	+	4	2w	6m

Table 5-1--Continued

Sch.	Trade	Current Job	Gen. Skill	Specif. Skill	Gen. Theory	Specif. Theory	Rating	Duration of Job Entry Training or Acquiring New Trade	Estimated Duration of In-employment Training in the Trade
38	Electricity	Wireless operator	-	-	+	-	1	3m*	3m
39	Auto-mech.	Telephone repair	-	-	+	-	1	2m*	2m
40	Hot metals	Comm. network repair	-	-	+	-	1	3m*	3m
41	Cold metals	Comm. network repair	-	-	+	-	1	3m	3m
42	Cold metals	Industrial preparatory teacher	+	-	+	+	3	1m	--
43	Hot metals	Industrial preparatory teacher	+	-	+	+	3	1m	--
44	Cold metals	Industrial secondary teacher	+	+	+	+	4	--	--
45	Electricity	Audio-visual equip., repair	+	-	+	+	3	1w	3m
46	Auto-mech.	Duplicator operator	-	-	+	-	1	1w	1w
47	Electricity	Industrial secondary teacher	+	+	+	+	4	24m*	--
48	Electricity	Typewriter repair	-	-	+	-	1	3m	3m
49	Cold metals	Industrial secondary teacher	+	+	+	+	4	24m*	--
50	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m

51	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m
52	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m
53	Electricity	Bld. electricity maintenance	+	+	+	+	4	1w	12m
54	Electricity	Electrical equip. maintenance	+	-	+	+	3	4m	5m
55	Electricity	Electrician chief	+	+	+	+	4	12m	24m
56	Electricity	Electrician	+	+	+	+	4	1m	12m
57	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m
58	Electricity	Electrician	+	+	+	+	4	1m	12m
59	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m
60	Electricity	Recording operator B.S.	-	-	+	-	1	1m	1m
61	Auto-mech.	Power generator operator	+	-	+	-	2	1m	3m
62	Electricity	Electrician maintenance	+	+	+	+	4	2m	12m
63	Electricity	Cable welder	-	-	+	-	1	2m	2m
64	Electricity	Network repair	+	-	+	+	3	3m	3m
65	Electricity	Network repair	+	-	+	+	3	3m	3m
66	Auto-mech.	Power generator operator	+	-	+	-	2	1m	4m
67	Hot metals	Fitter	+	+	+	+	4	2m	12m
68	Cold metals	Mech. drawing	-	-	+	+	2	6m*	6m
69	Hot metals	Welder	+	+	+	+	4	1m	6m

Table 5-1--Continued

Sch.	Trade	Current Job	Gen. Skill	Specif. Skill	Gen. Theory	Specif. Theory	Rating	Duration of Job Entry Training or Acquiring New Trade	Estimated Duration of In-Employment Training in the Trade
70	Hot metals	Railways boilers	+	-	+	+	3	3m	7m
71	Cold metals	Fitter	+	+	+	+	4	1m	12m
72	Auto-mech.	Mechanic	+	+	+	+	4	1w	12m
73	Auto-mech.	Vehicle inspection	+	+	+	+	4	6m	12m
74	Auto-mech.	Diesel engine repair	+	-	+	+	3	6m	12m
75	Auto-mech.	Diesel engine repair	+	-	+	+	3	6m	12m
76	Cold metals	Clerk	-	-	+	-	1	1w	1w
77	Hot metals	Metal work super	+	+	+	+	4	12m	12m
78	Auto-mech.	Vehicle repair	+	+	+	+	4	1m	12m
79	Hot metals	Welder	+	+	+	+	4	1m	6m
80	Hot metals	Welder	+	+	+	+	4	1m	6m
81	Cold metals	Workshop foreman	+	-	+	+	3	3m*	24m

82	Cold metals	Fitter	+	+	+	+	4	3m*	12m
83	Plumbing	Plumber	+	+	+	+	4	--	12m
84	Auto-mech.	Diesel engine operator	+	-	+	+	3	4m	12m
85	Electricity	Electrician	+	-	+	+	3	2w	3m
86	Cold metals	Mechanic	+	-	+	+	3	5m	18m
87	Electricity	Power generator operator	+	-	+	+	3	1m	6m
88	Plumbing	Storekeeper	-	-	+	-	1	1w	1w
89	Hot metals	Clerk	-	-	+	-	1	--	--
90	Hot metals	Policeman	-	-	+	-	1	9m	9m

Source: Interview of 90 employed graduates.

*In-employment training

m = month(s)

w = week(s)

actual work situation and thus by personal observation to check some of the judgments obtained in the interview. Employers and work-supervisors were also consulted when possible.

It was also important to get a description of any training undergone by the graduate in the initial stages of his employment. Information was sought from the training personnel, the employers, and the employed graduates in order to reveal the role of the employment system in the occupational training of the worker.

Findings on Curriculum Components

Individual Curriculum Components Utilized

Table 5-2 shows the findings related to each of the four curriculum components. For each of the four components, the table gives the number of students who utilized each of the school-learned curriculum components and the number of graduates who learned substitutes for unutilized components in the employment system.

It is noteworthy that the percentage of graduates utilizing the school-learned specific skills component ranked lowest (27.7%), while the percentage of those utilizing the school-learned general theory component ranked highest (100%).

Table 5-2

Utilization of Individual Curriculum Components

Category Components	Graduates Learned in the Educational System		Graduates Learned in the Employment System	
	No.	%	No.	%
Specific skills	25	27.7	65	72.3
Specific theory	42	46.3	48	53.7
General skills	48	53.7	42	46.3
General theory	90	100.0	0	0

Source: Interview of graduates as summarized in Table 5-1.

Groups of Curriculum Components

The findings will be analyzed now in terms of groups of curriculum components. The data disclosed certain uniform characteristics. All graduates were utilizing at least one of the curriculum components. In all cases the general theory component was utilized. When the data were coded, four categories of group components became apparent:

1. General theory component only
2. General theory component plus one other component
3. General theory component plus two other components
4. General theory component plus three other components

Further study of the data revealed the nature of each of the categories. As has been shown, the category with only one positive

sign (defined in the preceding section as the unrelated category) contains the general theory component. The category with two positive signs contains the general theory and the general skills components (defined as the broadly related category). The category with three positive signs contains the general theory, the general skills, and the specific theory components (also defined as the broadly related category). The category with four positive signs contains all four components (defined as closely related). In other words, only the graduates of the closely related category are utilizing the specific skills component.

The analysis of the rating data produced a cumulative scale in which the utilization of a component in the scale necessarily means that the graduate is using all the components below it in the scale (see diagram of scale below). The general theory component has the highest frequency of use, and in descending order of frequency come the general skills, the specific theory, and the specific skills components.

Diagrammatic Representation of the Scale

	C R	B R	B R	U R
	S S	- -	- -	- -
	S T	S T	- -	- -
	G S	G S	G S	- -
	G T	G T	G T	G T
Rating	4 +	3 +	2 +	1 +

The analysis of the data in terms of groups of curriculum components helps to determine the roles that were played by the school and the employing establishment in the training of the graduates. To the graduates who utilized the four school curriculum components, the employment system either played no essential training role or only a supplementary, upgrading one. For all the graduates who are utilizing three, two, or one of the school curriculum components, the employment system supplied substitutes for the unutilized one(s) (see diagram below).

Role of the Employing Establishment in Training

G R	B R	B R	U R
- -	S S	S S	S S
- -	- -	S T	S T
- -	- -	- -	G S
- -	- -	- -	- -
Rating	1 -	2 -	3 -

Table 5-3 shows the number of graduates utilizing each of the four groups of (school-learned) curriculum components and the number of those who learned substitute components in the employing establishment.

Table 5-3

Utilization of Groups of Curriculum Components

Educational System			Employment System		
School Components Utilized	Graduates Utilizing No.	%	Components Learned In-employment	Graduates Learning No.	%
First group (C R)					
1 - Specific skills 2 - Specific theory 3 - General skills 4 - General theory	25	27.2			
Second group (B R)					
			1 - Specific skills	17	18.7
2 - Specific theory 3 - General skills 4 - General theory	17	18.7			
Third group (B R)					
			1 - Specific skills 2 - Specific theory	6	7.6
3 - General skills 4 - General theory	6	7.6			
Fourth group (U R)					
			1 - Specific skills 2 - Specific theory 3 - General skills	42	46.5
4 - General theory	42	46.5			
Total	90	100.0		65	72.8

The role of the general theory component is significant. It is the component common to all four categories of graduates. For those who found that only one, two, or three components were useful in the employing establishment, the general theory component was helpful in learning substitutes for the unutilized school components. Even for those who found the four school curriculum components useful, the general theory component will be useful to them in upgrading their skills. The general skills component was second in usefulness to the general theory component, by giving the graduate the ability to learn the missing components, especially the specific skills.

Notes on the Closely Related Category

Two main groups of jobs appear in the closely related category (Table 5-1). These are the jobs of teachers of trade and industrial courses in the preparatory and secondary industrial schools and of persons who are in charge of the operation, maintenance, or repair of machines or equipment that are not peculiar to a particular establishment. Thus, electricians are in charge of electrical installations in buildings. Welders and fitters do the specific job which they have been trained for in a cement factory or in the railways or in a blacksmith workshop.

The graduates of this category were asked to estimate how long it would take someone with a good background in general education to acquire their school-learned specific skills in the

employing establishment. The graduates' estimates are given in Table 5-4. Employers and supervisors confirmed some of the answers of the graduates. More evidence on this comparison is provided in the chapter on work-companions. Sixteen estimated 10 to 12 months of training for electricians, fitters, plumbers, and mechanics, while 5 of the 25 graduates gave an estimate of 4 to 6 months for welders and operatives of electrical installations and central heating.

Table 5-4

Estimated Periods for Getting the Specific Skills in the Employing Establishment for the Closely Related Category

Category	4-6m	10-12m	13-over	Total
Building electrician		6		6
Fitter		4		4
Plumber		2		2
Electricity operative	1			1
Central heating maintenance	1			1
Teacher			3	3
Chief electrician			1	1
Welder	3			3
Mechanic		3		3
Metal W. S. super		1		1
Total	5	16	4	25

Source: Interview of 90 employed graduates as summarized in Table 5-1.

The 25 of the 90 employed graduates whose school curriculum was judged to be closely related to the job stated that they had a job-orientation period during which they developed self-confidence and self-reliance. The period varied from two weeks to two months, with the exception of the teachers included in this category who had two years of further education and training abroad (Table 5-5).

Table 5-5

Length of the Job Orientation Period of the Closely Related Category Graduates

Category	No.	%
1-2 weeks	7	
3-4 weeks	10	
5-6 weeks	1	
7-8 weeks	2	
9-48 weeks	3	
Two years	2	
Total	25	

Source: Interview survey of 90 employed graduates as summarized in Table 5-1.

Notes on the Unrelated Category

In this category, the only utilized school curriculum component is the general theoretical component. All of the other three components were learned in the employing establishment either in a formally organized training program, such as that of the refinery, or through some kind of actual on-the-job apprenticeship type training.

The category of graduates with unrelated school education and training has a range of jobs that includes trades not taught in the industrial school and some new tasks that are relevant only to a particular establishment. Three employing establishments that require skills not taught in the schools are the refinery, the Ministry of Communications and the broadcasting station. The acquisition of specific skills in the employing establishments required from one to six months (Table 5-6).

Notes on the Broadly Related Category

For this category, graduates either lacked the specific skills only, or the specific skills and specific theory components. All of them utilized in the employing establishment the general skills and the general theory components. Graduates whose school trade was auto mechanics, for example, did not learn the specific skills for diesel engines in the school. They had to learn these skills in the employing establishment. Graduates who are building electricians had to learn new specific skills in the employing establishment, because their jobs are related to some electrical equipment with which they had no pre-employment acquaintance. Graduates of this category learned the missing specific skills component in a period that ranged from one month to six months (Table 5-7).

Table 5-6

Jobs of the Un-related Category Graduates and Length of In-employment Training in Job Related Skills

Category	Type of Training	Months							Total
		0-1	1-2	3-4	5-6	7-8	9-10	11-13	
Diesel engine repair	Sent abroad			1					1
Topography & Mech.	Private institution			2					2
Air conditioning maintenance	Foreign experts							1	1
Recording B.C.S.	On the job training			6					6
Unit operative refinery	Formal est. training				12				12
Cable welder	On the job		1						1
Typewriter repair	On the job training			1					1
Clerks	Job orientation	3							3
Policeman	Training formal						1		1
Duplicator operator	On the job training	1							1
Micro-wave operator	Formal est. training			1					1
Com. network control	On the job training			4					4
Telephone operator	On the job training	2							2
Com. cable welder	Formal est. training				3				3
Wireless operator	On the job training			1					1
Telephone repair	On the job training		2						2
Total		6	3	16	15		1	1	42

Source: Interview of 90 graduates as summarized in Table 5-1.

Table 5-7

Time Required by the Broadly Related Category Graduates to Acquire the Missing Components

Category in Months	No. of Graduates
1-2	8
3-4	9
5-6	6
Total	23

Source: Interview of graduates as summarized in Table 5-1.

These graduates were asked to estimate the length of in-employment training they would have needed had they had only general education. Six of them said they would have required from one to three months, five from four to six months, two from seven to nine months, five from ten to twelve months, and five from 13 to 15 months.

Conclusions as to the Specificity and Generality of the Education and Training Provided by the Educational System

The educational system, through the secondary industrial schools, supplied the market with what are supposed to be trained skilled manpower for middle-level occupational positions. However, when the graduates of the industrial schools get employment, they

find themselves in the position of learning new job-related specific skills. Thus, the employment system, through its employing establishments, had to provide new specific skills for 72.3% of the employed graduates, and to provide new specific theory for 53.7% (Table 5-2).

As a corollary, it can be stated that the more specific the training provided by the educational system, the less likely it is to be relevant to the actual job-related skill needs of the employment system.

Moreover, the employing establishments had to provide new general skills for 46.3% (Table 5-2) of the employed graduates, while the general theory component of the school was useful to all graduates in the in-employment training activities. As a corollary, it can be stated that the more general and theoretical aspects of the training and education provided by the educational system are most likely to be relevant to the actual job-related needs of the employment system.

CHAPTER VI

THE ROLE OF THE EMPLOYMENT SYSTEM IN THE FORMAL TRAINING OF THE GRADUATES

Graduates whose school curriculum is unrelated to their current jobs, i.e., those who are utilizing only the general theory component, get one of two types of training. The first is on-the-job training where a trainee is assigned to a senior co-worker from whom he learns, initially by observation and then by guided practice. The length of training differs from one trainee to another and from one job to another. The second is formal in-employment training. Here, the graduate is either a member of a group of trainees who attend a full-time training program in the employing establishment for a specific period of time, or is a part of a group of trainees who attend a training program for part of the day and are trainee-workers who learn in actual job situations for the rest of the day.

There are two employing establishments which train workers in formally organized training programs. The aim of the programs is to enable the trainees to acquire the specific skills needed by these establishments, in addition to some general skills and the specific theory related to their jobs. The first is the Ministry of Communications and the second is the Jordan Petroleum Refinery. The focus in this chapter is the training activities of the refinery in job-related skills.

Historical Background of the Refinery

The Jordan refinery is one of two establishments that have developed their own system of training the manpower they require at all occupational levels. The refinery provides training facilities for new recruits and already-employed personnel. The latter activities include, among other things, programs for continuous up-grading of the technical skills of high level personnel in the latest developments and techniques in the refining industry. In fact, the refinery can be considered another educational and training system in Jordan.

The refinery started production in late 1961. The operating personnel were skilled or semi-skilled persons recruited from two sources. The high level skilled personnel were Jordanian engineers who were sent to Italy for a period of eighteen months. Some of these were then sent to Holland for further training. Middle-level personnel were skilled workers who acquired their skills through practical experience in oil refineries in Iraq, Kuwait, Aden, or Saudi Arabia. The educational background of these workers was generally elementary level; some of them were illiterates.[1]

In addition to the locally recruited personnel, there were a few Italians, Dutch, and Americans who helped in the initial stages of construction and production. However, due to language

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[1]Interview with Y. Dajani, Head Engineer of the Jordan Refinery, and R. Malhees, Technical General Director of the refinery.

barriers, their technical help was not as effective as expected.[2] The few Jordanian engineers with little experience in the oil refinery industry and with little practical orientation dominated the operational and engineering scenes and provided the actual technical leadership. Since communication is important to the Jordanian personnel, the number of foreigners decreased and the company is now almost completely run by Jordanians.[3] Table 6-1 shows the number of foreign and Jordanian engineers over the past seven years. Note that in 1960 27% of all engineers were foreigners, while in 1967 the number had decreased to 5%.

Training Activities of the Refinery

The training programs have three aims. The first is to provide summer practical training opportunities for university engineering students and industrial secondary school students. The second is to provide theoretical and practical training programs for the new recruits and the already-employed workers. The third is to provide an annual trained personnel supply to meet the increasing demands of the oil industry in neighboring oil-producing countries.

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[2]Interview with R. Malhees.

[3]Board of Directors, Annual Report, 1966 (Amman: Jordan Petroleum Refinery, 1967), p. 10.

Table 6-1

Number of Foreign and Local Engineers in the Last Seven Years

Year	Foreign		Local		Total
	No.	%	No.	%	
1960	7	27	19	73	25
1961	10	37	17	63	27
1962	12	40	19	60	31
1963	13	38	21	62	34
1964	9	24	28	76	37
1965	5	13	35	87	40
1966	4	10	41	90	45
1967	2	5	41	95	43

Source: Refinery documents

Summer Training Facilities

The refinery provides summer training facilities for university engineering students. University students are appointed as trainees in the various units of the operation and engineering departments. The trainees are assigned to work with head engineers. One important aspect of this training program is that all the trainees are paid a nominal sum of money and all of them sign a contract, the most important item of which is the stipulation that training in the refinery does not mean a future employment commitment on the part of the industry. However, other things being

equal, the summer training gives the student trainee an advantage over other university applicants if he does apply for employment in the refinery after graduation.[4]

The same training facilities are provided for some of the students of the secondary industrial schools who, through school and refinery arrangements, are selected to get their summer training in the refinery. Students are trained in the plumbing, welding, electrical, and auto-mechanic workshops. Again, training by the refinery does not mean future commitment. Both university and industrial school student trainees are given certificates at the end of the training period signifying the time spent and the type of practical training acquired.

Training for All Occupational Levels

The refining industry is dependent on two basic sciences: chemistry, in its production and operational processes, and physics, in the engineering aspects. These two basic sciences appear in various forms of engineering in the top operational and production levels, and they also form the foundations for the specific skills and knowledge needed for certain tasks at the middle and lower occupational levels.

The educational background of the high level personnel reveals the type of scientific substructure predominant in the

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[4]Interview with Y. Dajani.

refinery. This substructure necessarily determines the basic principles underlying the tasks and required skills in the middle-level occupational positions. Table 6-2 clearly indicates that the most significant science in the operational and production aspects of the refinery is chemistry.

Table 6-2

Principal Sciences Utilized by Engineers in the Operation and Production Section

Educational Background	Number
Chemistry	7
Geology	3
Physics	5
Chemical engineering	6
Total	21

Source: Refinery documents

In the engineering section[5] there are 18 engineers: 13 of them are mechanical engineers, 4 electrical, and one civil.[6] There are two engineers in the administrative section.

In theory and practice the refinery meets its own needs in the middle and lower occupational levels by a built-in mechanism of

[5]Refinery engineers use the term engineering section to refer to the repair and maintenance sections of the refinery. This is to distinguish them from the operational units, which refer to the processing of the oil.

[6]Refinery documents.

self-developed, in-employment training programs. At the higher levels, engineers also have programs to orient them to the kind of work required in the refinery. The following is an analysis of the training programs for the employees of the refinery with more concentration on middle-level manpower training, since this is the main interest of the present research.

1. Training programs for newly hired university graduates. Every newly recruited university graduate takes an orientation program for 128 days, after which he is permanently employed and becomes an Assistant Shift Control.[7] Table 6-3 shows the number of ASC's (Assistant Shifts Control) who were trained during the last five years. However, there is purpose beyond orientation. The program is a test of ability to adjust to the working conditions of the refinery. Some recruits quit the job during this period of orientation.[8]

2. Training for middle- and lower-level occupational positions. Skilled or semi-skilled persons work in the units of the operation and production section or in those of the engineering section. Secondary industrial school graduates work in both sections. Other personnel are graduates of UNRWA training centers or the private training centers. Still others, and they are the majority, are persons who have either secondary general or only

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[7] Y. Dajani and R. Malhees, Suggested Training Program.

[8] Interview with Y. Dajani.

Table 6-3

Assistant Shift Controls
Trained 1963/1967

Year	Number Trained
1963	3
1964	7
1965	10
1966	1
1967	1
Total	22

Source: Refinery documents

Table 6-4

Educational Background of Persons Employed
in the Operation-Production and
Engineering Sections

Category	Secondary Industrial Schools	UNRWA & Private Training Centers	Secondary & Elementary Ed. & Practical Training	Total
Engineering section	10	23	153	186
Production-operation section	42	32	251	325
Total	52	55	251	325

Source: Refinery documents

elementary education and who got their skills by practical training either in the refinery itself, in the oil industry establishments of other Arab countries, or, in the case of those in the engineering section, in small workshops. All acquired the necessary refinery specific skills in the refinery itself in the built-in mechanism of the in-employment training programs.

Of particular interest to this research project are the 52 workers (12% of the total) who are graduates of the secondary industrial schools. Of these, it can be stated that all 42 in the operation and production section acquired the general skills, the specific skills, and the specific theory components utilized in their present jobs in the refinery itself (Table 5-1). The role played by their previous educational and training background is limited to the general theory component. In contrast to this group in the operation-production section, some of the 10 graduates employed in the engineering section (repair and maintenance) utilized all the school-learned curriculum components, while others learned new ones in the refinery.

The method of training graduates employed in the operation and production section follows.

(a) Induction program. All newly appointed personnel are given an induction course in the first few days of their employment. They are usually introduced to all units of the refinery, oriented to safety measures, and given some written literature on the refinery. The induction course was initiated

in June 1966. Betwee June 1966 and August 1967, 128 trainees went through this induction course.[9]

(b) Six-month practical on-the-job and theoretical program. New recruits of all educational backgrounds are given a six-month probation period. In this period all new recruits are considered trainees. Each recruit is appointed to a unit of the operational-production section. There he comes under the close supervision of a senior work-companion. The trainee starts with observation, and then he is asked to do simple tasks.

Concurrently, the trainee is supplied with manuals pertinent to the unit he is working in. (The manuals are either in English c: Arabic, but most of the scientific terms in the Arabic version are in English.) Besides this, there is a job-breakdown manual prepared by engineers and foremen. The learning principle applied is that every task is divided into several sub-tasks. Every sub-task leads to a higher one until the final required task is reached.

During this period the trainees attend theoretical lectures concerned mainly with the basic principles of physics, chemistry, and mathematics that have direct relation to the operational and production aspects of the refinery. These six month lectures are usually given for all middle-level personnel, not only the trainees. Certificates are awarded on the basis of attendance, although tests

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[9]Refinery documents.

are occasionally given to find out how much the trainee gained in these lectures.[10] A trainee, after finishing the six-month training, can continue to attend other lectures and get a certificate in the subject taught. Thus these lectures are in fact a continuing source of information and knowledge about the refining industry, and they represent an attempt at perpetual upgrading of the workers technically. All graduates interviewed showed a positive attitude towards these lectures. Most of them had attended more than one course and intend to attend more.

During the six months of the training program, periodic progress reports are submitted concerning every trainee. Permanent employment depends primarily on these reports. Promotion from one grade to another depends on the progress of the worker, his ability to acquire new skills and do higher technical tasks than previously. The assessment of the trainee or the worker by his supervisor includes: (1) quantity of work, (2) quality of work, (3) ability to learn, (4) reliability, (5) sense of responsibility, (6) cooperation, (7) initiative, (8) appearance and personal relations.[11]

3. Seminars for high level personnel. High level personnel, engineers and scientists, attend seminars for the exchange of ideas between the day staff, highly qualified and experienced persons in the petroleum industry, and the shift staff, who are relatively new

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[10] Interview with Y. Dajani.

[11] Refinery documents: Assessment Sheet.

in the industry. High level engineers are given scholarships for further study. They are also sent to conferences when opportunities permit. These ar consi ered learning experiences, because participants in conferences normally come back with new ideas in the petroleum industry.

Training Personnel for Oil-Producing Countries

In the early stages of its productive life, the refinery was dependent upon the oil companies in neighboring countries as sources of skilled manpower. At present the situation is reversed; the refinery is now an exporter of skilled workers. Every year at least five well-trained workers go to the neighboring oil-producing Arab countries. The refinery is aware of this and has no objection to employees leaving. In effect, this is a voluntary training service rendered by the refinery.

This regular drain of workers has led to a policy of maintaining a reserve of trained persons to meet a possible annual shortage. A 10% surplus is maintained at all personnel levels and more at the middle-level.

CHAPTER VII

WORK-COMPANIONS OF THE GRADUATES

Aims of the Survey

Work-companions are workers of the same employing establishment who do the same kind of jobs and tasks and are of approximately the same age as the employed graduates of the secondary industrial schools, but who have different educational and training backgrounds. The researcher interviewed work-companions of the graduates in order to make two comparisons between the two groups: (1) their educational backgrounds and (2) the means by which the companions acquired their present skills and the period needed for that, as compared with the graduates' three years of formal training in the industrial school plus any in-employment training.

Notes on Limitations of the Work-companions Analysis

Some of the 90 employed graduates did not have work-companions. Teachers in industrial school workshops, for example, do not have counterparts of other educational backgrourd. The graduate who has his own plumbing workshop, the store-keeper in the Bata Shoe factory, the man in charge of an air-conditioning installation, and others do not have work-companions. Thus the total number of graduates who have companions is approximately 70. Of

the twenty establishments employing the graduates (see Table 1-7), ten establishments employ 66 graduates (see Table 1-8). In each of these ten establishments, two or three companions were interviewed, making the total number of companions interviewed 22. As for the sample size, the 22 interviews with work-companions provide a reasonably adequate indication of the situation with respect to the 70 industrial school graduates employed in Jordan who have work-companions, especially considering the fact that many of these are employed in the same establishments and therefore have the same work-companions.

Table 7-1 shows in column (1) the present employing establishment. Column (2) indicates the years of schooling (general school) of each worker. The current job is indicated in column (3). Following this is the method by which the worker got his skills (column 4), the place of training (column 5), and the amount of time spent in training (column 6). If the worker was a trainee, then he was a companion of the graduate in a training program. E.Tr.SS (column 7) means that the worker is attending the evening training course held in the secondary industrial school. Column (8) indicates the period of in-employment training the graduate of the industrial school has undergone.

Table 7-1 indicates that 10 of the interviewed work-companions have only 3 to 6 years of elementary education, while 12 work-companions have from 7 to 12 years of general education. It is interesting to look at these varied educational backgrounds

Table 7-1

Summary of the Work-companions Interview

(1) Establishment	(2) Educ. (Yrs)	(3) Job	(4) Training Status	(5) Place of Training	(6) Time	(7) Extra Training	(8) Graduate Period of Training In-employment
M. Ed.	9	Typewriter repair	Trainee	M. Ed. Workshop	3m	--	3m
M. Ed.	6	Duplicator repair	Trainee	M. Ed. Workshop	3w	--	3w
M. Comm.	12	Cables repair maintenance	Trainee	Formal training M. Comm.	5m	--	6m
M. Comm.	9	Cables repair maintenance	Trainee	Formal training M. Comm.	6m	--	6m
Refinery	12	Lab analyst	Trainee	Refinery	6m	--	6m
Refinery	12	Quantity control	Trainee	Refinery	6m	--	6m
Refinery	6	Electrician	Apprentice	Elect. Workshop	18m	E.Tr.SS	6m
Elect. power station	10	Mechanic	Apprentice	Found. Workshop	12m	--	1m
Elect. power station	6	Deisel mechanic	Apprentice	Army Workshop	18m	--	1m
Broadcasting station	12	Ch. maintenance	Apprentice	Elect. power station	18m	E.Tr.SS	1m
Broadcasting station	12	Ch. electrician	Apprentice	German factory	12m	--	1m
Broadcasting station	12	Recording operator	Trainee	Broadcasting station	1m	2m UNRWA	1m

Railways	6	Fitter	Apprentice	Mechanic Workshop	24m	--	3m
Railways	7	Welder	Apprentice	Army Workshop	18m	--	1m
Public works	7	Mechanic	Apprentice	Army Workshop	12m	E.Tr.SS	1w
Public works	6	Mechanic	Apprentice	Public works Workshop	12m	--	1w
Cement factory	6	Mechanic	Apprentice	Mechanic Workshop	12m	--	1m
Cement factory	6	Welder	Apprentice	Blacksmith Workshop	12m	--	2m
Civil Aviation	3	Power generator operator	Apprentice	Public works Workshop	36m	--	4m
Civil Aviation	4	Mechanic	Apprentice	Car repair Workshop	13m	--	5m
Steel factory	3	Ch. maintenance section	Apprentice	Blacksmith Workshop	18m	4m or Eg	3m
Steel factory	9	Mechanic maintenance	Apprentice	Cement factory	24m	--	3m

Source: Interview of 22 work-companions of employed graduates.

in relation to the graduates as rated according to their utilization of the curriculum components.

Of the 15 companions to the graduates in the closely related or broadly related categories (those utilizing two to four curriculum components), 9 have elementary education while 6 have some secondary education (Table 7-2). Of the 7 companions to the unrelated category of graduates (those utilizing only the general theory component), 6 have some secondary education while one has only elementary education (Table 7-2).

Table 7-2

Work-companions According to Educational Backgrounds

Category	Some Elementary Education	Some Secondary Education	Total
Companions to the closely and broadly related category of graduates	9	6	15
Companions to the unrelated category of graduates	1	6	7
Total	10	12	22

Source: Interview of work-companions as summarized in Table 7-1.

Although the above mentioned findings must be generalized with caution, the data suggest that:

1. Persons who have only some elementary education can be trained for those jobs to which the school curriculum is closely or broadly related by in-employment training. Examples of such jobs are trades that can be learned in small workshops, such as mechanics, electrical work, plumbing, welding, fitting, etc.

2. Persons who have some secondary education can be trained by in-employment training for those jobs to which the industrial school curriculum is unrelated. Examples of such jobs are those relevant only to the employing establishments in question, such as refinery units operatives, broadcasting station recording section operatives, laboratory assistant analysts, etc. The available data suggest to the researcher that such jobs require a higher educational level than the traditional trades mentioned above in (1). Thus the secondary education of these companions enabled them to participate with the graduates in the in-employment training activities.

These two observations could be considered as hypotheses subject to further verification, particularly for wider generalization.

The Method and Time Needed to Acquire Skills

1. Most of the work-companions of the graduates who are either of the closely or broadly related category have only an elementary education and learned their trades (electrical work, mechanics, fitting, welding, etc.) in privately owned workshops.

It took them from 12 to 36 months to learn their trades in the workshops (see Table 7-1).

2. The work-companions of the unrelated category of graduates attended the same formal training programs that the graduates attended. Thus the time required for training both groups was equal. Of the seven interviewed work-companions of graduates in the unrelated category, six have some secondary education.

Work-companions and Additional Out-of-the-Establishment Training

Three of the companions have been attending the evening training program organized in the Amman secondary industrial school. All the other work-companions stated that they had not heard of this program; they said that if they had known of it they would have participated in it. The participating companions stated that they got from the evening training program the things they had been lacking, namely, a genuine theoretical technical foundation and a diploma.

CHAPTER VIII

WORKERS IN ESTABLISHMENTS NOT EMPLOYING GRADUATES

Aims

Chapter I revealed that 96% of the graduates of the secondary industrial schools are employed in the public and mixed industrial sectors of Jordan. The private sector employs the remaining 4% (Table 1-3). Chapter IV suggests that the private sector may have its own recruitment and training policies which only in rare cases include hiring of graduates of the industrial schools. It was also suggested that the graduate himself does not apply for work in the private sector, but limits his job hunting efforts to the public and mixed sectors.

The researcher hypothesized that the elementary and secondary general schools are supplying the private sector with most of the middle-level recruits. Data were gathered to test this hypothesis. More specifically, the aim was to compare the graduates of the secondary industrial schools and the workers in establishments not employing graduates. Workers in both groups are doing similar jobs. The comparison focuses on the educational backgrounds of the non-industrial school workers in terms of number of years spent in school, the job currently performed, the method of training by which they got their current skills, and the period required for

this training. A further aim is to know the opinions of the employers as to the qualifications they require when recruiting persons to the operation and maintenance sections of their establishments.

Methodology

The establishments selected for investigation and analysis are representative of the modern and quasi-modern private industries in Jordan. Nine private industrial establishments employing from 50 to 250 skilled and semi-skilled workers were selected and one establishment, the cigarette factory, which employs 500 workers (Table 8-1).

The researcher interviewed several workers in each of the ten establishments (Table 1-9). The interviewed workers were randomly selected from among the total number of workers in each establishment who were judged to be doing middle-level tasks--that is, tasks similar to those graduates do in the public and mixed sectors. Twenty-four of the interviewees are the same ages as the interviewed graduates and have equal years of schooling. The types of secondary schools attended by the two groups differ; the graduates attended industrial schools and the interviewees of this section attended general schools. For the purposes of this analysis, interviewees with eleven and twelve years of secondary education are grouped in one category (Table 8-3). This number totals 24 workers. The analysis focuses on this group because of the comparative information it provides.

Table 8-1

Educational Background of Skilled and Semi-Skilled Workers of the Ten Selected Establishments

Category	Illiterate 0	Elementary 1-6	Preparatory 7-9	General Secondary 10-12	Higher 13-16	Total
1. Tanker construction	20	15	3	2	--	45
2. Foundry	15	30	10	3	--	58
3. Phosphate mine	10	100	55	13	5	183
4. Tannery	13	52	15	15	4	95
5. Printing press	--	20	25	5	--	50
6. Cigarette factory	250	230	15	5	--	500
7. Pharmaceutical	--	15	20	20	9	65
8. Wet Batteries	50	75	25	25	--	250
9. Dry Batteries	3	50	30	19	1	103
10. Industrial Complex	12	55	24	7	2	100
Total	374	667	273	104	19	1437
Percentage	26%	46.4%	18.8%	7.2%	1%	

Source: Interviews with employers of the establishments.

Employers, supervisors, recruitment personnel, training officers, and foremen were also interviewed and consulted in each establishment concerning the recruitment and training policies of their establishments.

Main Findings

Table 8-1 reveals the educational background of the total labor force of the ten selected establishments. The main findings of the interviews with the workers are in Table 8-2.

The educational background of the skilled and semi-skilled labor force of the ten visited establishments is varied, ranging from illiteracy (26%) through the ability to read and write, to university education. The majority of the workers have some elementary education; 26% of them have some secondary education. It should be noted that, while none of the 194 located graduates of the industrial schools employed in Jordan is in any of these establishments (see Table 1-3), the phosphate mining company does have three graduates of Amman industrial school who graduated before 1963/64. Also, the company has four workers from the UNRWA training centers.

The sample of workers selected for the interviews also contains varied educational backgrounds. However, 76.2% of them have secondary education, ranging from seven to twelve years of schooling. The workers who have eleven to twelve years of general education and who are the focus of the analysis in this section constitute 40% of the total number of interviewed workers (Table 8-3).

Table 8-2

Summary of Data Provided by the Interview of Workers in the Ten Establishments

Establishment and Job	Father's Occupation	Years of Education	Starting Wage	How Skills Acquired	Place of Training	Period of Training
(1) Tankers						
1. Foreman B.S.	Driver	11	4	Apprentice	The same est.	2 yrs.
2. Master fitter	Blacksmith	11	8	Apprentice	Other est.	1 yr.
3. Asst. fitter	Daily worker	5	8	Apprentice	The same est.	1 yr.
4. Blacksmith	Carpenter	7	10	Apprentice	The same est.	2 yrs.
5. Welder	Mason	7	10	Apprentice	The same est.	6 mos.
6. Foreman welder	Blacksmith	11	15	Apprentice	The same est.	1 yr.
(2) Foundry						
1. Accountant	Clerk	12	20	Trainee	Private inst.	6 mos.
2. Turner	Daily worker	7	9	Apprentice	The same est.	7 mos.
3. Fitter	Daily worker	7	15	Student	UNRWA	6 mos.
4. Welder	Blacksmith	9	10	Apprentice	Other workshop	1 yr.
5. Foreman	Daily worker	6	6	Apprentice	Other workshop	1 yr.
6. Foundryman	Mason	5	6	Apprentice	The same est.	6 mos.
(3) Phosphate						
1. Chemical analyst	Daily worker	12	14	Trainee	The same est.	1 yr.
2. Electrician	Soldier	7	15	Apprentice	Other workshop	18 mos.
3. Batteries repair	Farmer	12	13	Trainee	The same est.	1 wk.
4. Electrician	Farmer	9	9	Apprentice	The same est.	9 mos.

5. Welder B.S.	Grocer	10	17	Trainee	UNRWA	2 yrs.
6. Plumber	Plumber	7	15	Trainee	UNRWA	1 yr.
7. Fitter	Soldier	9	8	Apprentice	The same est.	1 yr.
8. Lab. analyst	Daily worker	12	10	Trainee	The same est.	1 yr.
(4) Tannery						
1. Chief Lab.	Grocer	11	10	Trainee	The same est.	18 mos.
2. Asst. foreman	Farmer	12	15	Trainee	Foreign train.	3 mos.
3. Quality control	Soldier	12	15	Trainee	Foreign train.	6 mos.
4. Treatment leather	Daily worker	9	15	Apprentice	Family trade	3 yrs.
5. Electrician	Grocer	9	10	Apprentice	Army workshops	2 yrs.
(5) Printing Press						
1.	Mason	10	8	Apprentice	Other printing	6 mos.
2.	Daily worker	7	8	Apprentice	Other printing	6 mos.
3. Foreman machinist	Farmer	6	8	Apprentice	The same est.	3 yrs.
4. Bookbinder	Carpenter	6	5	Apprentice	Other printing	1 yr.
5. Machine operator	Carpenter	9	10	Apprentice	Other printing	1 yr.
6. Director	Mason	6	7	Apprentice	Other printing	3 yrs.
(6) Cigarette factory						
1. Chief mechanic	Daily worker	6	10	Apprentice	Workshops	2 yrs.
2. Asst. mechanic	Blacksmith	7	15	Apprentice	Workshops	2 yrs.
3. Supervisor	Daily worker	9	10	Trainee	The same est.	1 yr.
4. Assistant	Clerk soldier	12	10	Trainee	The same est.	2 wks.
(7) Pharmaceutical						
1. Asst. analyst	Farmer	12	18	Trainee	The same est.	3 mos.
2. Analyst	Carpenter	12	18	Trainee	Foreign train.	5 mos.
3. Product control	Farmer	12	15	Trainee	Foreign train.	6 mos.

Table 8-2--Continued

Establishment and Job	Father's Occupation	Years of Education	Starting Wage	How Skills Acquired	Place of Training	Period of Training
(8) Wet Batteries						
1. Asst. Administr.	Daily worker	6	6	Trainee	Foreign expert	2 yrs.
2. Acid formation	Farmer	10	9	Trainee	The same est.	6 mos.
3. Storekeeper	Mechanic	12	9	Trainee	The same est.	6 mos.
4. Welder	Civil servant	12	8	Trainee	The same est.	1 mo.
5. Welder	Daily worker	6	8	Trainee	The same est.	3 mos.
6. Welding foreman	Mechanic	6	5	Trainee	The same est.	1 mo.
7. Welder	Daily worker	2	9	Apprentice	The same est.	1 mo.
8. General foreman	Soldier	5	6	Apprentice	Many workshops	2 yrs.
(9) Dry Batteries						
1. Welder	Daily worker	11	12	Trainee	Army workshops	1 yr.
2. Welder	Blacksmith	12	10	Trainee	The same est.	1 mo.
3. Chemical mixing	Driver	7	9	Trainee	The same est.	1 wk.
4. Administration	Farmer	9	15	Trainee	The same est.	1 mo.
5. Technical asst.	Daily worker	9	10	Trainee	Workshops	6 mos.
6. Storekeeper	Driver	12	15	Trainee	The same est.	6 mos.
(10) Industrial Complex: Cosmetics, Biscuits, Ice cream, Paints						
1. Ice cream foreman	Business man	6		Family trade		1 yr.
2. Cosmetics foreman	Business man	12		Family trade		1 yr.
3. Biscuits foreman	Farmer	12	18	Trainee	Italian expert	1 yr.
4. Chemical analyst	Farmer	12	18	Trainee	The same est.	3 mos.
5. Paint mixer	Daily worker	11	14	Trainee	English expert	9 mos.
6. Chemical analyst	Headmaster	12	14	Trainee	The same est.	4 mos.

Source: Interview of 58 workers employed in establishments not employing graduates of Secondary schools.

Table 8-3

Educational Backgrounds of the Interviewed Workers

School Years	No. of Workers	%
1-4	2	3.3
5-6	12	20.5
7-8	10	17.2
9-10	10	17.2
11-12	24	41.8
Total	58	100.0

Source: Interview of workers as summarized in Table 8-2.

Most of the 24 interviewed workers in this category (having eleven to twelve years of general education) have fathers who are or have been in the industrial labor force or other non-agricultural occupations (Table 8-4). Only six workers come from families that depend on agriculture for their main source of income. In contrast to these, 41.6% of the fathers of the industrial school graduates are farmers (Table 3-4) and 58.3% are of rural origins (page 58). Thus it could be said that the general vocational pattern of most of the workers from the general schools is similar to that of their fathers. The vocational pattern of the industrial school graduates, however, often represents a shift from that of their fathers--a shift from rural farming to urban industrial.

Table 8-4

Occupations of the Interviewees' Fathers

Category	No.	%
Mechanic	1	4.1
Blacksmith	3	12.6
Grocer	1	4.1
Soldier	2	8.3
Business man	1	4.1
Manual worker	5	20.9
Farmer	6	25.1
Civil servant	3	12.6
Driver	1	4.1
Total	24	100.0

Source: Interview of workers.

With the exception of the electrician and the fitter, all the other workers are doing specific tasks that are related to the needs of the establishment in question. Even the welders who are working in the dry and wet batteries establishments were trained in the place of their employment. Their general secondary education, the interviewees and the employers stated, accounted for their ability to learn their jobs quickly by undergoing a short training program. Those who are working in the laboratory units of several establishments stated that their chemistry, science, and mathematics courses accounted for their ability to acquire the required specific skills. Those who are working as accountants and

storekeepers stated that their mathematics and language courses helped them in acquiring the new skills, though some of them also attended courses in private institutes. The three foremen are responsible for tasks that are family trades.

The 24 workers from the secondary general schools have brought with them into the employing establishment the entire school curriculum, which is only one component, the general theory component. They learned the other three components--the specific skills, the general skills, and the specific theory--in the employing establishment. These workers are doing tasks similar to those done by the graduates of the secondary industrial schools in their employing establishments. However, a basic difference between the two groups is that the general school graduates utilize all of their curriculum, while the industrial school graduates utilize only part of their curriculum.

In most cases the time needed for training ranged from one month to six months, while a few workers required more than six months (Table 8-2). For many of them the foreign experts who helped in the initial take-off stage of the establishment were the training officers. Training for others was provided by local people ranging in educational backgrounds from university graduates (for tasks requiring chemistry) to those with little education in the case of other tasks.

The case of workers with less than eleven years of schooling is different from those studied above. It may be observed

(Table 8-2) that the lower the educational level, the more likely it is that the workers are doing jobs that require longer periods of training. Generally they are employed in the maintenance and repair sections of the establishments. For this category of skilled workers, the small workshop is always the first training place (Table 8-2). They started as apprentices when they were comparatively young. For 20 of the 34, the period of apprenticeship was one to three years. These findings on workers with lower educational background support the findings on work-companions of the graduates (Chapter VII). In the case of the work-companions, it was found that those with elementary education were doing jobs in the repair and maintenance sections of the establishments, and that they had acquired their skills in workshops.

Recruitment and Training Policies

There was a consensus among the recruiting officers and supervisors of the ten establishments concerning the main policy guidelines in their establishments:

1. There are specific skills that are relevant only to the establishment in question. These skills are more commonly utilized in the production section. For example, the researcher visited two factories that manufacture batteries, one dry batteries and the other wet batteries. Supervisors stated that the specific skills needed for wet batteries are not the same as those needed for dry batteries. If a worker changes his place of work from one to the

other, he needs retraining. In other words, no industrial school program could possibly accommodate the multitude of specific skills needed by all the industrial establishments.

For this category of jobs, the supervisors and the recruitment personnel stated, the recent trend in newly established factories is to give preference to persons who have some education at the post-elementary level. The reason, they said, is that such persons are more readily trainable. Such new recruits will be trained in the establishment itself.

2. There are some specific skills that require a good background in a field of science. The researcher found a laboratory unit in seven of the ten visited establishments. Such units need specialized specific skills. The chief laboratory technician is usually a university graduate, but the middle-level laboratory positions, the researcher found, were held by young persons who are graduates of the scientific sections of the general secondary schools. Such recruits have good achievement records in high school chemistry. They are trained for a few months in the laboratory, after which they become the backbone of the unit. The training takes place in actual work situations in which the new worker learns initially through observation and then through practice under the guidance of a senior co-worker.

3. For the repair and maintenance section, an already-trained applicant is preferred. In no case would this new applicant

be a fresh graduate of the secondary industrial schools. Recruits who have had many years of experience and who have more than one type of skill, for example mechanical and electrical skills and occasionally chemical skills, are preferred. Most already-trained workers employed by these establishments got their skills in small workshops. Sometimes a worker from within the establishment is promoted to fill a vacant post.

CHAPTER IX

BENEFIT/COST ANALYSIS

The two existing alternatives of meeting middle-level manpower requirements with equal years of schooling are the secondary industrial school and the secondary general school. The findings of this research indicate that the graduates of the two types of schools may be found performing similar or related jobs after undergoing (the same) formal or informal training in the employing establishments.

To decide which of the alternatives is more profitable and to what extent, a benefit/cost analysis is applied to these alternatives.

The technique of discounting costs and returns is employed. The streams of returns and the streams of costs for each of the investments are discounted to their present value. If the discounted net returns of the two alternatives outweigh the discounted costs, then--so far as the measured characteristics taken into account in the cost/benefit analysis are concerned--the alternative whose returns outweigh costs by the largest amount should be chosen for action. The intangible benefits that might accrue to the individual or society should also be taken into consideration.

It is assumed that three years of regular secondary industrial or secondary general education and graduation, and any

additional training in the employment system, bring a certain stream of returns in the form of income over and above what is earned by the person whose education is terminated at the end of the ninth grade. If the streams of net returns are discounted back and compared with the discounted costs, a given ratio of benefits to costs is obtained.

The benefit/cost ratio analysis has been used in several case studies.[1] The method of analysis is conveniently described by Davie.[2]

Costs of Secondary Industrial Schools

Public Costs

The secondary industrial and the secondary general schools are costed and compared on the basis of the annual per pupil cost. Estimates are later made of how the comparison is affected by data on cost per-successful trainee or graduate.[3]

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[1]See Nat[illegible]niel H. Leff, "The Brazilian Capital Goods Industry, A Case Study in Industrial Development" (unpublished doctoral dissertation, MIT, 1966) (being published by Harvard University Press, 1968), p. 110; and A. J. Corazzini, Vocational Education, A Study of Benefits and Costs: A Case Study of Worcester, Mass. (Princeton University: 1966).

[2]Bruce F. Davie, "Using Benefit-cost Analysis in Planning and Evaluating Vocational Education," a paper prepared for David S. Bushnell, Director, Division of Adult and Vocational Research, Bureau of Research, U. S. Office of Education, 1965. (Mimeographed.)

[3]The importance of such calculations is stressed in United Nations Economic and Social Council, Training of National Technical Personnel for Accelerated Industrialization of Developing Countries, E/3901/Add.1, 3 June 1964, p. 125.

In the current annual budget of the Ministry of Education, there is an allocation for industrial education expenses for the year 1965/66 of 138,100 JDs (see Table 9-1). For the same year there are 716 students enrolled in the four secondary industrial schools. Thus the public per-pupil cost of current expenditure is 192.2 JDs.*

Table 9-1

Current Budget of the Ministry of Education
1965/66

Category	Allocations in JDs	%
General Administrative Expenses	294,030	6.7
Elementary and Secondary Education	3,531,115	81.0
Teachers' colleges	179,700	4.1
Industrial Education	138,100	3.2
Agricultural Education	115,335	2.6
Scholarships	58,200	1.3
Repair and Maintenance Workshop	2,245	0.1
Educational Activities	42,950	1.0
Total	4,361,765	100.0

Source: Ministry of Education Yearbook, 1965/66.

Secondary industrial schools are separate educational institutions from the general schools. Data on capital costs for each of the four industrial schools are available (expressed

*One Jordanian dinar is equivalent to $2.7.

in US dollars).[4] Three of the four schools have no boarding sections; half of the students of Amman school are boarders. Which school to select for estimating costs posed a problem for the researcher. There are variations in costs.[5] The capital costs of the Nablus school, the lowest of the four schools, are utilized for calculating the per-pupil capital cost (see Table 9-2).

Table 9-2

Capital Costs of Nablus Secondary Industrial School

Category	In US Dollars
1. Plans, supervision of construction	11,600
2. Buildings	112,560
3. Additional local constructural services	28,000
4. Electrical power supply to school site	2,800
5. Equipment	84,400
6. 12-1/4 acres of land in Nablus	56,000
Total	$295,360

Source: Vocational Education Report, Ministry of Education, 1962.

[4]Ministry of Education--A.I.D./J., The Vocational Education Program in the Hashemite Kingdom of Jordan, 1962: a Survey Report (Amman: Ministry of Education, 1962), p. 110.

[5]The Irbid school is twice as expensive as the Nablus. The costs of the Jerusalem and the Amman schools are in between these two. This fact should be kept in mind when the final benefit/cost ratios for the industrial and general schools are compared. See ibid., pp. 91, 110.

The researcher used the standard method of calculating capital outlays.[6] Capital outlays include: (1) depreciation for building and equipment, (2) interest on capital, which includes values of land, building, and equipment (3) property tax exemption. The interest rate used is 5%. The rate of depreciation for buildings is 2% and for equipment, 10%. The value of annual property tax exemption is 23% of the value of annual rent. After the necessary calculations are made, the per-pupil annual capital cost is 50 JDs (see Table 9-3).

Table 9-3

Annual Per-Pupil Capital Cost in Secondary Industrial School

Category	Per-Pupil Cost in US Dollars
Interest (of total value of land, equipment and building at 5%)	66
Depreciation:	
Building (2%)	14
Equipment (10%)	38
Property tax exemption (23% of the value of annual rent)	16
Total	US $134 = JDs 50

Source: Calculated from Table 9-2.

[6] Rudolph C. Blitz, "The Nation's Educational Outlay," in Economics of Higher Education, edited by Selma J. Mushkin (Washington: U. S. Office of Education, 1962), p. 147.

Thus the annual per-pupil public costs, which includes the per-pupil current public expenditure of the value of 192 JDs and the per-pupil public capital cost of the value of 50 JDs, is 242 JDs.

Private Costs

Private costs refer to two items. The first is pocket expenses. This is what the student pays out of pocket for incidental and regular purchases of goods and services not provided by the school. From interviews with principals and students, it is estimated that a student spends seven dinars annually for pocket expenses.

The second is opportunity costs. These are the indirect private costs. The student who finishes the ninth grade and chooses to continue his education foregoes the income which he could have earned had he chosen to terminate his education and become employed--assuming, of course, that he finds work. The income foregone is included as a cost component in the three years of education and training in the industrial and general schools.[7] Results of interviews in ten establishments showed that a person with nine years of education earns about 11-13 JDs per month as a starting wage. For the purposes of the research 12 JDs is taken as the average starting earnings. The annual income of 144 JDs is

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[7] T. W. Schultz, "Investment in Human Capital," Am. Ed. Rev. (March, 1961), pp. 1-17; and T. W. Schultz, The Economic Value of Education (New York: Columbia University Press, 1963), p. 27.

taken as the annual opportunity cost of the industrial and general schools.

Total Annual Public and Private Per-Pupil Cost

The total annual per-pupil cost, which includes the public and private costs, is 393 JDs (see Table 9-4). If opportunity costs are excluded, the per-pupil cost becomes 249 JDs. (See Table 9-4.)

Table 9-4

Summary of Total Annual Public and Private Per-Pupil Cost in a Secondary Industrial School

Category	Per-Pupil Cost in JDs
1. Public costs:	
(1) Current expenditure[a]	192
(2) Capital costs[b]	50
2. Private costs:	
(1) Direct private costs (pocket expenses)[c]	7
(2) Indirect private costs (opportunity costs)[c]	144
Total	393

Sources: [a]Table 9-1
[b]Table 9-3
[c]Independent field survey

Present Value of Per-Pupil Cost in Three Years

The calculation of the present value of the per-pupil public and private costs is based on the following formula (see Leff, p. 111):

$$Q = \sum_{t=1}^{3} (C_t + Y_t)\,(1 + i)^{-t+1}$$

where Q = the present value of per-pupil cost in three years in the secondary industrial school; Y = the foregone earnings of a ninth grader who joins the secondary school rather than start work; C = the annual public and private direct costs per student; i = the rate used to discount to present value the future costs; t = number of years, the first year of secondary school counted as year 1.

Using the above formula we get the present value of per-pupil costs in three years,

Year	C_t	Y_t	$C_t + Y_t$	Discounted Value of Q at 5%
1	249	144	393	393
2	249	144	393	374
3	249	144	393	356
			Total	1123 JDs

The following results can be stated:

1. The present value of the total per-pupil cost, public and private, for the three years required in the industrial school is 1123 JDs.

2. The present value of the per-pupil cost, calculated without opportunity cost, is 712 JDs.

Cost of Secondary General Schools

Table 9-1 of the current fiscal budget of the Ministry of Education shows that 3,531,115 JDs were allocated for elementary and secondary general schools. The two levels of education have different per-pupil costs. Based upon teacher-pupil ratios and salary ratios in the elementary and secondary schools, the researcher estimates the per-pupil current cost ratio of the two levels as 1:1-1/3. Considering the number of elementary and secondary school pupils, the per-pupil cost at the secondary level is estimated at 16.5 JDs per annum.

The researcher could not get reliable data on the cost of school construction. Hence the capital outlays are estimated. The Jordan Industrial Development Bank gives an estimate of 100 JDs as the rent of one room per annum, which can be considered the rent of a classroom per annum. The pupil/room ratio is 43 pupils per room.[8] Thus, the rent per pupil in the secondary general school may be estimated at 2.4 JDs per annum.

The private costs, both the direct out-of-pocket expenses and the indirect opportunity cost, are the same as those for the student in the secondary industrial school, 7 JDs and 144 JDs per

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[8] Ministry of Education, Annual Report, 1965/66 (Amman: Ministry of Education, 1966), p. 189.

annum respectively. Thus the total annual per-pupil cost, including private and public costs, is 170 JDs (see Table 9-5).

Table 9-5

Total Annual Public and Private Per-Pupil Cost in a Secondary General School

Category	Per-Pupil Cost in JDs
1. Public costs:	
(1) Current expenditure	16.5
(2) Capital costs	2.4
2. Private costs:	
(1) Direct private cost	7.0
(2) Indirect private costs (opportunity costs)	144.0
Total	170.0

Using the formula on page 152, we can calculate the present value of per-pupil costs in the three years of the secondary general school.

Year	C_t	Y_t	$C_t + Y_t$	Discounted value of cost at 5%
1	26	144	170	170
2	26	144	170	162
3	26	144	170	154
			Total	486 JDs

The present value of total per-pupil cost in three years is 486 JDs. The per-pupil cost calculated without opportunity cost is 75 JDs.

Costs of Training in the Employment System

In addition to the cost of education and training in the industrial school, the cost of training that a graduate gets in the employing establishment should be considered. It is difficult to assess the costs of training in the employment system. Most of the in-employment training in Jordan is of the informal on-the-job training type. Exceptions are in the refinery and, to a lesser extent, in the Ministry of Communications. Based on information acquired from refinery records and interviews with training officers and employed graduates, it is estimated that the refinery incurs 142 JDs per trainee, which includes the salaries of instructors and trainees. The opportunity cost is estimated at 126 JDs for the period of six months of training. This makes the total cost of training at the refinery--discounted 3.5 years back--231 JDs with opportunity cost and 123 JDs without opportunity cost.

Cost of Training in the Secondary Schools and in the Employing Establishment Combined

The Industrial School

The present value of per-pupil cost of training in three years in the industrial school and six months in the employing establishments is 1354 JDs with opportunity cost and 835 JDs without opportunity cost (Table 9-6).

Table 9-6

Present Value of Per-Pupil Cost of Education and Training in the Industrial School and the Employing Establishment Combined, in JDs

Category	With Opportunity Cost	Without Opportunity Cost
Industrial school	1123	712
Employing establishment	231	123
Total	1354	835

The General School

The present value of training a secondary general school graduate in the employing establishment is the same as that of the industrial school graduate, provided both are work-companions. Thus, the discounted present value of per-pupil education of the secondary general school plus his training in the employing

establishment is 717 JDs with opportunity cost and 198 JDs without opportunity cost (Table 9-7).

Table 9-7

Present Value of Per-Pupil Cost of Education and Training in the General School and the Employing Establishment Combined, in JDs

Category	With Opportunity Cost	Without Opportunity Cost
General school	486	75
Employing Establishment	231	123
Total	717	198

Costs Per-successful Graduate

The per-successful graduate or trainee cost refers to the student who successfully finishes the final year of schooling with a diploma. Principals interviewed stated that the secondary industrial school has a low rate of drop-outs, not more than 5%. Thus the per-pupil cost may be considered equal to the per-successful graduate cost for the industrial school. On the other hand, only 50% of the students joining the tenth grade of the secondary general school get the Secondary Education Examination Diploma.[9] Thus the

[9]Ministry of Education, Jordan, Yearbook, 1966 (Amman: Ministry of Education Publications, 1966), p. 199.

per-pupil cost of the general secondary school is adjusted to represent the per-successful graduate cost by multiplying it by 2.

Comparison of Costs

Two charts are presented. Chart one represents the cost ratio of the industrial school graduate to the general school graduate on the basis of per-pupil cost. Chart two utilizes the concept of the per-successful graduate cost, and the comparisons between the graduates of the two schools are made accordingly. Both charts are given without opportunity costs.

Benefits

The cost of educating and training a student to become a skilled worker consists of private and public costs; the benefits are also both public (social) and private. The availability of reasonably adequate cost data made it possible to estimate the private and public costs. Some social and private benefits are not tangible and thus not measurable.

It has been pointed out that 9.4% of the graduates of the industrial schools work abroad (Table 1-2). Graduates are attracted to work abroad because they get higher earnings than at home. Just how much higher could not be determined. The higher earnings can be considered a private benefit over and above what the graduates earn in Jordan. Part of the additional income

Chart 1

Comparative Costs of General and Industrial School Graduates on the Basis of Per-pupil Costs, in JDs

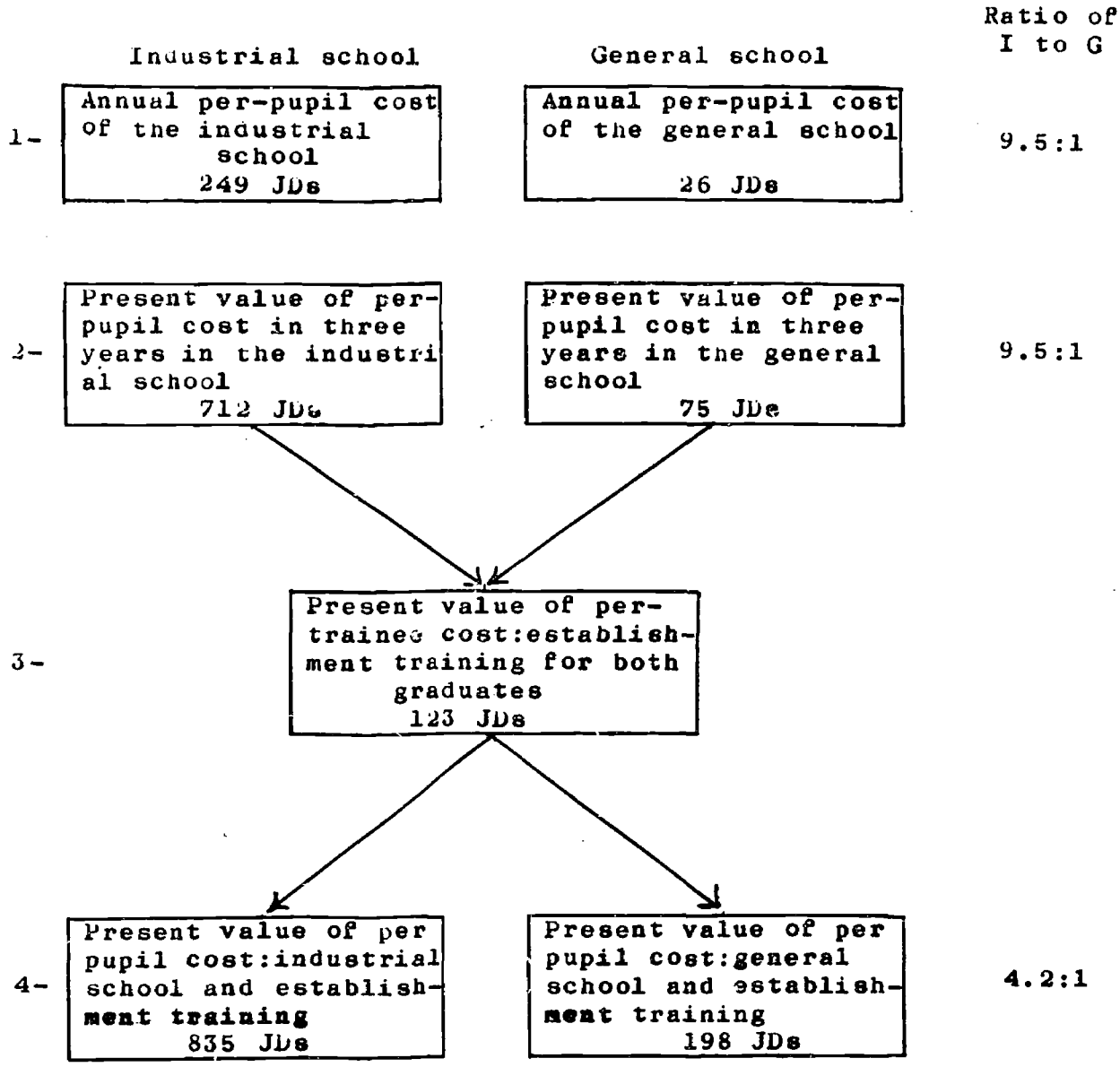
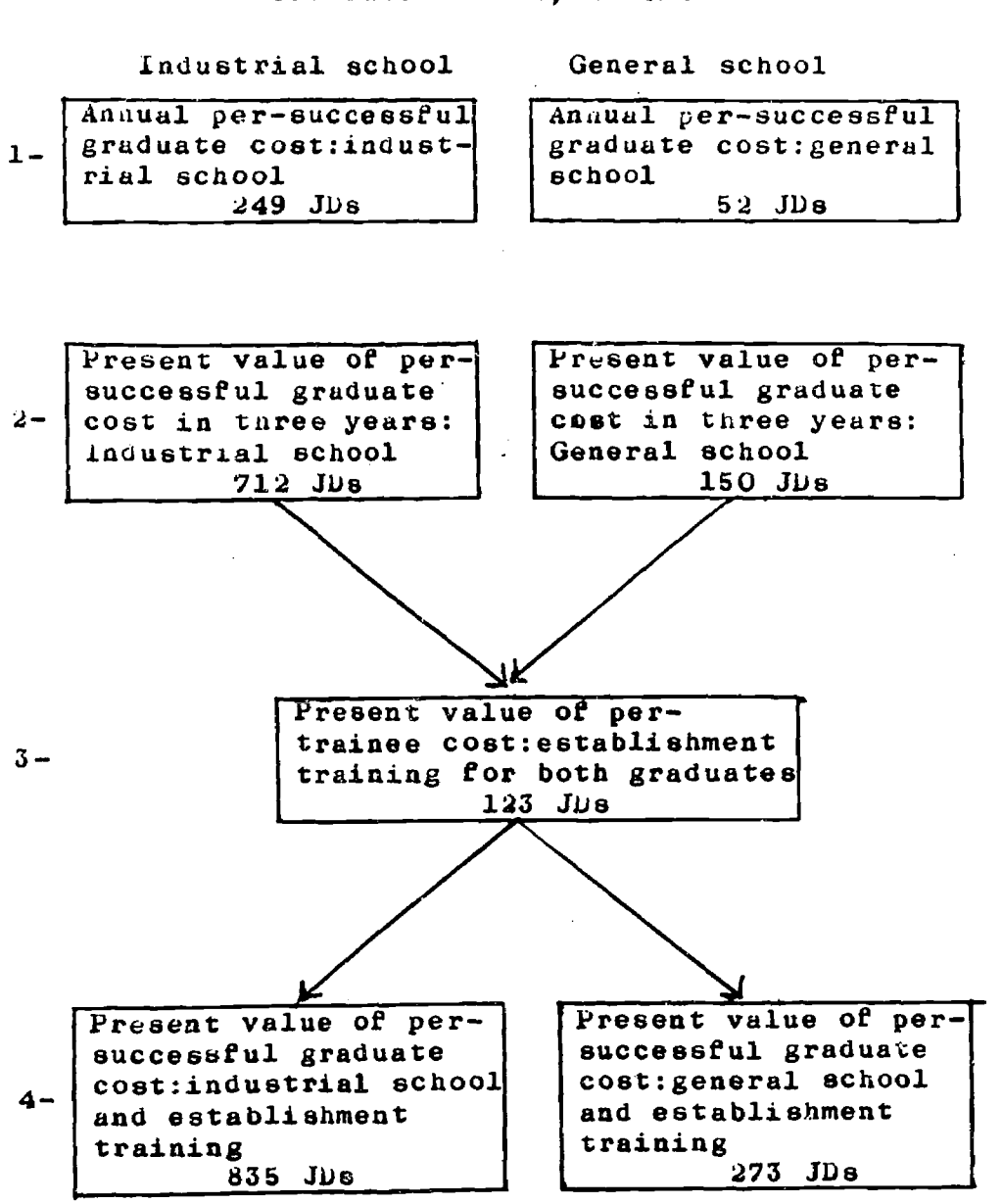


Chart 2

Comparative Cost of General and Industrial School Graduates on the Basis of Per-successful Graduate Costs, in JDs



might be sent back to Jordan to be shared with families and may thus be considered a social benefit in the form of additional taxes.

Industrial schools might be considered a help in reducing the number of unemployed general school graduates. This form of intangible social benefit can not be estimated very highly at present, since the number of industrial school graduates is too small to make much difference in the employment situation one way or another. Also, it should be recalled that secondary industrial schools in Jordan are neither for potential drop-outs nor for students with a low level of academic achievement. Although they come mainly from families with comparatively low incomes, the industrial school students have high academic achievement levels. The industrial schools, therefore, cannot claim credit for social benefits resulting from lowering the level of drop-outs and thus reducing the costs of combatting crime and juvenile delinquency, as may be the case in other countries.[10]

Benefit/Cost Ratio

Data concerning lifetime earnings of industrial or general school graduates are not available. Only initial salaries can be determined. According to the findings of the present research, both kinds of graduates usually get the same initial earnings when

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[10] A. J. Corazzini, Vocational Education, A Survey of Benefits: A Case Study of Worcester, Mass. (Princeton: Industrial Relations Section, 1966), p. 83.

they are employed in the same establishment (Table 9-8), and this is the situation prescribed by the Civil Service Law.[11]

Table 9-8

Initial Monthly Salaries of Secondary Industrial School Graduates and Their Work-companions of Twelve Years of Schooling in JDs

Establishment	Initial Salary
Ministry of Communications	18
Ministry of Public Works	18
Ministry of Education	23
Ministry of Finance	18
Broadcasting Station	18
Railways	21
Civil Aviation	22
Natural Resources Department	20
Police Force	22
Central Bank	25
Electricity Power Stations	18
Iron & Steel Factory	23
Cement Factory	20
Refinery	22
Average	21

Source: Interview of graduates and records of employing establishments.

Given this situation in which cost data are available but not data by which to estimate lifetime earnings, the method of Davie[12] will be followed to determine the future additional income

[11] Civil Service Commission, Civil Service Law, 1966 (Amman: Civil Service Commission Department Publications, 1966), Article 23.

[12] Davie, op. cit., p. 10.

which would have to be earned by the graduate, over and above what the ninth grader earns, in order to cover the costs of training in the school and the employing establishment. Costs will be covered by additional benefits within an assumed period of time using an "arbitrarily selected benefit/cost ratio." The approach is summarized by Davie: "What does the amount of benefits in terms of additional future income of students trained in the program have to be, given the costs of the program [underlining mine] so that the ratio of benefits to costs would at least equal the pre-determined level? The derived amount of benefit can be expressed in terms of the average annual additional earnings per student."[13]

For the benefits of the training program in the industrial school and in the employing establishment, combined, to be just equal to the costs (835 JDs without opportunity cost, Table 9-6), the graduate would have to earn additional future income which has a present value of 835 JDs. Let us take the period of twenty years as the length of time over which students could be expected to cover the costs of their schooling. Then the amount of 835 JDs (which is the per-pupil cost of three years in the industrial school plus training in the employing establishment) can be converted into average annual amount of additional future income by dividing by a factor equal to the present value of an annuity of one JD per year for twenty years (12.46) at a 5% interest rate.[14] Thus, the

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[13] Ibid., p. 10.

[14] Ibid., p. 11.

average annual amount of additional future income for twenty years should be 67 JDs, on the assumption of a 1:1 benefit/cost ratio and a 5% interest rate. If the ratio is to be 2:1, the average annual amount of additional benefits should be 134 JDs. If the ratio is to be 3:1, the average annual amount of additional benefits should be 201 JDs. In other words, for the training of the industrial graduate to be justified in these benefit/cost terms, he should earn 201 JDs over and above what the ninth grader earns annually (assuming 20 years of work, a 5% interest rate, and a 3:1 benefit/cost ratio).

It was estimated that both the industrial and the general school graduates earn initial salaries equal to 21 JDs monthly, or 252 JDs annually (Table 9-8). It was also estimated that the initial monthly salary of a ninth grader is 12 JDs or 144 JDs annually. Taking only the first year salary into consideration, both graduates earn an additional annual income over and above what the ninth grader earns by 108 JDs. Assuming that this actual additional income for the initial year (108 JDs) persists for 20 years, the amount is sufficient to cover what the industrial graduate should earn only if the benefit/cost ratio is 1:1. It falls short of the 2:1 benefit/cost ratio by 26 JDs (134 - 108 = 26) and falls short of the 3:1 benefit/cost ratio by 93 JDs (201 - 108 = 93). In other words, taking initial salaries only into consideration, the costs of training the industrial school graduate can not be covered if the benefit/cost ratio is 2:1 or more and the interest rate 5%.

The situation is different for the general school graduates. The actual additional income for the initial year (108 JDs) is in excess of what should be earned for the three assumed ratios. In fact, when the assumptions made above are used with the per-pupil costs for the general school graduates, general school graduates will have a benefit/cost ratio of 6.7:1 (108/16).

Based on initial actual additional earnings and the other assumptions stated, the benefit/cost ratio of the industrial school graduate is 1.6:1. Note that the benefit/cost ratio of the general school graduate is 6.7:1, while the ratio for the industrial graduate, who is his work-companion, is 1.6:1.

If the estimates are made on the basis of a per-successful graduate cost, the benefit/cost ratio of the general school graduate becomes 5:1 (108/22). The benefit/cost ratio for the industrial school graduate remains the same, that is, the 1.6:1 (108/67).

What would be the effect of using a different interest rate for discounting the future streams of income to present values? It might be argued quite convincingly that in a capital-poor country like Jordan the "correct" interest rate for these calculations should be not 5%, but rather 8% or 10% or even 15% or more. With 10% interest rate, the general school graduate will have a benefit/cost ratio of 5.1:1 and the industrial school graduate 1.2:1 on the basis of per-pupil cost. If the estimates are made on a per-successful graduate cost, the ratios will be 3.26:1 for the general school graduate and 1.2:1 for the industrial school graduate.

In conclusion, it could be stated that to justify the industrial school as a feasible investment, as compared with the general school, its graduates should be expected, on the assumptions (including the 5% interest rate) used in the preceding analysis, to earn 4.2 times what the general school graduates earn (67/16 = 4.2, pages 164 and 165), or 3.1 times what the general school graduate earns on the basis of per-successful graduate cost (67/22 = 3.1, page 165).

However, it is the opinion of the researcher, as well as others (see Corazzini, p. 59), that even if it be supposed that there were an initial wage differential in favor of the industrial school graduate, the general school graduate may catch up, and may even surpass the earnings of the industrial school graduate if the two are long-time work-companions in modern industrial establishments.

CHAPTER X

SUMMARY AND POLICY IMPLICATIONS

Aims of the Research

This research had two aims. The first was to find out the role played by the secondary industrial schools and by the employing establishments of Jordan in the education and training of middle-level manpower. The second was to find out the relative costs and effectiveness of occupational preparation through the industrial schools plus training in the employing establishments as compared with preparation through general schooling plus training in the employing establishments. The findings of the research throw some light on two main issues in occupational education and training in Jordan, the functions that should be performed by the educational and the employment systems and the curriculum contents to be offered by the two systems. Implicit in these two issues is the element of coordination of functions between the two systems.

Methodology and Instruments

A mail questionnaire was sent to home addresses of all graduates of two industrial schools for 1963/64, 1964/65, and 1965/66.[1] Questionnaires were sent to 352 graduates. The aim

[1]There are four industrial schools in Jordan. One has not yet had a graduating class. The other is located in occupied Jordan and had to be excluded from the survey.

was to determine the whereabouts of the graduates, including knowing the addresses of establishments employing graduates in Jordan. Answers were received from 86% of the total. It was found that 194 graduates (55.1% of the total number of graduates) were employed in Jordan. Sixty-three graduates were eliminated from the survey because they were employed in inaccessible establishments, 41 because of internal work conditions. As a result 90 employed graduates were interviewed. All of the 90 graduates were interviewed in their establishments with a prepared set of questions. The researcher also held discussions with the employers or their representatives, such as personnel officers and work supervisors.

One of the aims of the interviews was to determine the extent to which the school curriculum was utilized in job performance. The school curriculum was divided into four components: the specific skills, the specific theory, the general skills, and the general theory components. Combining his own judgment and the discussions with the graduates and their employers, the researcher rated each of the employed graduates according to the utilization of each of the curriculum components in job performance.

In addition to the 90 graduates, 22 work-companions of the graduates and 58 workers doing the same tasks as the graduates in establishments not employing graduates were interviewed. Employers or their representatives in these establishments were also interviewed. The aim of these interviews was to compare the educational and training backgrounds of these workers with those of the

industrial school graduates and to learn from the employers about the training and recruitment policies of the employing establishments.

The researcher also visited the two industrial schools and interviewed the principals and some of the teachers. The final year graduating students were interviewed about their academic and social backgrounds, their past occupational aspirations, and their future occupational plans.

Limitations of the Research

As a result of the Middle East hostilities of 1967, one of the three secondary industrial schools with graduates came to be in the occupied territory. Also, a number of employing establishments were inaccessible for the research, and many of the graduates could not be located or were found unemployed because of the war.

The results with respect to work-companions should be generalized with caution as the sample could not be drawn by strict random methods.

There is one special limitation on the ability to generalize from the findings to other countries. The industrial schools in Jordan are probably atypical in one important respect. The recruited students are not underachievers or likely drop-outs, as is often reported the case in other countries; they are students selected from among the best or better students who passed the Public Preparatory Examination. In using the results for international comparisons this fact should be kept in mind.

There is, however, concrete evidence from a parallel study conducted in Tunisia by the same researcher that some of the salient findings reported in this Jordanian study reflect a similar situation in at least one other country. (The Tunisian study has been written up separately, but brief mention will be made later in this chapter of certain parallels with Jordan.)

The Main Findings

There are three systems of occupational education and training in Jordan. The first is the United Nations training centers for the Palestinean refugees; the second is the private philanthropic training centers; and the third, which is the focus of the research, is the Ministry of Education industrial schools. Industrial education and training is provided by the Ministry of Education for 2% of the total enrolment in the secondary (senior high) schools. Education accounts for 7% of the national budget of which 3% is allocated to industrial education and training.

Students recruited to the industrial secondary school are mainly of poor family background but are among the better or the best students in their previous schools. The number of applicants to the schools far exceeds the number that can be admitted, and this enables the Ministry of Education to be selective. About 50% of the interviewed graduates ranked among the top five students in their previous schools. In most cases, fathers were the main decision-makers for their sons to join the industrial schools.

Fathers, it seems, believe that the industrial school is a likely way to good employment and income. On the other hand, students were found to have occupational aspirations which do not coincide with the terminal nature of the school. Many of them plan to pursue higher education after working for a number of years.

Of the 352 graduates for the three years covered by the research, 55.1% were found to be employed in Jordan, 15.4% are studying abroad, 9.4% are employed abroad, 7.5% are unemployed, and 12.6% could not be located. Of the 90 interviewed graduates, 96% are employed in the public and mixed industrial sectors and 4% in the private sector. Graduates seek employment in the public sector because the initial wages, generally specified by law, are higher than those offered by the establishments of the private sector. Some graduates accept employment outside the public sector at a lower wage, either as a stepping stone to the public sector, or for benefits that offset the wage differentials, such as the acquisition of new skills that have marketable value in the future. It was found that 76.7% of the interviewed graduates experienced a period of initial unemployment that ranged from one to twelve months, and 63.3% of them had changed their place of work more than once.

The following are the findings concerning the utilization of the industrial school curriculum in current job performance. Of the 90 interviewed employed graduates, 27.7% of them utilized the school-learned specific skills in current jobs, 46.3% of them

found the specific theory useful in performing current jobs, 53.7% of them found the general skills helpful, and all 90 interviewees found the general theory helpful in the current jobs as well as in acquiring new specific skills or in upgrading old ones. The data produced a cumulative scale in which the utilization of a component in the scale necessarily means that the graduate is using all the components below it in the scale. The general theory component has the highest frequency of use; after this, in descending order of frequency, come the general skills, the specific theory, and the specific skills components.

These findings suggest that the more specific the training provided by the educational system, the less its likelihood of being relevant to actual job-related needs of the employment system. The more general and theoretical aspects of the training and education provided by the educational system, on the other hand, are most likely to be relevant to the actual job-related qualifications needed by the employment system.

Work-companions of graduates were found to have either elementary or secondary general education backgrounds. Those work-companions who participated with the graduates of the industrial schools in in-employment training programs have a general secondary educational background. On the other hand, graduates of industrial schools currently utilizing school-learned skills have work-companions who have only some elementary education, the companions acquired their skills in workshop apprenticeship training.

The private sector, in which only 4% of the graduates were found, has a recruitment policy that rarely includes industrial school graduates. Graduates demand an initial salary higher than that offered by employers of the private sector. Employers prefer either to promote a person trained in the employing establishment to a vacant post, or employ persons who have many years of actual work experiences in small workshops. It was found that 26% of the labor force of ten establishments not employing graduates have some secondary education. It was also found that in most cases the time needed for in-employment training of new recruits with some general secondary education ranged from one to six months, while few required more than six months. The secondary industrial school graduates who undergo the same or similar training in the employing establishments also have spent a period of three years of specific workshop training in the school.

The per-pupil cost of the secondary industrial school as compared with that of the secondary general school is of the ratio of 9.5:1 (while the ratio is 4.8:1 if the per-successful graduate cost is taken as the basis for calculations).

Based on initial salaries (assuming 20 years of work at the same wage differential over the ninth grader who terminates his education to work and using 5% discount rate), the benefit/cost ratio for the industrial school graduate is 1.6:1 and for the general school is 6.7:1 on the basis of per-pupil cost. On the basis of per-successful graduate cost, the ratio for the industrial

school remains the same, that is 1.6, while that of the general school graduate is 5:1.

Using a 10% discount rate, the industrial school graduate will have a benefit/cost ratio of 1.2:1 and the general school graduate 5.1:1 on the basis of per-pupil cost. If the estimates are made on a per-successful graduate cost, the ratios will be 1.2:1 for the industrial school graduate and 3.26:1 for the general school graduate.

Main Findings in Tunisia

While the context of education and training for industry in Tunisia is in some respects markedly different from that in Jordan, the main conclusions reached in Jordan were, on the whole, reinforced rather than controverted by the Tunisian findings. The first marked similarity of findings concerns utilization of the curriculum of the industrial sections of secondary schools in current jobs. Replicating the same method of rating curriculum components applied in Jordan, it was found that the specific skills component was the least utilized and the general theory component the most utilized in current job performance. As for relative costs, the annual private and public per-pupil cost in industrial sections is twice that of general sections.

On the other hand, it is worth noting two differences between Jordan and Tunisia. First, the employment system in Tunisia plays a more decisive role in formal occupational training than it does in Jordan. Several major employing establishments

in Tunisia, such as the railways, the cement factory, the electricity power stations, the civil aviation department, etc., have training centers for already-employed workers or those committed for work. Second, the Tunisian Government has established the Office of Training and Employment which acts as an intervening coordinating system between the educational and the employment systems. The Office supervises the training activities of the employing establishments, directs apprenticeship training of the elementary school graduates in the employing establishments, and provides accelerated training for drop-outs of the secondary schools and upgrading training for skilled workers.

These two differences found in Tunisia--namely, the greater training role of the employment system and the existence of the Office as an intervening training organization--suggest possible lines of action for Jordan in dealing with its problems of occupational education and training.

Implications for Policy

The findings in Jordan, reinforced by those of Tunisia, suggest that it would be a good policy for the educational system to put less emphasis on specific training and more emphasis on seeking to raise the human potential of students in order to produce readily trainable, rather than specifically trained, persons. The specific training required should be provided in employment, either on the job or in job-related outside instruction in close cooperation with the employing establishments.

With this in view, the four secondary industrial schools, which now constitute a separate system, could be better utilized if they are incorporated into the system of secondary general schools. Each industrial school could be a pre-occupational training center for at least two neighboring secondary general schools with a combined enrolment of 1500 students. Thus, the general schools would become comprehensive schools, and each of the secondary industrial schools would become a training center incorporated within two secondary schools. The pre-occupational centers could provide general skills training and general technological occupational foundations for the students of the incorporating secondary schools. Specific training in some of the trades might be given to some students sponsored by employing establishments on elective basis.

A large share of the future investment in occupational education and training by the government would be better utilized to expand and improve training opportunities within the employment system. It should be primarily directed towards persons already in or at the point of employment.

The middle-level manpower of the private sector of Jordan needs an occupational upgrading program of education and training. A center providing such a program could be located in the industrial area in the outskirts of Amman. The curriculum of the Center should emphasize the theoretical foundations for major fields of trade, such as the mechanical, the electrical, and the mechanical,

and the upgrading of the general education of those who have only elementary education. Attendance could be arranged on a part-time sandwich or evening course basis. The benefiting establishments could contribute to the costs through a levy based on a percentage of salaries paid to their labor force.

Some of the public sector establishments, the major employers of the graduates of the secondary industrial schools, were found to have trained graduates of the industrial schools in job-related skills. The government should establish well organized training programs in the major ministries and departments. The recruits would have secondary general education with an emphasis on mathematics and the sciences.

A kind of apprenticeship system should be organized for those who do not pass the Preparatory Public Examination held at the end of the ninth grade. The Ministry of Social Affairs, which is in charge of labor matters in Jordan, should establish an employment office that will help the ninth grade drop-outs be placed in various private or public sector workshops for training in a specified trade. Such apprenticeship could be supplemented by evening or part-time attendance at the upgrading training center suggested above. Such an organized system of apprenticeship would supply the market with skilled workers in some of the traditional and modern trades, such as carpentry, shoe-making, tailoring, vehicle repairing, construction electrical work, masonry, etc. Diplomas could be granted at the end of the apprenticeship period after passing the necessary examinations.

In order to articulate the education and training activities of the education and employment systems, it is suggested that an Occupational Training Organization (OTO) be established. Labor, employers, the Ministry of Education, and the Ministry of Social Affairs should be represented in the OTO. In addition, experts from the International Labor Organization would be needed. The OTO should coordinate the educational and pre-occupational activities of the educational system, the on-the-job apprenticeship training, and the upgrading training activities of the Center to be attached to the employing establishments. OTO could act as a source of expert advice on matters of curriculum construction and instruction and could present a periodic resumé of changing manpower needs.

It is suggested that the Ministry of Education, with the cooperation of the OTO, establish a guidance and counseling service to assist students and their families by keeping them informed of occupational opportunities and matching the aptitudes and interests of the individual students to the opportunities. This service would work in close cooperation with public and private employers and with the Ministry of Social Affairs. It would also train teachers to serve as occupational counselors.

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APPENDIX A

NAMES OF PERSONS CONTACTED OR INTERVIEWED

The researcher is indebted to His Excellency Ahmed Tuqan, Deputy Prime Minister of Jordan, whose deep knowledge of education in the Arab World was a source of guidance and inspiration. The researcher is also thankful to Dr. Nuri Shafiq, Under-secretary of the Ministry of Education, who acted as a field advisor and offered his sincere support and help for the research.

The researcher expresses his gratitude to the following who either facilitated the visit of their establishments or were themselves interviewed:

Mr. Saad el-Tell, General Director, Jordan Petroleum Company

Mr. Ramiz Malhees, Technical Director, Jordan Petroleum Company

Mr. Usuf Dajani, Chief Engineer, Jordan Petroleum Company

Mr. Malik Kattan, Chief, Engineering Section, Petroleum Company

Mr. Ziad Annab, Director, Jordan Industrial Development Bank

Mr. Faruq Tuqan, Chief Economic Analyst. Industrial Bank

Mr. Mahmud al-Khalili, Economic Analyst, Industrial Bank

Mr. Fayez al-Khatib, Principal of Amman Industrial School

Mr. Abdul-Rahman Kittanih, Principal, Nablus Industrial School

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Mr. A. Hijazi, Chief, Personnel, Wet Battery Factory

Mr. Hani Dakhqan, Chief Engineer, Iron and Steel Factory

Mr. Khalid al-Rifai, Chief Engineer, Cement Factory

Mr. Adnan al-Bayat, Technical Director, Broadcasting Station

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Mr. M. al-Muhtadi, Personnel Officer, Pharmaceutical Company.

Mr. Musa Abdul-Nabi, Foundry Company

Mr. Mansour Kattan, Tankers' Company