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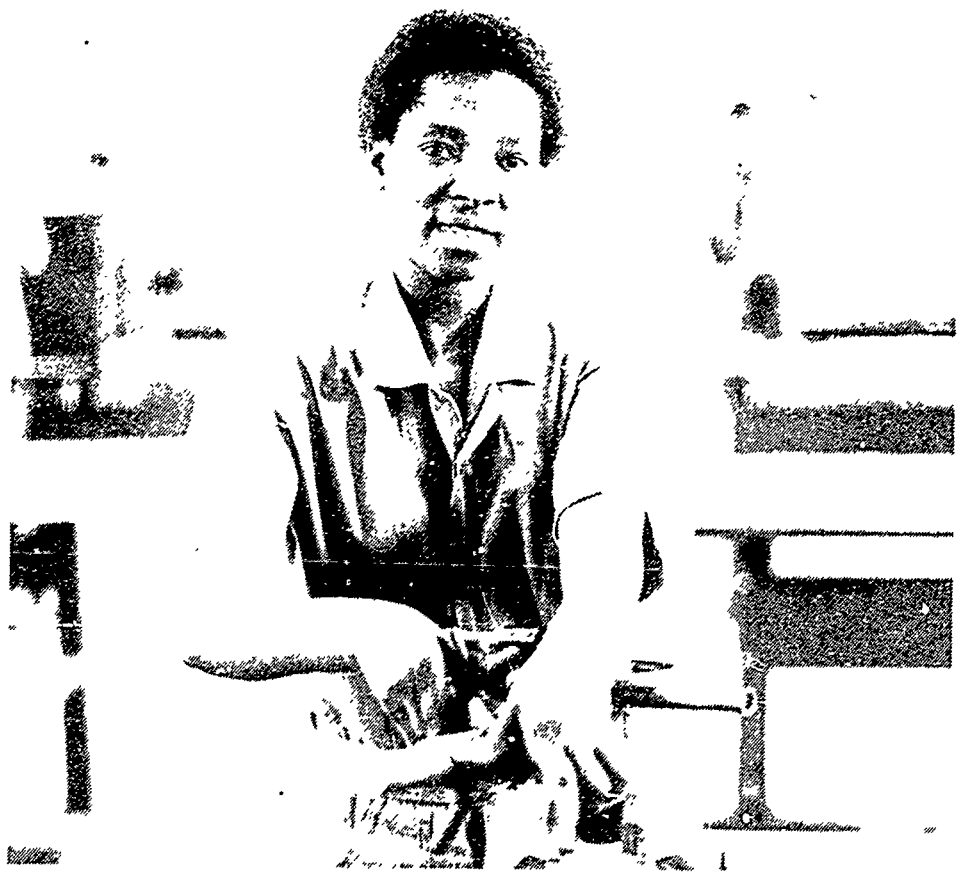
ABSTRACT

This paper looks at the position taken in available literature and evaluation reports of multinational and bilateral agencies in regard to vocational education in developing countries. Section 1 provides background on such topics as links between education and development, support of vocational education, diversified secondary education, foreign aid, public institutions, and costs. Section 2 summarizes criticism that focused on the emphasis on financial support for formal public vocational schools. Discussion of opposition to the criticism is found in Section 3. Section 4 presents a brief overview of the purpose, limitations, and work method of this paper. Study findings are presented in sections 5 and 6. Section 5 discusses vocational education in developing countries. It covers objectives, structure, content, technology (administration, teachers, teaching methods), external productivity, internal efficiency, costs, and financing of vocational education systems. Section 6 comments on vocational projects in the developing countries. It covers identification, preparation, execution, evaluation, and outcome of vocational education projects. Issues concerning hardware (buildings, equipment) and software (curricula, teacher training, technical cooperation) are also touched upon. A selective bibliography is appended. A summary precedes the report itself. (YLB)

Education Division Documents. No. 34

Vocational Education in Developing Countries

Mats Hultin



August 1987

Vocational Education in Developing Countries

A Review of Studies and Project Experience

by

Mats Hultin

PREFACE

The purpose of this study is to review the experience of vocational education projects financed by external agencies and present the findings in a comprehensive report. It covers a vast number of projects and the findings thus are of general interest.

The study was undertaken by Mats Hultin recently retired from a post in the Education Department of the World Bank and carried out during 1986 and 1987. It should be seen as part of SIDAs development of a long-term strategy for assistance in the field of education.

Vocational education/training has ever since the 50s been one of the priority areas for foreign assistance to developing countries. The importance of vocational training programmes has increased in the wake of the present economic crisis which is afflicting most of the developing countries. The study reflects this very fact and is hoped to improve the effectiveness and efficiency of assistance in this field in the future.

Stockholm 5 August 1987

Lennart Wohlgemuth
Head, Education Division

VOCATIONAL EDUCATION IN DEVELOPING COUNTRIES

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VOCATIONAL EDUCATION IN DEVELOPING COUNTRIES

A review of studies and project experiences.

> "If my nephew Fernando decided to learn some art and craft, I would feel very happy about it since physicians and lawyers are plenty around us and what we need are good mechanics and farmers so that our country may progress and welfare spread."
> Simon Bolivar, El libertador 1820.

0 SUMMARY

0.01 Vocational education was from the beginning one of the priorities of foreign aid to developing countries. This aid came eventually to cover formal vocational schools, diversified schools and many types of nonformal skill training centres. The schools which received support were, with few exceptions, public and costs were high. But it was felt that they would meet urgent manpower needs and give high rates of return on the investments.

0.02 The emphasis of aid givers on formal public vocational schools was eventually criticized. The schools were said to offer irrelevant courses, to produce students who were no more employable than those from academic schools, to have poor teachers and to incur costs beyond what the governments could afford. The critics proposed that public authorities should restrict their responsibility for education to general, basic education while enterprises should have the main respoonsibility for vocational education.

0.03 But the critics encountered some opposition. It was claimed that their suggestions would not meet training needs in rural areas, of cottage industries, and of women. Enterprises would tend to look after their own interests and these might not coincide with those of society and individuals. The opponents felt that the

public diversified schools (the main target of the critics) would eventually meet the basic training needs of the technological societies better than enterprise institutions in the LDC:s also, while the latter would be needed in follow up pre- and inservice training.

The purpose of this paper has been to see where current literature and project studies stand on the issues raised through the discussions summarized above. 0.04

A review of the objective of vocational education shows three major developments. In the beginning the objective was to provide well defined specialized skills. The specializations were many. The objective was eventually extended to include prevocational training and attempts to change attitudes to manual work, to stop the exodus to cities, and so on. In a third and final stage the objective has been changed to meet needs in a rapidly changing information and technology society. Vocational education shall have a broad general base on which easily changed shorter specialized courses can be built. Attempts to change attitudes have received less priority. 0.05

There are three major structures of vocational education. These partially correspond to the educational objectives stated above: 0.06

i) a parallel system of vocational and academic schools where the former offer many specializations,

ii) diversified secondary schools with prevocational and vocational programs in addition to academic programs. This reflects the extended second educational objective development,

iii) the nonformal centres with preservice and inservice training which, together with ii) above, reflect the third stage of development in educational objectives.

The study of vocational education in the LDC:s shows that countries which have not yet attained universal primary education and have low secondary education enrollment ratios emphasize vocatio- 0.07

nal education as in category i), often at lower secondary level. When primary education becomes universal and the secondary enrollment ratio increases to 50 % or more, a combination of ii) and iii) is most suitable although the conventional vocational curricula of the diversified schools has to change and become wider and less specialized.

0.08 The diversified schools would offer a few basic vocational programs using a modular approach with the vocational subjects gradually becoming more important. The curricula in the post-secondary level centres, which would conclude vocational education in the diversified schools, would be specialized and the courses of varying duration - from a few days to a year or more.

0.09 Vocational schools have so far been administered by many agencies, with varying degrees of success. In a structure comprising diversified schools and skill training centres, the former should be managed by the Ministry of Education and the latter by enterprises or enterprise-related agencies including technical ministries (e.g labor, agriculture or industry). The diversified schools offer academic education programs and broad, basic vocational education programs and the Ministry of Education is therefore the obvious administrator. The skill centres should cooperate closely with the enterprises and it is this factor which should determine their administrative organization. Both diversified schools and skill centres must have advisory councils with representatives from the labor market.

0.10 Difficulties in hiring and retaining vocational teachers can be reduced through closer cooperation with the enterprises and the use of their staff, released from other assignments, as teachers on a full time or part time basis. This would also ensure relevant curricula and equipment in the schools.

The teaching can be improved through the inclusion of production work in the schools and practical training in the enterprises for the students. The latter could be carried out through "alternance training". The production work in the schools should not be allowed to overshadow the schools' main purpose which is to teach. Computors, robots and simulators will form important parts of both curricula and teaching methodology even in the LDC:s. They are needed to improve external productivity and internal efficiency and to reduce costs. 0.11

Manpower estimates and rate of return calculations are being used to maximize and estimate the external productivity of vocational schools. The methods have some shortcomings as conducted so far. It is suggested that manpower estimates should be carried out over a short term perspective and should only indicate more general training needs, often based on tracer studies. Rate of return calculations may supplement the manpower estimates but cannot be used as single instruments to assess training needs and external productivity. 0.12

Retention and attrition of students in vocational education are generally well dealt with by those concerned. Less attention has been paid to other aspects of the internal efficiency of vocational schools as measured in staff and space utilization. Unit capital and recurrent costs are high in vocational education and efforts must be made to improve the use of staff and facilities. Major savings can be achieved but it must, nevertheless, be realized that unit costs in vocational education will always remain high and the rates of return therefore lower than for investments in some academic programs. Aid agencies might well include recurrent cost financing in their project packages. 0.13

The financing of vocational education should be improved and payroll taxes earmarked for vocational education deserve wider use. They are suitable for the enterprise-related skill training centres. Conventional taxes must also be used. Student fees cannot be recommended in pre-service training as it is difficult for vocational schools to recruit students. 0.14

0.15 Vocational education has not been as well researched as general education. The external productivity, internal efficiency and cost effectiveness of various training models deserve more attention. This is also true of agricultural education which has been biased towards males despite the fact that agriculture is a female occupation in many LDC:s.

0.16 The review of the experience of vocational education projects financed by external agencies shows that public formal vocational education institutions have been overemphasized at the expense of support to private or other enterprise-related nonformal institutions. The needs of rural areas and women have received insufficient attention. Employers have not been properly involved in projects. The proposed system of mixed formal/nonformal public/private vocational education requires that future projects cover all components.

0.17 Vocational education projects have often suffered from serious time and cost overruns caused by unrealistic estimates and too great complexity. They have also suffered occasionally from inefficient implementation units.

0.18 The outcome and impact of vocational projects have on the whole been good despite problems in implementation. Nonformal institutions have done less well and diversified schools have often been introduced too early to become successful. Vocational centres have had sufficient numbers of students. This has been less true of vocational programs in diversified schools. Contrary to common belief the employment rates of project graduates have been good, but this might be so because of the very unique status and high quality of externally financed vocational schools.

0.19 Curriculum development, the production of learning materials and other software have been useful and have contributed in particular to institution building. Software items are, nevertheless,

difficult to execute and need more attention and often more technical assistance then they have generally received. Research findings and studies included in projects have not been used as of as they deserve.

The overall impression of the evaluation reports is that the least developed countries should receive more attention in project design and execution than is now the case, while more developed aid recipients could manage with less. Better cooperation among aid agencies could obviate internal competition and, where objectives, structure, content etc are concerned, conflicting vocational education institutions. 0.20

The overall impression of this review of vocational education and projects is that 0.21

i) the critics have correctly identified problems in the structure, external productivity, internal efficiency and costs of many vocational educations systems and have appropriately suggested greater involvement by enterprises in vocational education,

ii) but they have not fully realized that an enterprise-related system cannot alone meet the training needs of individuals or of society in general - nor have they appreciated that at a certain stage of education development in a society, some kind of diversified education becomes the best model for basic vocational training,

iii) and finally, neither the critics nor their opponents can guarantee a vocational education system which on the strength of its own characteristics would make vocational education as attractive as academic education to the average LDC student. Such remedies reside the education sector.

0.22 The suggested two level vocational education system with a mixture of public basic and private enterprise follow up responsibility reflects the findings of the research literature and of the review of project evaluation reports.

1 BACKGROUND

1.01 Links between education and development. What Simon Bolivar, Latin America's liberator, said about Colombia more than 160 years ago is still true for many developing countries. The rich and abundant human resources have not yet been developed to their full and relevant potential in Latin America, in Africa, or in many parts of Asia.

1.02 The links between the quantity and quality of a society's education system and its economic and social development are complicated. It is not possible to guarantee that investments in the former will automatically accelerate the latter. Investments in schools and universities and various other learning activities may be necessary but alone they are never sufficient. Many authorities in the 1950's and the 1960's believed they were. They considered it proven that there was a straight and positive correlation between education and economic/social development. Investments in secondary education were seen as particularly productive at that time and consequently many OECD countries rapidly expanded their secondary education systems.

1.03 Vocational education. It was therefore natural that support of education became a priority when the developed countries seriously started to provide financial and technical assistance to the developing countries (the LDC:s). If education was a priority among the donors, rapid industrialization was often a priority among the recipients - the LDC:s. Rapid industrialization was supposed to create wealth and independence from former colonial powers. The convergence of these two policies led to the support of vocational education, particularly at upper secondary and post secondary level.

The assessment of how many and what types of education programs to support was largely based on labor market analyses and manpower projections. Such analyses and projections had been initiated in planned economies as early as in the 1920's. They became en vogue in many market economies after the Second World War and were widely used in manpower discussions in the developing world during the 1950's - 1970's. 1.04

The analysis of the situation in the LDC:s generally indicated serious shortages of middle level technicians and skilled workers. The situation had not changed much since Bolivar's days. The education aid of the first decades came therefore to a large extent to comprise technical and vocational schools and training centres at the secondary and post secondary level to meet perceived needs in the formal urban modern industrial sector. "Good mechanics" were wanted. 1.05

Bolivar's reference to the importance of farmers received less attention. One reason for this neglect was perhaps the difficulty in estimating needs in the rural agricultural sector of the economy. This does not imply that there were no agricultural schools included in the aid packages of the bilateral and multilateral agencies. There were, but the recipients were less interested in them. "Rural development" was not yet invented. This was so despite the fact that agriculture was, and of course still is, a most important source of livelihood for people in the developing world. It provides food, shelter and clothes for 50 - 80 % of the population in many LDC:s. 1.06

Diversified secondary education. Influenced by the development in the educational thinking which started to consider general education as also having a developmental value, aid givers increasingly financed general secondary education, but with a vocational slant. In the 1960's and 1970's assistance was given to the broadening of the curricula in the general (academic) secondary schools to include "practical" subjects, programs and courses. 1.07

The general academic secondary schools were transformed into "diversified" (or "comprehensive" or "integrated") secondary schools, sometimes not much different from North American high schools. *

1.08 Eventually the purpose of the "vocationalization" and/or "diversification" of secondary education widened beyond the training of manpower for industry, commerce and (to a lesser extent) agriculture. They were supposed (as stated by Lillis and Hogan in 1983) to

> "alleviate unemployment
> reorient student attitudes towards rural society
> halt urban migration
> transmit skills and attitudes useful in employment"

This was a tall order. It implied that the vocational and diversified schools would do much more than train skills to be applied in industry, commerce, agriculture, transport, etc. A change in young people's attitudes and career aspirations and life expectations became more important education objectives than the acquisition of some specific skills. Social values and attitudes should be changed through vocational education and practical subjects. It was believed that the school could do those things without a concomitant change in society itself.

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* There are no generally agreed definitions about objectives, structures and contents of a "diversified" secondary school. The World Bank stated in its education sector policy paper of 1980 as follows: "Many developing countries, in an attempt to adapt the content of secondary education to the expected job needs of those leaving school, have diversified the curriculum by introducing practical or occupational subjects into an otherwise completely academic program. Two models are prevalent. The first model introduces practical subjects - industrial arts, home economics, agriculture - at the lower secondary level to provide prevocational orientation and to develop a positive attitude toward work. The second model includes a general academic stream, plus one or more specialized occupational streams, usually at the upper secondary level, depending on the economic life of the community." To these two models as described by the World Bank should be added a third, also at the upper secondary level, in which the students during the first year have a large common core of basically general education subjects and then gradually specialize during the following two or three academic years. The diversification increases thus each year in this model.

Foreign aid. All major aid givers - multilateral such as UNDP and the World Bank, and bilateral as USA, the Sovjet Union, UK, France, Germany, Sweden, etc - have financed and still finance vocational and/or diversified education. "Vocational education" in this context covers industrial education, agricultural education, business schools and training centres, formal and non-formal * for adolescents and adults, for men and/or women, while "diversified education" would be of the type described in the footnote to paragraph 1.07. Aid has often been channelled through and administrated by ILO, FAO and Unesco. Voluntary organizations have also financed and managed vocational and diversified schools. 1.09

Public institutions. The institutions which have received official aid are with few exceptions "public" and provide mostly "formal" education. They are run by public authorities; federal or state governments, provincial or minicipal boards, etc. This is true despite the fact that the products of these vocational schools - the graduates - are to a large extent employed in the private or semi-private labor market, or are self employed. It has proved difficult for public aid agencies to find easy ways to assist private nonformal training institutions. 1.10

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* The term "formal education" is used in this paper for the learning which generally takes place in schools and other educational institutions mostly managed by a Ministry of Education, with clearly defined objectives, a fairly rigid grade structure, classroom teaching, specific entrance and exit requirements and with children and teenagers as students. The term "nonformal education" is used for education which primarily takes place in training centres and education institutions often under other agencies than a Ministry of Education with flexible structures, courses of varying duration (from years down to a few days), often with "open" entrance and no examinations and often catering for adults or more mature adolescents already in the labor market. This group includes most ILO sponsored institutions, the Latin American training institutions (SENA etc), the British open TV University, correspondence education etc. The term "informal" education is used for the transfer of knowledge which takes place in a work place from an older skilled worker to a novice, through reading newspapers etc, i.e. the unstructured learning every human being takes part in.

1.11 Costs. All concerned have hopefully been aware of the high capital and recurrent units costs of vocational/diversified education compared to those of general education. But the costs, which have to be paid almost entirely through taxes, have been accepted in the belief that the social rate of return on investments in vocational/diversified education would be high, the private rate of return high enough to attract student to the schools, and the employability of the vocational/diversified school graduates would be good.

2 CRITICISM

2.01 The education achievement in the LDC:s was considerable in the 1950's - 1970's. Enrollment increased at all levels; both in general and vocational/diversified education. It is in education (and in health) that progress in the LDC:s has been most conspicuous. But the education "explosion" has not been followed by similar social and economic progress in the rest of society. The substantial investments in education have therefore been increasingly criticized. This has been so particularly in countries where education has been allowed to comprise as much as one third or even more of all public expenditure. It has also been realized that education alone is not enough. This realization, together with the general economic squeeze during the late 1970's and early 1980's has led to cuts in education which have affected both general and vocational/diversified education.

2.02 In vocational/diversified education additional points have been made by a new generation of education economists and manpower specialists. The large investments in such education have been criticized. Objectives, structure and content have been questioned. Foster raised doubts as early as two decades ago (in his studies of the "vocational school fallacy" which referred to Ghana and Africa). His doubts have once again been widely discussed.

Manpower estimates. The critics claim that there has been an overbelief in manpower estimates which has led to the establishment of institutions offering irrelevant programs, often too specialized and with too sophisticated programs and equipment. Furthermore many vocational schools are said to be too rigid in their structure and administration and unable to adjust their programs to rapidly changing markets. It has also been claimed that the schools have had great difficulties in recruiting students. Vocational schools and vocational programs in diversified schools are said to be the last choice of students and considered second rate. 2.03

Unemployment. It has been said that vocational and diversified school graduates are just as unemployed as other school graduates. Or conversely - a graduate from a general academic school would just as easily get a job and equivalent pay. Those students who do enter the vocational programs are said to have never been seriously interested in entering the labor market after graduation or in taking up the jobs for which they have been trained. They are said to have entered these programs with the sole intention of subsequently obtaining entry to a higher education institution and obtaining a white collar job. The overall shortage of middle level manpower and skilled workers would thus not have been reduced in the LDC's despite heavy investments in public vocational schools, centres and diversified programs. 2.04

Staffing. The vocational education programs of the LDC's are said to have had more difficulties than other programs in recruiting and retaining teachers and other staff. Salaries have not been competitive with those of industry and with other sectors of the labor market. Vocational teachers shall have good practical experience from industry, business and agriculture. Developed countries often require at least five years of such experience. It has seldom been possible to recruit teachers with such experience to the vocational programs in the LDC:s. Many LDC vocational programs therefore have to manage with teachers who have just graduated from teacher training courses with little or no practical experience (neither before or after their pedago- 2.05

gical training). Many vocational teachers are said to desert the schools as soon as they get an opportunity to do so for a more lucrative job in the private sector. A vocational teacher has a skill of value in the labor market outside the school. This is much less the case for teachers of academic subjects.

2.06 Costs. It is claimed that many LDC governments have in reality not been aware of the high costs of running a vocational program. Vocational programs had too small recurrent budgets even prior to the crisis of the 1970's. They became, it is claimed, comparatively worse off when their budgets were cut as a result of the crisis. It is much more difficult to cut salaries or to dismiss staff than to reduce funds for instructional equipment, materials, books, consumables and maintenance. Consequently cuts are mainly made in such "other expenditures". Such cuts affect vocational programs more than similar cuts in academic programs. Some 50 % or more of all teaching in good vocational schools is conducted in workshops and laboratories. They are more dependent on equipment, materials and consumables than academic schools for satisfactory performance. Their budget for maintenance and materials may well amount to 40 % of the total compared to as little as 10 % in some academic schools. This shows the role of recurrent funds for satisfactory performance but it also provides a great temptation for authorities to cut.

2.07 In the current situation it is claimed that many LDC's are unable to afford a large public vocational education system of the type which many donors helped to develop during the last three decades. The cost to society both directly and indirectly due to these investments is said to be too high. Many vocational programs are said to have fallen rapidly into decay and the activities are said to have degenerated a few years after the completion of the projects and after the withdrawal of the foreign aid. It is claimed that the vocational education system as supported by foreign donors started off in the wrong direction in many countries. It was both inappropriate and costly. The economic crisis is said to have made things worse.

Proposal. What do the critics propose instead? The critics whose opinions have been summarized above suggest that enterprises and employers, primarily private or semiprivate, should take a more direct and greater responsibility in vocational education. The education authorities by which in this case are meant in particular Ministries of Education, should only be responsible for formal basic general education. Vocational, job preparatory education should follow and be more closely related to the labor market, be more nonformal, on the job, shorter, specialized, sometimes of apprenticeship type and primarily a responsibility for the enterprises. 2.08

"Alternance training" as discussed in the common market countries and by the Council of Europe has also been suggested as more suitable than the usual types of training provided in formal vocational schools. This is a combination of formal and nonformal vocational education and is further described in paras 5.39 -- 5.42 below. 2.09

OPPOSITION TO THE CRITICISM 3

The critics have themselves been criticized. The critics of current vocational school systems in the LDC:s claim that enterprises in the labor market should be able to provide better and cheaper vocational education than public authorities. The discussion has focussed on industrial education and the claims may be true as far as industry and urban areas are concerned. But, say those who oppose the criticism, what about vocational education in rural areas, should it provide agricultural or non agricultural skills? There are few enterprises in rural areas which could follow up formal prevocational education and provide the necessary more specialised skills. These enterprises are, if they exist at all, too small to do so. Furthermore public schools have competed fairly successfully with private schools in commercial subjects. It is also said that the critics have overlooked the need to train men and women not only in the production of goods 3.01

but also in the production of services and in an improved consumption of goods and services. Programs in home economics, health, administration etc form important parts of the LDC economy and have so far been of less interest to the private sector. This sector has also, it is claimed, on the whole been less interested in the vocational training of women.

3.02 The critics are also said to have paid insufficient attention to the manpower needs in the large, non formal economic sector of the LDC:s. What about the training needs of artisans and cottage industries?

3.03 It is also claimed that the critics have tended to forget that on-the-job training and apprenticeship systems have a tendency to teach old fashioned manufacturing methods and bad working habits. There is also a not infrequent misuse of child labor. Changes and improvements in apprenticeships and on-the-job traning systems will only occur when economic advantages are immediate. It is claimed that long term planning and foresight in production methods and the use of labor have not always been the strong side of trades with apprenticeship systems and onthe-job training.

3.04 Those who are not prepared to move the major responsibility for vocational education from the public sector back to the enterprises (where it used to be) claim that enterprises - naturally - have less interest in making the training they provide comprehensive and wide. Comprehensive training would make it easier and tempting for trainees to change jobs on completion of their training. The company might suffer from such mobility. The proponents of the public formal vocational/diversified schools of the type the aid agencies have generally supported in the LDC:s claim that such schools are in a better position to teach chemistry, physics, electronics etc, which form the base for a true understanding of what vocational skills are about. Up to date farming, machine operations, welding, painting, electrical

installations, construction works, the operation of industrial robots and of computers, work at data processing screens etc, are said to be much facilitated if the worker and technician know the scientific basics. Those opposed to the vocational school critics claim that "their school" has the best opportunity to provide such background knowledge. They claim that the major difference between a workshop floor operator in a developed and in a developing country is a difference in understanding of what really happens in the production process. This difference in knowledge would explain differences in productivity, maintenance, willingness to adapt new production methods etc, between developed and developing societies.

Another aspect of vocational education in the LDC:s concerns young people who need vocational education but live in sparsely populated areas of a country or in areas where industries or other potential "training enterprises" do not exist. How and where should such persons receive their training and who should pay for it? It may require expensive boarding. Much of the discussion about secondary education including vocational education in the 1950's and 1960's was concerned with equality and access to education. Diversified secondary education was seen as one way of providing general and vocational secondary education to young people at a reasonable cost regardless of where they happened to live. Some have claimed that the LDC:s cannot afford the luxury of equality above the primary education level. Others claim that equality in education is not only fair but economical. 3.05

THE PAPER 4

Purpose. The purpose of this paper is to see where available literature and evaluation reports of multinational and bilateral agencies stand in the vocational education discussion. If the critics are right, how can the situation be rectified? What are advantages and disadvantages of the different vocational educa- 4.01

tion systems which have been supported by the aid agencies over the years? What types of vocational institutions should be supported? Formal or nonformal schools or training centres? Preservice or inservice? Integrated or separate institutions? Run by governments or by other entities? How can project identification preparation, execution and evaluation be improved? Should not only capital but also recurrent costs be financed? What about technical cooperation and assistance? What can be learnt from evaluations and research?

4.02 Shortcomings. The study has shown, as could have been expected, that no single model can be used everywhere. What works well in Singapore may not work in Cuba or in Kenya. There is a general shortcoming in most papers and reports. They discuss ways to provide vocational education, but the projects and programs which are reviewed are almost exclusively in the public sector and mostly formal institutions. To compare a formal public system with a mixed formal - nonformal, public - private system without knowing much of the latter is no easy task. We have something of a mixed system in Latin America but that is all. In Asia the Chinese have claimed that enterprise-related vocational education is not as economical as originally thought but otherwise reports from Asian countries provide little information from such education. There is almost no experience of mixed systems in Africa.

4.03 Literature and reports suffer also, with few exceptions, from another deficiency. Only a few studies investigate the internal efficiency of vocational education institutions, the strength of various teaching methods and the utilization of staff and facilities. We do not know how recurrent costs could be reduced by the better use of teachers and of workshops and laboratories. Only a few recent studies research the costs of training a vocational school graduate and compare it with the cost of an academic school graduate (para 5.63).

Many evaluations have been conducted so soon after project completion that little is known about the external productivity of the schools, the employment of the graduates and their pay. Early evaluations may also mean that the schools have not yet been handed over by the aid donor to the aid recipient, which greatly reduces the value of the findings. 4.04

Work method. The paper is based on literature research conducted at The International Bureau of Education in Geneva and at the National Institute of Education in Washington DC. Some 350 studies were received in abstracts and 30 were studied comprehensively. I have, furthermore, had access to evaluations made by the World Bank, ILO, FAO, Unesco and German and British aid agencies of some 200 projects with major vocational education components. Research papers by educators in London, Stockholm, Washington DC, have also been used. The issues, conclusions and proposals in this paper represent my own interpretation of what I have read and experienced and I shall not refer to the source of every statement. 4.05

FINDINGS 5

The findings will be presented in two sections. The first section will discuss vocational education in the LDC:s. The second and shorter section will comment on vocational projects in the LDC:s. 5.01

The first section covers objectives, structure, content, technology (administration, teachers, teaching methods), external productivity, internal efficiency, costs and financing of vocational education systems. The second part covers identification, preparation, execution, evaluation and outcome of vocational education projects. Issues concerning hardware (buildings, equipment) and software (curricula, teacher training, technical cooperation, etc) will also be touched upon. 5.02

Vocational Education

5.03 Development of Objectives. Vocational education can be structured in different ways. But regardless of structure the objectives (as perceived although not always well defined) have been the provision of skills which could make the trainee employable and productively used in the labor market as rapidly as possible for his own best and for the benefit of the enterprise and society. This was the perception in the LDC:s when the aid agencies entered into action. The approach was basically: "Make me a good welder - and I will be useful to the enterprise and have a reasonable living myself for the rest of my active adult life". This implied that a high degree of specialization in training was good as long as the speciality was in demand. And it was expected to be in demand for a fairly long time. Curricula and syllabi in vocational education were consequently detailed and examinations and tests equally specific. The Sovjet and Chinese vocational education systems have been exponents of this high degree of specialization. But even a country like Sweden has until recently offered hundreds of specializations in formal vocational schools.

5.04 Objectives changed gradually. Vocational education expanded in the LDC:s and in a second phase started to include programs in diversified schools (para 1.07). They would be either vocational or prevocational and would have objectives as described by Lillis and Hogan in their paper quoted above. The prevocational programs were supposed to give some general preparatory knowledge about vocations without really training the students to become carpenters, electricians or welders etc. But the teaching did not always correspond to the objectives. In some countries it primarily comprised simple wood work, metalwork or domestic science etc. It appeared to be a residue of previous "practical subject" programs which had sometimes been introduced in the colonial era and had little relevance to the society of today. In other cases the prevocational teaching was overambitious and

again did not really correspond to the objectives. The schools had been supplied with oversophisticated equipment for mechanical workshops, electronic laboratories etc. The definition of appropriate objectives in the agricultural programs became an even more difficult task in the diversified schools. The teaching came to cover a wide range from general knowledge of agriculture to very active farming on land belonging to the school, which reflected advanced objectives. The easiest area to deal with was education in which, even in a former academic school, straightforward objectives could be defined and also achieved with some success.

5.05 Manual work has a long history of low social status in most cultures and the cultures in the LDC:s comprise no exception. It became therefore a major objective of the diversified schools in this second step of vocational education development to change student attitudes towards manual work. The objective was to be achieved simply by introducing practical courses or subjects in the academic schools. As many students as possible should take the courses regardless of future vocational expectations. In some countries practical subjects and programs became compulsory. This was the case in, for example, India, Brazil, Peru and Cuba. There was little or no research about the right way to achieve such a change in attitudes and definitely nothing which stated that compulsory participation in practical activities would achieve it.

5.06 The third and hitherto final step in the development of objectives in vocational education has been its differentiation into more general and more specific objectives. This is a break with the early specializations as they were often applied. It reflects a response to rapid changes in industry, commerce and agriculture with robotization, computerized dataprocessing and rationalization and the consequent need for adaptability, flexibility and mobility of labor.

5.07 The new demands on vocational education can be and have already in some countries been met by changing the public formal vocational schools including the diversified schools so that they can offer basic general courses with a limited number of programs - a handful only. The programs are, furthermore, often of a modular type to facilitate program changes and transfers of students among programs and schools. Literacy and numeracy training has to be strengthened as the greatly increased use of computors requires a high degree of numeracy and literacy. The technological changes require skilled workers and technicians with a good basic education both in general subjects such as reading and arithmetic and in technical subjects. The basic programs have to be followed by specialized training of shorter duration either in enterprises or in training centres, perhaps of the type ILO has developed and supported in a number of LDC:s. Flexibility in the programs, particularly at the higher level, has become a necessary asset. The schools at both levels have to be up to date where the needs of the labor market are concerned and offer relevant and new programs with new education and training objectives at short notice.

5.08 The "attitudinal objectives" of prevocational programs as offered in diversified schools would be reassessed as a part of this third development phase. "Practical subjects" such as home economics and data and wordprocessing, might of course be included in the courses if they are seen as part of a necessary general education. But practical subjects would not be included as an attempt to change student attitudes to manual work. This seldom works. Programs in Brazil, India and Peru failed and had to be abandoned. They are still offered in some socialist countries with that attitudinal objective. Nevertheless, even in those countries, negative attitudes to certain professions remain. Cuban students prefer white collar jobs if they have a free

choice and Chinese lower secondary school students put some vocational programs low on their list of upper secondary school priorities. *

Structural Developments. Three major structures of full-time formal and nonformal vocational education stand out in the LDC:s in reflecting the objectives as discussed above. 5.09

i) The parallel system in which academic and vocational schools appear in parallel at the secondary level. The vocational programs are often very specialized; industrial schools, agricultural schools, commercial schools. There is not much cooperation and linkage among these schools themselves or with academic schools. They offer 2 - 3 year courses occasionally extended to 4 - 5 years. The structure is rigid and students cannot easily move among programs. They correspond to objectives as described in para 5.03.

ii) The diversified (comprehensive/integrated) upper secondary school structure which, under the same roof and administration, offers academic as well as prevocational and vocational programs reflects the second development in objectives (para 5.04). In

* The school alone obviously cannot create the attitudinal change. There are ultimately factors outside the school which are decisive. Swedish experience is illustrative. Some vocational programs in Swedish upper secondary schools have attracted more students per available place during the last decade than academic programs in science. The private rate of return on education has been seen as higher for a skilled worker and a technician than for many academicians (civil servants and teachers). The academic students have, furthermore, not been the only ones having access to higher education. Even graduates from various types of vocational schools have had a fair chance to enter universities, albeit after some years of working experience. These facts have become well known to parents and children and guided their choice of upper secondary education. No action in school could have been more effective in changing attitudes towards programs in upper secondary education than these labor market and university signals. In most LDC:s the rates of return are different and even in societies where skilled workers and middle level technicians make a reasonable living, attitudinal constraints exist inside and outside school which hinder the necessary development of vocational education.

such schools a stepwise progression towards vocational skills represents the most suitable structure. Several skill programs are offered. Because of the stepwise progression and the frequent use of modular systems, flexibility exists. Students may not have to make a decisive vocational choice as early as in their applications for a place in the school. The overall structure is, nevertheless, often fairly rigid and programs cannot easily be changed from year to year to reflect changes in the labor market. The duration of the training is generally 3 years but 2 and 4 - 5 year courses exist as well.

iii) The third type of school is often referred to as nonformal. Nonformal (footnote to para 1.09) refers more to student clientele and program flexibility and less to structure and administration. Typical examples of these institutions are the ILO supported training centres in many LDC:s. The well known training centres in Latin America - e.g. SENA in Colombia - also belong to this category. They accept both adolescents and adults as students and they may not require any other previous education but literacy, and not even that. They are flexible and offer courses which vary in duration and content. The training is generally narrow and specialized and supposed to be job-oriented.

5.10 The three structures appear side by side in many countries although the diversified schools may be assumed to replace the parallel system eventually. It is obvious from the above description that a combination of ii) and iii) could meet the demands of the new technological society with its requirement of a basic prevocational education followed by shorter specializations and with a vocational education system characterized by a large degree of flexibility. A combination of ii) and iii) is thus a necessity in a society in the third development phase of education objectives (para 5.06).

The vocational education structure must be related to a country's overall stage of education development. In the first development stage a small separate vocational system, primarily at the lower secondary education level and parallel with general education institutions, is the most appropriate model when there is no universal primary education and few students in secondary schools. It would be wrong to offer vocational education only in upper secondary schools and expect a large number of applicants to those schools at a stage of education development when perhaps only 10 - 20 % or less of the age group attend secondary education. Those 10 - 20 % comprise a selection of students from such socio-economic backgrounds and with such career expectations that many will not apply voluntarily for a place in a vocational school. Their aspirations for white collar jobs are not going to change because they are channelled to an education they do not want. An even more serious mistake would be to introduce diversified schools of category ii) at this stage of a country's development. Vocational programs cannot, at this stage of development, compete with academic programs under the same school roof. Such mistakes have been made and explain many of the problems with diversified schools in some LDC:s. The vocational schools will also, as separate institutions, naturally find it difficult to recruit students and compete with academic schools. But their attraction can be enhanced if they are closely attached to the labor market in some way. 5.11

The situation changes when primary education becomes universal and, as often happens, is extended to 8 - 9 years. The country enters now a new education development stage. In such countries lower secondary education has been integrated in the basic system and has become universal. The introduction of such a system implies that all citizens have a large common base prior to further academic education or skill training. Vocational schools at the lower secondary level have to be upgraded. Furthermore, it is known that universal basic education increases the demand for upper secondary education from 10 - 20 % to 50 % or more of the 5.12

age groups. The establishment of attractive vocational education programs at upper secondary level in addition to the traditional academic programs becomes a necessity. No labor market in any LDC could possibly absorb 50 % or more of the age groups in "academic" * jobs. At this stage of a country's development the need for middle level manpower-technicians and skilled workers in various activities would be large. Vocational training must therefore be offered to and made available for a majority of the basic education school leavers.

5.13 The need for flexibility and gradual progress in vocationalization points, as stated above in para 5.10, to a diversified upper secondary level system with vocational programs of a modular type (category ii) followed by training in post secondary centres of the category iii) type. This means that the latter centres would offer vocational preservice training for adolescents who have had their first (pre) vocational training in the diversified schools. The centres would also continue to offer inservice training for adults who have jobs.

5.14 There are good reasons for this preference for diversified schools followed by training centres at this second stage of educational development with universal primary and lower secondary education in an era of rapid technical, social and economical change.

5.15 Upper secondary level (pre) vocational programs should be as easily available as academic programs to compulsory education graduates wherever they live in a country. But vocational education is expensive and the high costs make it difficult to offer vocational schools of the very specialized "parallel type" (i) in every community. They could, if anything, only offer very

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* A large amount of jobs in the computer-robotization society could be done in "white collars" but would nevertheless belong to the technician-skilled worker category.

restricted programs. Some socialist societies such as China have solved this access problem by having parallel type vocational schools with the whole country as the catchment area and by providing boarding facilities. But boarding increases education costs considerably and also has social disadvantages. In addition parents and students prefer schools they know in the neighbourhood even if they do not offer their first choice of program. This implies that the traditional academic school would have an advantage even if it did not represent the first choice as it can be offered in almost any community because of its lower cost. This is not the case for the traditional vocational school. The diversified upper secondary school with a basic less specialized and therefore less expensive vocational program in addition to its academic program could be offered more widely and is therefore the best solution to this dilemma. The technological development which requires flexibility on part of the labor force and good basic education with increased emphasis on literacy and numeracy much needed in dataprocessing and the handling of simulators and robots and in much more complicated agriculture speaks also in favour of close cooperation between academic and vocational education. This would be facilitated in a diversified secondary school.

The problem for communities in offering a parallel type academic and vocational school system is the same where the category iii) type post secondary vocational training centres are concerned. They need larger catchment areas and would often be closely linked to enterprises working in the fields of industry, agriculture, commerce and transport. This is unavoidable but the overall costs for vocational education would, nevertheless, be lower for a combination of diversified secondary education followed by specialized training centres than for an expanded system of parallel vocational and academic schools. 5.16

There are problems with diversified schools but our discussions on the objectives and structures of vocational education point, nevertheless, towards their feasibility also in the many LDC:s 5.17

which have reached the second stage of education development. To introduce them too early is a mistake and they cannot do the full job themselves - follow up activities are needed. But they can, together with training centres, offer effective education at the post compulsory school level.

5.18 Content. The discussion above of the objectives and structure of vocational education necessitates for its full comprehension some reference to the content of education (paras 5.03, 5.04 and 5.07). The diversified school will thus have to offer a broad general education program to all students regardless of their choice of vocational programs. Literacy, numeracy, computer technology and wordprocessing, economics (including home economics) should be strengthened and considered as part of necessary basic education. The upper secondary vocational/diversified school should furthermore offer a few basic programs having a general (pre) vocational value. Physics, chemistry, biology, electronics would also be important subjects in addition to typical vocational subjects (cf para 3.04).

5.19 The gradual increase in vocational content would be reflected in the curriculum of the diversified school. The vocational subjects may occupy a few lessons per week during the first year but would eventually increase and occupy perhaps 50 - 70 % of the time available during the last year. That would mean 3 - 4 days out of 5 each week. The proportion of vocational subjects may mean an increase compared with the curricula in many diversified secondary schools and approach those of vocational schools in parallel systems. But this does not mean a larger degree of specialization but rather a deeper study of basic subjects in vocational education.

5.20 The post secondary training centres with courses of varying duration would follow up and conclude the education of the diversified schools. Their courses would be truly vocational, specialized and adapted to the needs of the labor market. Course content may well vary from year to year and from course to course. A centre would generally offer only a few specializations.

The literature discusses another type of content question related to a changing society. Should emphasis be on the acquisition of basic skills and knowledge and on attitudes in the vocational programs or should one focus on how to learn skills and attitudes and to find knowledge? We have discussed attitudes and doubt whether it is possible to change attitudes radically through any known school subjects or teaching methods. The school may contribute to changes in attitudes but not without a concomitant change in attitudes in society outside the school. Our reaction to the "how" question is similar. Attempts to emphasize "teaching about how to know" rather than about "teaching to know" have obviously not been very successful so far. A scholar once made the point that "it is really more economical and a better investment to make an effort to have these facts in your head than to have to go to the reference book each time you need them". The need to "go back to basics" reflects discontent with the "how to learn approach". Well taught solid general and vocational basic knowledge is probably the best guarantee for adaptability and preparedness to learn additional new skills and to acquire new knowledge given the current state of the art in pedagogy. 5.21

A few additional points on vocational education in the LDC's should be made in this context. Maintenance should be an important part of the content in the vocational courses as should "repair" (rather than "replacement"). Education with productive work and alternance training (paras 5.36, 5.39) offer a natural way to emphasize maintenance and repair work. The content should also reflect the discussion in para 3.01 on consumption and on women. Vocational counselling is an important means to raise a school's external productivity and to channel the students into appropriate jobs (para 5.58). 5.22

Administration. Vocational institutions are often administered by a variety of agencies; ministries of education, ministries of labor, agriculture, industry and so forth. They may also be run by enterprises and voluntary organisations. The experience gained by 5.23

the various administrative agencies has been mixed. Vocational schools in Latin America owned by the religious Catholic Salesianer order have been very well run by dedicated staff. Otherwise vocational schools have been better managed the closer they have been connected with industries and other economic enterprises. Ministries of Education thus often pay more attention to universities and institutes of academic education than to vocational schools. One reason for this neglect is that the vocational school system has so far only comprised a small part of the total system. Another and perhaps more important reason is that the vocational school system has not had the same influence inside and outside the ministry as universities and academic schools. Both these factors have implied that vocational schools administered by Ministries of Education often received less funding and support than other parts of their education system. *

5.24 The situation has been better in vocational schools run by technical ministries (industry, agriculture, transportation etc). But again - the vocational schools have often comprised a small part of their activities and their main responsibilities have been elsewhere and not in education. They have, however, indirect interests in the schools. Many technical ministries run enterprises or have a responsibility for the development of their sector of the economy and want therefore a good supply of skills in the sector.

5.25 Those vocational training institutions which have apparently developed best are those which have been run by employers or by their organisations. The Latin American training centres such as SENA have often been quoted. They are said to have a good administration.

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* Schools of commerce constitute an exception. They are less costly and have a higher social status than other vocational schools and function reasonably well regardless of administrative structure.

The administrative question becomes complicated and difficult when a country reaches the second stage of education development (para 5.12), when a diversified secondary education system with post secondary training centres becomes the most feasible structure. One single administration becomes a necessity in an integrated upper secondary education offering both academic and vocational programs. The Ministry of Education is the most obvious agency. The centres which would follow with job related training should be managed by enterprises and specialized agencies including the Ministry of Agriculture. The best agency to cater for the training needs of artisans and small industries would be the Ministry of Labor if small industries and artisans do not have their own associations to run training centres. 5.26

Ministries of education have as stated above been criticized for their neglect and often poor management of vocational education. There is, nevertheless, no other choice where the administration of the diversified secondary education system is concerned. The number of students in vocational programs in the LDC:s will increase a great deal both in absolute and relative terms in the near future. This should imply that vocational education will automatically receive more attention, funds and status and require better management by the authorities. 5.27

Ministries of education and other administrative organizations will also have to improve the vocational programs in other ways than through increased funding and improved management. A "tripartite" participation in the administration must take place at a decision-making level or at least at an advisory level. The three parties are 5.28

i) the public as represented by the authorities,
ii) the employers and,
iii) the employees.

This arrangement is particularly important for the post secondary training centres. But it should also be made in the diversified secondary schools. Such "tripartite" cooperation is an important tool to ensure the relevance of curricula, competent teachers and a healthy mixture of education and work in the school and jobs for the graduates.

5.29 Advisory councils with the participation of employers and employees have been tried at various administrative levels (school, province, country). It has been difficult to get them to function satisfactorily in LDC:s. LDC school administrators and teachers have seen advisory councils as a threat to their independence and even to their job security. There is seldom anything resembling school boards in the LDC:s and school staff are not accustomed to cooperation with other parties. This lack of experience explains problems with the vocational councils. Most headmasters are a part of a central hierarchy and are not accustomed to discuss curricula, teacher quality and student placements with "outsiders" in local industry or other enterprises, not even when the latter represent the employers of their graduates. At the same time the "outsiders" lose interest in the work of the councils when they find that they are met with suspicion, their advice is not welcome and their experience is not appreciated. The attitude of the local school administrators and the experience of the "outsiders" imply in such cases that councils soon only exist on paper.

5.30 Close cooperation between enterprises and vocational schools is a must and has long existed in many developed countries. Boards and councils work well together in developed countries and it must be possible to achieve the same situation in the LDC:s. But more work must go into the establishment of the LDC cooperating bodies. Their objectives, legal status, structure and working methods must be carefully worked out, fully accepted and applied even if the councils are seen as an enchroachment upon the power of the old establishment in diversified schools and vocational centres.

5.31 Staffing. Difficulties in hiring and retaining teachers is a constant theme in most reports on vocational education. There are even LDC:s where there is a surplus of teachers in academic subjects while the shortage of vocational teachers is so serious that vocational courses are not offered or only run at half capacity.

The main reason for the shortage is the comparatively low salaries. Vocational schools have to compete for staff with higher paying enterprises while academic schools have no similar competitors (para 2.05). It was once believed that an increase in vocational teacher training would remedy the situation. Many agencies supported the training of vocational education teachers, such as SIDA in Zambia and Kenya. Excellent institutions have been created. But the staffing situation in the vocational schools has apparently not improved as much as expected. Many vocational schools have continued to have difficulties in obtaining qualified teachers despite expanded teacher training and the serious economic situation in the 1970's which caused unemployment among professionals. The situation differs somewhat between countries. In the planned economy countries students are often directed to vocational teacher training regardless of career priorities in those countries. Vocational schools will have enough teachers. But the teachers' incentives to teach are not great and they will take every opportunity to get a transfer to other jobs. In countries with free market economies teacher training colleges will not have students allocated to their courses and they may end up running half full courses and the vocational schools will continue to have staff shortages. 5.32

It might be politically difficult to raise the salaries of vocational teachers without raising the salaries of other teachers and perhaps the whole civil service. Such general increases would not be financially possible. A direct increase in the salaries of vocational teachers is thus seldom possible. But there are other ways. One way is to allocate employees from enterprises on shorter assignments to the schools as teachers but still have them paid by the enterprises, with the enterprises receiving some appropriate government compensation. Another possibility is to have enterprises and schools share staff. Skilled workers and technicians could, after some pedagogical training, work part-time in industry and part-time in school. This latter method of solving the teacher problem requires that schools and enterprises are located in such a way that sharing is possible. 5.33

5.34 Staff sharing has other advantages. It provides close cooperation and links between enterprises and schools. Developments in industry, business and agriculture would be transferred from the labor market rapidly and easily to the schools. The teachers would also have the necessary practical experience. It has been almost impossible to require such experience in the LDC:s in the past, and many of their vocational teachers come directly from the teacher training colleges to the vocational schools. They have often no real labor market experience whatsoever when they enter the teaching profession. The part time teacher arrangement would solve this problem.

5.35 Teaching Methods. The most important criticism of teaching in vocational schools has been the claim that there is a wide gap between what is happening in the industrial workshop, in the office or in the field and what is done in school. The school situation is said to differ too much from the real working place. It has been claimed that outdated equipment and teaching in the schools give the students not only wrong skills but also a wrong conception of what a working place looks like and how "real" work is carried out. The criticism has often been valid. There are ways to meet it and improve the situation.

5.36 The structure, content, management and staffing of vocational education which has been suggested in this paper implies that the formal vocational schools focus on basics while the follow up training centres, closely related to the enterprises, take care of the final job-oriented training. This would automatically improve education and make it more job realistic. There are, furthermore, training methods which are being used in some countries which close the gap between the school and the workplace. One method has been applied in Cuba for years. The school combines teaching and production. A school which has a program in carpentry produces furniture for sale. An agricultural school produces grain, vegetables and animal products for sale, and so on. The "education cum work" method renders teaching more realistic as the products of the combined teaching and work must be saleable. It gives also the school profits and reduces the high costs of vocational teaching.

The "education cum work" has some risks. The profit of the economic activities must remain in the school. If not, neither the school administration nor the teachers and students have much incentive to be productive. However, on the other hand, the incentives to make money may be too strong. Production may become more important than teaching. There are examples where vocational schools have found a specific type of production so profitable that students and teachers have done little more than produce the product at the expense of teaching. As a school principal said about production in schools: "The school is a school and not a factory. Production should not be allowed to overshadow education". 5.37

Some studies also indicate that the economic value of the production should not be over estimated. The profit of the production in a school may cover 10 - 20 % of the recurrent expenditure. This is a good contribution to the finances of the school, but still a comparatively small part of the total. It is also symptomatic that the Chinese authorities have reduced the great emphasis on production work in their schools. It took too much time from teaching. "Education cum work" is thus often a good way to narrow the gap between school and work but it is not a single panacea. 5.38

What in Europe is called "alternance training" (para 2.09) is another way to make teaching more relevant to the needs of the labor market and reduce the gap between school and working place. The method implies that students share their time systematically between the school and working place in the formal vocational school, be it of the "parallel" type or a "diversified" school. In alternance training most of the theory, laboratory work and some workshop activities take place at school while a considerable amount of well organized and supervised on-the-job training takes place in the enterprises. 5.39

5.40 Alternance training can take place in any type of vocational training; industry, commerce, social services or agriculture. Time sharing can take place in several ways. The students may spend a few days at school and a few days at the working place during the last two years of a three year course (and with a similar distribution of time if he/she would be in a two or four year course). Another approach is to spend the first part of the study period in school and the last part at the place of work.

5.41 Alternance training has several advantages. It increases the possibility of offering relevant training and reduces the need for equipment in school. It can be included in the structure of a system with basic vocational education in formal institutions followed by specialized training in centres or at the working place. The less expensive equipment for the basic training would be in the school while the expensive equipment would be in the enterprises. Alternance training also facilitates the supply of teachers and lends itself naturally to teachers sharing their time between enterprises and the school.

5.42 Alternance training also has drawbacks. It is difficult to organize in remote rural areas and in agriculture. It may lend itself better to middle income LDC:s than to the poorest countries.

5.43 Two specific aspects of teaching methods in laboratories and in workshops should also be mentioned. First: progress in robotization and data processing makes it necessary for vocational education students in most subject areas to master computers. They do not have to be programmers or system developers but must be able to work on screens and handle computers and computer programs. This need has to be reflected not only in subject content but also in teaching methods which have to include the use of robots and computers. Second: simulators and simulation programs have to be developed and used in vocational education to a larger extent than has hitherto been the case. Such use will reduce teaching and equipment costs and make learning more efficient.

Several aid agencies have supported the production of learning materials, including textbooks, in vocational education in connection with the development of curricula and syllabi. ILO has also played an important role with its modular learning system. It must however be realized that students in LDC:s receive very little technical know how from their homes compared with say Swedish or American students. They often start from scratch and this fact must be reflected in the content of the learning materials. Furthermore, as much (or even more) is required of an automechanic in an LDC as in a developed country while the funds to supply necessary teaching equipment will always be scarce in the LDC. Cultural and linguistic diversities may also make it more difficult to produce a good, understandable vocational education textbook in a LDC than in such a homogeneous society as Sweden. The producers of learning materials and textbooks must not only be good technicians but also good sociologists. 5.44

The learning materials industry has so far paid less attention to equipment and material needs in vocational education than to those in general education. This might have been economically understandable in the past when vocational education comprised such a small part of the education market. It is less so nowadays. China is a case in point with its plans for considerable expansion in vocational education. There will be a need for new equipment and materials for vocational education in China during the next decade which will cost at least 8 - 10 billion USD. Similar developments with similar needs may take place in other LDC:s. The learning materials industry has every reason to become interested in vocational education and its needs of equipment, teaching aids and written materials. 5.45

External Productivity. The dimensions, objectives and content of vocational education in the LDC:s have to a large extent been based on projections of manpower needs some 10 - 15 years ahead. Projections have been detailed and have listed the needs of engineers, workers etc, sometimes down to the last individual. One type of projection was based on interviews with employers who were asked to forecast their labor needs. Another type of pro- 5.46

jection assumed a well defined relation between production and labor needs. If we take the construction industry as an example the projections were based on forecasts about future construction activities. It was assumed that so and so many thousands of cubic metres of construction work would require a certain number of civil engineers, technicians and skilled workers.

5.47 Time has shown that neither projection method was very successful. They have not maximized the external productivity of the vocational education system. The estimates sometimes exaggerated the needs. Other times the needs were much higher than the projections. Several factors contributed to these failures. The method based on interviews with employers proved inaccurate as the employers had a tendency to exaggerate their future needs of skilled labor for obvious reasons; a shortage of labor would affect their activities negatively while a surplus would be beneficial to them.

5.48 The need as expressed by an employer for a certain type of skilled labor does not, furthermore, necessarily mean that there will be an effective demand for it. It depends on the cost of labor. It has been experienced in LDC:s that a claimed shortage of skilled automechanics does not guarantee jobs for automechanics from vocational schools. The reason is that garage owners consider the salary requests of graduates inflated and impossible to accept. As a result owners continue to use unskilled labor who get on-the-job training. This may be uneconomical for the garage owners in the long run but not in the short-term perspective.

5.49 The second type of manpower projection also lacks perspectives. It is difficult to forecast new technologies and their impact on employment. How will new technologies change the total demand for labor and how will they change the composition of the labor force? What will the ratio between unskilled labor, skilled labor, technicians, professionals become? What kind of skills will be needed? None of the manpower forecasts made two decades ago could project the impact of the personal computer on the composition of the labor force in offices.

Manpower projections assume fairly strict limitations on the interchangeability of staff in an enterprise in the skilled categories. Such interchange is, however, common. Good technicians will be given responsibilities otherwise given to civil engineers if a firm is short of engineers. The technicians will, with few exceptions, show that they can do the job after some on-the-job practice. In many countries in Latin America and South Asia the reverse is true. There is a surplus of academicians and a shortage of technicians and the former perform jobs at a lower level than they have originally been trained for. These transfers are seldom included in the projections regardless of their direction. 5.50

Social and private rate of return calculations are other tools which have been suggested to estimate the external productivity of vocational education. Skills with high rates of return on investments in vocational education would indicate demands and needs, and training opportunities should be offered in those sectors. Other types or levels of education with lower rates of return should not be invested in. 5.51

Rate of return calculations have not been widely used in actual operations in the LDC:s although they provide some good general understanding of how education works. Studies showing the high rate of return of primary education as compared with other levels of education in LDC:s which have not yet achieved universal basic education have proved useful and speeded up efforts to universalize education in those countries. But the method suffers from shortcomings which reduce its use for education planning. 5.52

The most important shortcoming of the rate of return calculations is that they use labor costs and salaries as proxies for productivity. The calculations also disregard the fact that the cost of training of, say, a machine operator will always be higher than the training of, say, a typist and that consequently the rate of return on the investment in the training of the former will be lower than the return on the investment in the training of the latter, almost regardless of the salaries given. 5.53

The same is true for many other occupations. Civil service salaries are inflated in some countries while they are too low in others. This could also give wrong signals to the planners about the need to invest in the training of civil servants. Salary levels inflated by strong unions or the fact that some professions are better paid because the job is dangerous or unpleasant reduce also the usefulness of rate of return calculations. They lose value in economies where income equality regardless of education or job productivity is the official policy. It is particularly dangerous to use rate of return calculations in societies with planned economies where salaries often bear very little relationship to productivity.

5.54 If we apply to secondary education what has been said in para 5.53, it could be claimed that high rates of return of investments in general secondary education as compared with low rates of return in vocational secondary education would only tell us that skilled workers are underpaid while white collar workers are overpaid. Others would claim that rate of return calculations can be used to guide investments in secondary education only in a very general way as long as salaries reflect much more than productivity. Some skills are needed whatever the rate of return calculations might say about their profitability. We conclude this review by suggesting that rate of return calculations provide potentially useful information on external productivity in education but must be used with great care and not as the only planning method.

5.55 Developed countries with free market economies may offer vocational education based on social demand. The schools offer places according to the number of applicants. This assumes a kind of private rate of return calculation made by the consumers of education. It is feasible to run vocational schools based on social demand in commercial education where the capital costs have been low. Consequently small private business schools have flourished together with public business schools both in LDC:s and developed countries. This is difficult and expensive in other sectors.

As a result industrial schools and agricultural schools in free market economies are either run by the public or by major enterprises; and almost never according to social demand but according to assumed labor market needs or to what the community can afford to provide.

Farming is primarily a female occupation in several LDC:s. Neither manpower estimates nor rate of return calculations have successfully come to grips with the specific issues this fact raises. As a consequence the training of farmers in LDC:s has often been irrelevant in the sense that it has trained male students who have never gone into active farming themselves. The objectives, structure, content and staffing of the agricultural schools might have been right but the external productivity has nevertheless been low as the schools have trained the "wrong" students. 5.56

Studies to trace the employment of vocational school graduates should be carried out as a matter of routine in order to estimate external productivity and facilitate manpower projections. Did the graduates get a job, what kind of job, what income? How long did they have to wait for a job? Did they work in the sector for which they were trained? How mobile have they been? Tracer studies have been introduced in several developing countries during the last decades but they have seldom been followed by the authorities up to the extent they deserve and their findings have not been exploited to the extent they should. Many authorities have not fully realized the usefulness of these tools in education planning and decision making. Tracer studies have to be well prepared and require trained staff for execution. The close involvement of the school from which the graduates come is helpful. 5.57

Vocational guidance at school, primarily conducted by specialists, is mentioned as a means to help students to obtain good jobs after graduation and thereby improve the school's external productivity. The students would, with the aid of the counsellors, make a better choice of study programs to fit aptitudes, 5.58

attitudes and skills and in this way would increase their employability. As a consequence many studies suggest the establishment of career guidance programs with special counsellors in the vocational schools. The studies are, however, rather vague about the impact of such programs. There are some indications that the part time teachers, (part time school - part time enterprise) would do just as good a job of counselling. They have a closer contact with the labor market and the student than the specialist counsellors. There are also reports which refer to the advisory councils as important guidance bodies.

5.59 Professional counsellors appear justified in traditional vocational schools with no organized links with the labor market and with teachers who have little knowledge of industries and other enterprises in the area. The use of professional counsellors is more questionable in LDC schools with advisory councils and with teachers who themselves have some connection with the enterprises. The use of professional counsellors will increase the recurrent costs of schools which are already high. It has also been claimed that their existence makes ordinary teachers relinquish some of their natural responsibilities towards students.

5.60 Tests and examinations are related to both the external productivity and the internal efficiency of education. They are justified in vocational education in the LDC:s for two reasons. Firstly, they help to assess, raise and maintain education quality. Secondly, they constitute so far the most equitable method of selecting students, passing them through the education system and channelling them to the right jobs in the labor market.

5.61 One problem in vocational education is to make tests and examinations relevant to the skills and knowledge which vocational schools are primarily supposed to provide. It is easier to test academic than vocational skills. An examination in a vocational school which tests academic rather than vocational skills may be worse than no examination at all. Even in developed countries

appropriate examinations and evaluations of vocational education achievements have been slow to come. Exceptions are the "city and guild" types of test which, at least until recently, have dealt with traditional skills and reflected to a lesser extent new technologies in industry, commerce, transportation and agriculture. The education research community has shown less interest in performance assessments and tests in vocational education than in general education. No international research in vocational education similar to the research in general education as conducted by the International Association for the Assessment of Education Achievement has been performed.

Where does this discussion on the external productivity of vocational education in LDC:s lead us? It suggests a continued use of manpower estimates but with a much reduced objective and scope. Indicative directions by major type of occupation should be given without any specific time perspective instead of detailed 10 - 15 year estimates. The projections should be continually updated and revised using tracer studies, rate of return calculations and other signals from the labor market. The enterprises should be requested to provide more realistic information about their needs than has generally been the case so far. Due consideration should be given to the current and future technological levels of enterprises in the LDC:s which may differ considerably from those of the enterprises in advanced economies. Consideration should be given not only to preservice but also to inservice training needs. The role of women in the labor market - in agriculture and also in other economic sectors - should be given due attention. The short-term projection, which might well change from year to year, would require flexibility in the vocational education and training system which has already been advocated in this paper for other reasons. The suggested close link between the post-secondary follow-up training in vocational training centres and the labor market would also be appropriate for this purpose. Finally, few LDC's could run their vocational education systems based on social demand (with the possible exception of traditional urban commerce schools). 5.62

5.63 Internal Efficiency. Some recent studies by the World Bank and SIDA review various aspects of the internal efficiency of vocational/diversified education. Otherwise few multilateral or bilateral agencies have paid much attention to the internal efficiency of vocational schools. This lack of attention is also true for the research community. Educators have researched student performance and the factors which influence this performance but they have focused on general education and shown little interest in the cost of changing performance. Education economists have been interested in costs but more at the macro than at the micro level.

5.64 Efficient staff utilization is important in vocational schools where many staff specialities are needed regardless of the number of students. This need easily leads to expensive underutilization. Staff utilization practices vary among schools and countries. It is not uncommon to find that a teacher in one country has 25 - 40 class-contact hours with the students in a specific subject in a vocational school while he would have only 10 - 20 contact hours teaching the same subject in another country at the same type of school. There is no rational explanation of this large difference. It probably reflects just teaching tradition and nothing else. Class sizes also vary a great deal among countries with no good reason for the variation. Again a small class size does not necessarily guarantee high student performance. A low teaching load and a small class greatly increase the recurrent costs, and prevent the use of scarce money for other purposes in the school.

5.65 Space utilization also varies much among countries and schools. The low utilization of laboratories and work shops is particularly critical as they constitute expensive facilities. There are vocational schools where facilities are well used from 8 o'clock in the morning to 10 o'clock in the evening. There are other schools where laboratories and work shops are only used in the afternoons as "the more demanding theoretical subjects should be taught in the mornings when students are most alert".

Student alertness is important but not even the most affluent country can afford such underutilization of school space. Non-formal industry-related institutions often do better than formal schools. The paradox is that low staff and space utilization in vocational schools appears most common in countries which can least afford it.

There is a need for an improved analysis of staff and the use of facilities in vocational education. A useful aid in an analysis of staff and facilities utilization is the form used by the World Bank (Educational Worksheet) attached to this paper (Annex 1). 5.66

Other aspects of internal efficiency such as student retention and attrition are generally well dealt with in evaluation reports and research studies. A cohort analysis, using the form which Unesco developed several years ago (Annex 2), is helpful. It is also useful to review the composition and use of the teaching staff in the vocational system or in individual schools (see form, Annex 3). When completed the forms (1-3) will reveal issues and weaknesses in the vocational education system and comprise a good basis for discussions between aid givers and aid recipients. * 5.67

Costs. Capital costs of vocational schools are considerably higher than those of general, academic schools. The nigher costs are caused by the large number of laboratories and workshops needed. The World Bank has studied the cost of buildings and equipment for academic, vocational and communal facilities in World Bank financed projects over the years. The table below shows the costs as related to those in primary schools per student place. They exclude costs for dormitories and staff housing although such facilities are common in vocational schools in some LDCs and would make costs per student place even higher. The table refers to projects financed by the Bank during 1970 - 1983. 5.68

* A recent (1986) World Bank Publication called "Evaluating Vocational Training Programs" provides comprehensive assistance in efficiency analysis.

Primary schools	1
General secondary schools	5
Vocational secondary schools	12
Vocational post secondary schools	16
Universities	36

A vocational secondary school place is thus 2.4 times more expensive than a place in a general secondary school.

5.69 The World Bank has not published similar tables for recurrent costs but they may be estimated with some accuracy. The demand for teachers is higher in vocational schools than in academic schools even where the teaching duty is reasonable (20 - 25 periods per week in theoretical subjects and 30 - 40 in workshop practice), as classes in workshops and laboratories must be comparatively small. The teacher density is about twice as high in vocational subjects as in theoretical subjects. The costs for consumables and learning materials is also higher. The following table shows relative recurrent costs per student using primary education as the unit.

Primary schools	1
General secondary schools	3
Vocational secondary schools	6
Vocational post secondary schools	8
Universities	25

The recurrent unit costs of vocational education are twice as high as those of general education at the same level.

5.70 The tables in paragraphs 5.68 and 5.69 illustrate the dilemma of vocational education. A vocational school graduate is twice as expensive as an academic school graduate. His skills are, however, needed just as much. It is not possible to dispose of them because of high costs or "low rate of return". However, less expensive ways of training must be found. Some World Bank studies indicate that institutions closely related to industries show a higher rate of return than traditional vocational schools. The

capital and recurrent costs might be reduced by the suggested higher involvement by enterprises and by the integration of the practical training as much as possible with the enterprises. This could happen both through the alternance education in the formal schools and the increased emphasis on nonformal training.* Close attention should also be given to the possibility of using the new technologies (computers, simulators) in teaching with a view to obtaining improved performance simultaneously with a reduction in costs. However, a technician or a skilled worker will probably remain more expensive than an academic school graduate.

Annex 4 can be used for the analysis of the recurrent costs of a LDC vocational school or system. The analysis often reveals an underfinancing of materials, consumables and maintenance, and confirms the statements made in para 2.06. It was also mentioned in para 2.06 that many education authorities do not fully realize the costs of high quality vocational education. They underestimate both capital and recurrent costs. In such cases the aid donors should hold very thorough discussions on unit-costs and show how changes in class sizes, in staff utilization, in space utilization, in teaching methods and in school administration have a considerable impact on costs. A former secretary of education in an OECD-country once remarked that even very comprehensive education reforms are inexpensive compared with the costs of maintaining uneconomic class sizes, low teaching duties and poor space utilization. Recurrent cost financing of LDC vocational schools by aid agencies could serve as a means to achieve increased cost effectivness in those schools. 5.71

Financing. Public vocational schools are often underfinanced. This is less true for schools and training centres run by industries or enterprise organisations. Industries and enterprises have an obvious interest in ensuring that schools and centres run by them are not underfinanced. The way such centres are being financed, e.g. in Latin America, is a major explanation of the difference. 5.72

* Few dispute the need of the higher involvement but some researchers doubt that cost reductions will occur.

5.73 In many Latin American countries and in some European countries payroll taxes are being used to finance inservice and preservice training organized by enterprises or organisations which in this way get their tax money back. Payroll taxes may also be used to finance other types of vocational training. The experience of using payroll taxes to finance vocational education is thus good although some economists claim that payroll taxes work as a disincentive for LDC enterprises to use labor intensive technologies. Payroll taxes have been used with particular success in training for industry and commerce. This system may work less well in agriculture, where enterprises paying payroll taxes might be few, at least in some LDC:s. It is also difficult to use the system to meet the training needs of artisans and the nonformal sector.

5.74 Some vocational education may be financed through fees. It is possible to use fees in inservice training where fees would be paid by enterprises which send their employees to the schools for upgrading or retraining. Fees for inservice training may also alternatively be paid by students who are generally adults with an income and expecting higher salaries on completion of the training.

5.75 The fee situation is different in those formal vocational/diversified schools which provide basic vocational secondary level education or in the follow up preservice post secondary training centres. Vocational programs have often had difficulties in recruiting students - the private rates of return may be low and students often come from low income families. These factors speak against fees. Student fees in vocational diversified schools cannot therefore be suggested. The formal vocational schools, however structured, would therefore have to rely on traditional state and municipal taxes for their financing. The same arguments can be used against fees in the follow up preservice training centres. Preservice centres which are closely related to enterprises may well be financed through payroll taxes. Other centres not so directly related to enterprises and training farmers, artisans and personnel working in small enter-

prises etc may have to depend on the same taxes as the formal vocational schools and cannot regularly charge fees or benefit from payroll taxes.

Research. As stated above, there has been less research in vocational education than in the rest of the education system. The vocational education agencies of many LDC:s may have lacked satisfactory cooperation with the labor market but their cooperation with the international and national research community has been even less developed. Efforts must be made to increase the contact between vocational education and research. First and foremost indigenous universities should be used for this research. Some areas which need research are: 5.76

i) The external productivity and internal efficiency of various modes of vocational education. Recent World Bank studies on Colombia, Tanzania, Subsaharan Africa and Korea comprise a start and answer some questions on external productivity and internal efficiency. More must be done, particularly in the comparison of apprenticeship schemes, on-the-job training and formal school training. The studies must also cover education in sparsely populated areas.

ii) The cost effectiveness of various instructional methods in vocational schools where teaching methods, staff and space utilization etc are concerned.

iii) The financing of vocational education. Here self financing schemes such as those initiated by ILO in Asia and East Africa (SDSR and TRUGA) should be reviewed.

iv) Agricultural education (reflecting that agriculture in many LDC:s is a female occupation while extension and training efforts have mainly reached males).

FINDINGS 6

Vocational Education Projects

The last part of the paper will report on experience gained in vocational education, project identification, preparation, execution, evaluation and results. Several of the 200 projects which 6.01

have been reviewed have done well and contributed positively to the establishment of viable vocational education systems in the project countries. Nevertheless, many issues still exist which confirm the reports of the studies reviewed in the previous sections of this paper.

6.02 Project Identification. Most vocational education projects have been identified through manpower estimates and manpower projections with their shortcomings as discussed above (paras 5.46 - 5.58). There has been an overemphasis on formal public schools and an underemphasis on nonformal enterprise-related training institutions in the projects identified and suggested. Major aid givers are public agencies as are their counterparts in the LDC:s. The former are in a better position to discuss public than private schools and training centres. The latter are just as naturally more interested in receiving support for their own public schools and less interested in support for private institutions. This imbalance must be rectified if the main thrust of this paper - an economically mixed vocational education system with high external productivity and high internal efficiency - is to be achieved.

6.03 A second issue is that the identification has not covered the training needs of the large nonformal economic sector (artisans, small enterprises, etc). More attention has also, until recently, been given to the urban than to the rural sector. Those few exceptions which exist reflect the interest in rural development of recent years. A reason for this imbalance has been the difficulty in identifying and designing appropriate projects for the nonformal and rural economic sectors.

6.04 Reports from ILO, the World Bank and FAO state that the training needs of women have often been overlooked. The ILO report claims that much project identification has also taken place without the involvement of employers and employees (cf para 5.28 on "tripartite" cooperation). Recent ILO projects (TRUGA, SDSR) have tried to come to grips with this problem and major field interviews are conducted prior to starting the training.

Project design, preparation and execution. There are three decades of experience of vocational projects but this experience has not been as well utilized in project design, preparation and execution as could have been expected. Many vocational education projects have been designed, prepared and executed jointly and in close cooperation by aid donor and recipient often with considerable financial and manpower assistance. However, problems have occurred. 6.05

The most striking observation is a constant time overrun. Vocational education projects are generally planned to be executed, fully completed and handed over to the aid recipient in 3 - 5 years. The real execution time is rather 7 - 8 years or often a 100 % time overrun. Even an agency such as the World Bank has found that only 10 % of its education projects have been completed on time. 6.06

The project designers have been too optimistic about the time needed to hire staff, to produce new curricula and syllabi, to draft equipment lists and procure equipment and to organize fellowship programs. Delays in civil works exist also and have been most common in projects in nonformal education. 6.07

Weak project execution units are quoted as causes of project delays. Low salaries and little decision-making power have caused under-staffing and high staff turnover in units staffed by nationals. Units mainly staffed by expatriates have suffered from slow recruitment and staff turnover blamed on agency bureaucracy. 6.08

Time overruns have led to cost overruns. Total staff needs will increase and building costs go up because of inflation which has been high in most LDC:s during the last decades. The costs will also increase indirectly as the vocational institutions to be established through the projects will not be able to start their training as originally planned. The labor market will have to wait a few more years for the graduates from the project institutions. 6.09

6.10 Attempts to reduce cost overruns by changing project composition have often meant that funds have been transferred from software and technical assistance to hardware and building construction. Such transfers may be politically opportune as new buildings are more spectacular than new curricula but may imply a change of project objective and have serious consequences for the performance, outcome and impact of the project. Good software is often more critical for project success than hardware but is also under normal circumstances given less attention than necessary. The transfers among project items which occur when cost overruns are imminent threaten the successful outcome of projects.

6.11 The most frequent execution problems are:

i) time overrun,
ii) cost overrun,
iii) project execution units,
iv) maintenance,
v) equipment.

6.12 The overall recommendations which emerge from the evaluation reports are

i) vocational projects should be simple without too many diverse components and they should be administered by as few Government agencies as possible,
ii) execution periods and cost estimates must be more realistic,
iii) execution units should be strengthened.

A major ILO report suggests, also, that projects should be more systematically followed up after project completion. * This follow up would provide information on the long term government commitment, the quality of the technical cooperation and infor-

* Bilateral agencies appear to follow up projects better and more systematically than agencies such as the World Bank.

mation transfer, the adequacy of staffing and recurrent cost financing, and finally the external productivity and internal efficiency of the project after the full handing over of the project to the national agencies. Most project evaluations are conducted so soon after the completion of buildings and other hardware and the formal opening of the project institution that it is too early to obtain answers to most of the above questions.

Results of Vocational Education Projects. A World Bank study reviewed a large number of vocational projects assisted by the World Bank and reported that: 60 % of the projects had a good outcome while 40 % had problems, particularly in enrollment and equipment. The formal vocational and technical schools were said to be doing well in middle income LDC:s while they faced problems in low income LDC:s particularly in Africa. There were comparatively more problems in diversified schools and 85 % of the reports on African projects discussed issues in diversified schools although in other more advanced areas of the world the diversified schools did better. 6.13

The Bank assisted vocational education projects including both formal and nonformal institutions. There were comparatively more execution problems with the nonformal institutions. One report stated that neither donor nor recipient knew enough about nonformal vocational education to design and execute such a project well. Other reports on nonformal vocational education refer to insufficiently defined training objectives, unclear target groups, loose administration, too many agencies involved, insufficient funding, and so on. The nonformal education projects have also often included more software than hardware and received less attention than they needed during the project execution. 6.14

The less successful outcome of the nonformal education projects does not mean that they do not correspond to a need. In fact they were often needed much more than many formal education projects. But the outcome reflects a deficiency in project preparation and execution. Enterprises, employers and employees which could have 6.15

helped to identify, prepare and execute nonformal vocational education projects were not sufficiently involved. It was also found that school managers and agencies who were asked to handle both formal and nonformal activities generally paid more attention to the former than to the latter.

6.16 It has been suggested in this paper that future vocational training systems in many LDC:s should comprise basic preparatory vocational education in close integration with the rest of the formal system to be followed by flexible nonformal vocational education which should be closely related to enterprises and the labor market. The upper part of this system, the nonformal sector, should be given as much attention by the donor as the formal lower sector. It is therefore disturbing that nonformal education projects have so far not been so well executed than formal education projects. This has to be changed. It is easier to execute formal education projects managed by public agencies than nonformal projects managed by semiprivate or private bodies but this should not be an excuse for not working where the most urgent needs exist.

6.17 Most evaluations have been conducted so early after project completion that little is known about the employment of the school graduates. The employment rates are high in those cases where data exist - higher in vocational schools than in diversified schools. 16 World Bank evaluations report good employment while none reports serious unemployment. These findings may seem to contradict research findings by the same agency and what has been said in previous parts of this paper. It is probably not so. It may be expected that graduates from schools when equipped and staffed through external assistance and therefore with high status, would have much higher employment rates than an average vocational school. The statements made the evaluation reports are, furthermore, seldom based on comprehensive tracer studies but more on general assurances by the school staff. A German evaluation study raises a question in this context. Are vocational schools financed by external agencies of such a high

quality that they can never be duplicated and serve as a model for other schools? Are they green oases in an otherwise desolate desert? Such risks exist. The issue is difficult. Architects and educators representing aid donors have occasionally ended up in sensitive discussions with their LDC counterparts about the quality of buildings and equipment. Suggestions to simplify buildings and provide less expensive equipment have not always been accepted. There have even been references to "colonialism" when donors have suggested schools less costly than those in the donor's country. It may also take more effort to train an auto-mechanic or an electronic engineer in a LDC than in a developed country and better staff and equipment would in such cases be required (cf. para 5.44). But the money available in the LDC may be 30 % or much less than that available in a developed country and still mean that the LDC is devoting relatively more money from scarce resources (as measured as a percentage of GNP). A way to solve this dilemma, which is acute in vocational education, would be for aid donors to finance both the capital and recurrent costs of vocational education (para 5.71).

6.18 It was generally believed in the 1960's and 1970's that the need of technical assistance in education projects in the LDC:s would rapidly diminish. This has not been the case. With a few exceptions the need has remained or increased. Vocational projects have developed with time and become more complicated. The content of education in the vocational programs has become more comprehensive. This has required more technical assistance. A trend in technical assistance can be observed. There is less need for long term experts and an increasing need for well qualified experts on shorter but repeated visits.

6.19 Vocational education projects have increasingly included the development of curricula, production of learning materials and assistance to vocational education planning. Technical assistance experts have to a large extent been involved in these jobs. Their work with software has been said to contribute to institution building. An ILO report states that most LDC:s now have the

structures to meet the training needs in vocational education and management training. A World Bank report claims that the institution building outcome of the technical assistance work has been more important than the actual production of curricula, learning materials, etc.

6.20 The outcome of technical assistance is generally positively assessed in the evaluation reports. But issues surface. Some reports claim that the delayed hiring and late arrival of experts has not only delayed project execution but also reduced project impact. The experts should also be better integrated in the project execution units and their terms of reference better defined.

6.21 Many vocational education projects have formed part of education reforms. The agency staff working on these projects might have conducted a good technical analysis of the need for expanded vocational education or some kind of diversification. But two important questions have sometimes not been asked

i) is the political situation conducive to a reform of the type suggested?
ii) has the country reached the stage of development when the proposed reform is appropriate (para 5.12)?

An answer to these two questions would have shown that some school reforms which were supported by outside aid agencies in some African and Latin American countries would fail and that the project funds therefore would have little impact.

6.22 Many vocational education projects have included studies to be undertaken. Tracer studies have been mentioned. There is a consensus among evaluators that many studies suggested by donors have been accepted by the recipients primarily to comply with the wishes of the donors but without much enthusiasm. As a consequence some studies have been executed half heartedly or not at all. Other studies have been conducted as they should, but the findings have neither been discussed nor applied. The proponents of the studies have not been successful in selling

the usefulness of the studies to those concerned. This is a pity as with the benefit of hindsight most of the studies would have met urgent needs in vocational education.

Donors have vocational systems in their home-countries which may differ considerably. It is therefore important that these donors, when working in one and the same LDC and offering assistance in vocational education, coordinate their efforts and avoid offering systems and solutions completely at odds with each other. Such cooperation is particularly important in vocational education which is expensive and complicated even under the best circumstances. 6.23

Summary. A summary of the evaluation reports indicates that 6.24

i) There is a positive correlation between a country's economic development level and the success rate of vocational education projects, as would be expected. Projects in East Asia do better than projects in Latin America and in the Mediterranean area which do better than projects in Subsaharan Africa and South Asia. This might indicate that the latter continents should have more technical assistance in project work than has been provided.

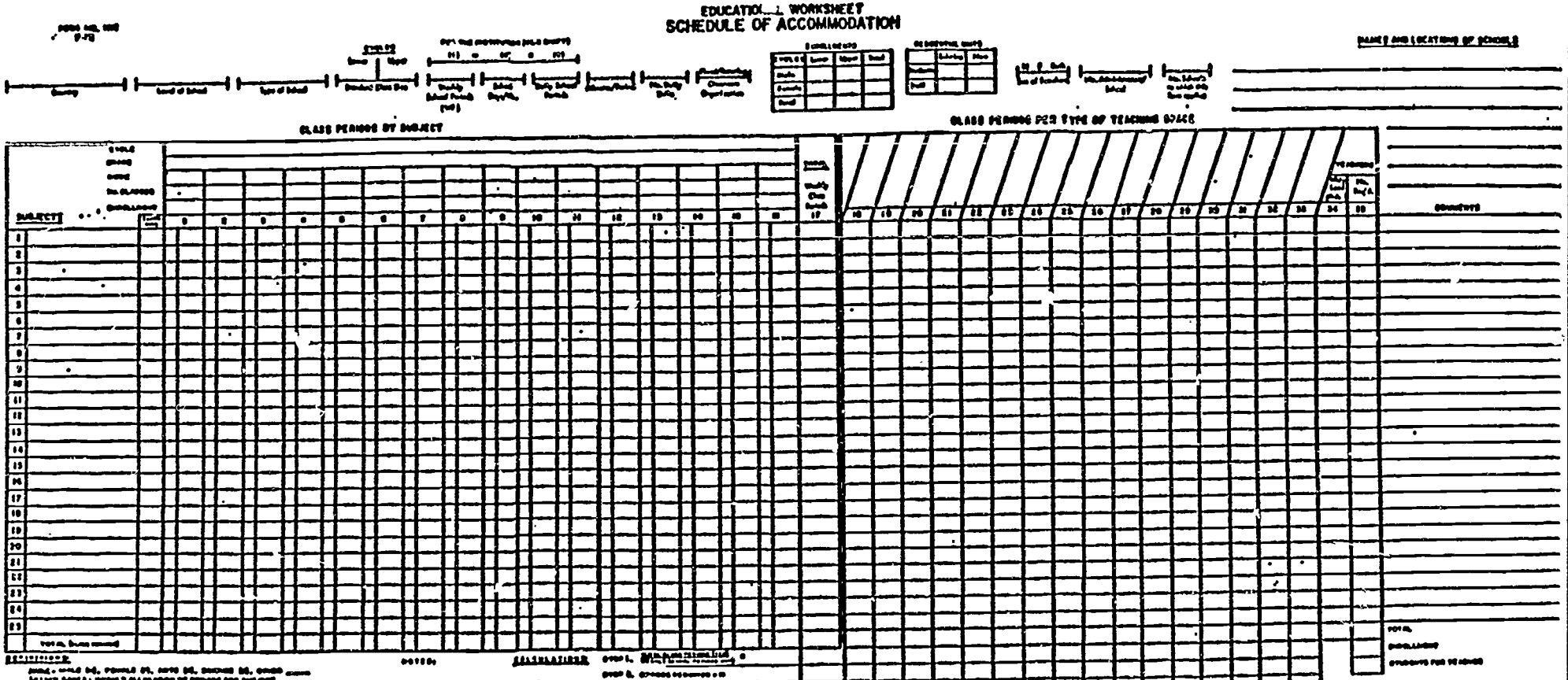
ii) There is a need for more attention to nonformal enterprise-related vocational education projects which, with the possible exception of ILO administered projects, have done less well than projects in the formal vocational education sector. Diversified education projects have often been introduced too early and without enough preparation.

iii) Software components are more difficult to execute than hardware components. The former have been given insufficient attention but have, when taken into consideration, had a good outcome with considerable institution building. Software project components will be increasingly important and should be given a great deal of attention and supported with technical assistance.

iv) Studies and research have been included in many projects but have not been well utilized. There will be a continuous need of studies and research in vocational education which so far has been under researched. More attention should be paid to the use of research findings.

EDUCATIONAL WORKSHEET

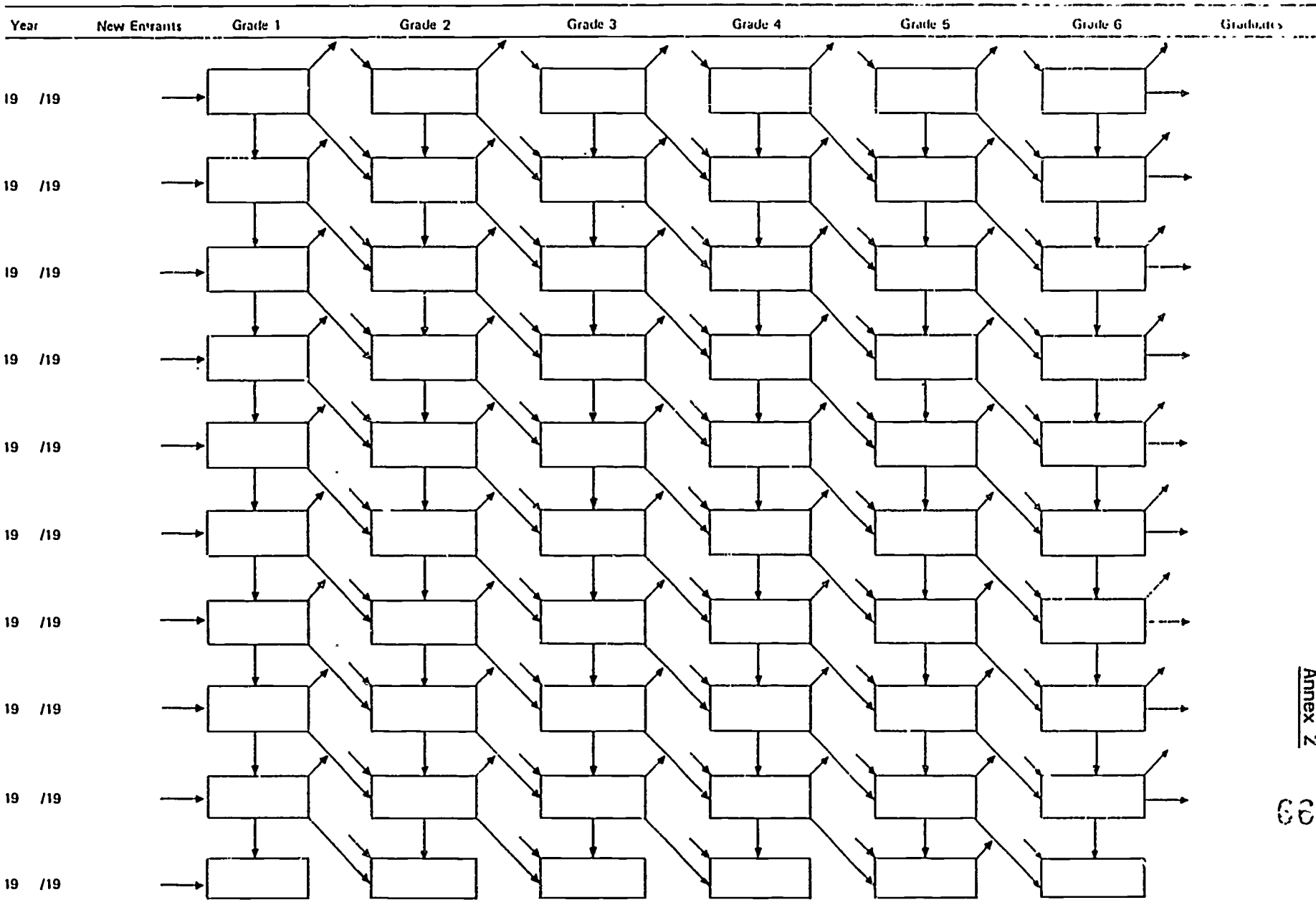
SCHEDULE OF ACCOMMODATION



STUDENT FLOWCHART

INTAKE, ENROLLMENT, REPETITION, DROPOUT, GRADUATION IN SCHOOLS AND COLLEGES

NAME OF SCHOOL (PROVINCE, COUNTRY): _____



Annex 2

ED. SECTOR
IBRD

ANALYSIS OF TEACHING STAFF BY SUBJECT AREAS

Teachers in _____ Schools (Colleges)

Academic year_____

Name of School:_____
(Province, Country)

Teaching Subjects 1/	Total Number of Teachers per Subject or Families of Subjects	BREAKDOWN OF TEACHING STAFF															
		By Length of Schooling (years) (Including Teacher Training)								By Industrial, Agricultural Commercial Practices in Years				By Length of Teacher Trg. in Years			
		≤10	11	12	13	14	15	16	>16	≤1	2	3	>3	≤1	1	2	>2
Total number of teachers																	

1/ List Subjects or Families of Subjects

ANALYSIS OF EDUCATION RECURRENT EXPENDITURES AND REVENUES

Name of School: _____
(Province, Country)
Type of Education: _____

	Recurrent Expenditures _____fiscal year	Recurrent Budget _____fiscal year
Salaries 1. Administrative Staff 2. Teaching Staff 3. Caretakers, kitchen staff, drivers, etc.		
Recurrent Materials directly Related to Instructional Facilities 1. Consumable materials in classrooms, laboratories, workshops 2. Books and other reading materials 3. Learning equipment 4. Other consumables		
Recurrent Materials not directly Related to Instruction 1. Boarding equipment and food, etc. 2. Transportation 3. Maintenance of buildings and facilities 4. Public utilities		
TOTAL		
Average per student cost in teacher salaries:		
Average per student cost in total school budget:		
	Revenues _____fiscal year	Projected Revenues _____fiscal year
Revenues From Central Government		
From Local Authorities		
From Fees		
From Parents' Contribution		
Donated from Industry		
Other Sources		
TOTAL		

Vocational Education in Developing Countries

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13. European Institute of Education and Social Policy. New Information Technologies and Technical Eudcation - Hague 1984

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21. ILO. Cinterfor, Ducci: The Vocational Training Process in the Development of Latin America - Montevideo 1980

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Vocational Education in Developing Countries

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