

**VOCATIONALIZED SECONDARY EDUCATION REVISITED**

**JON LAUGLO  
ALBERT K. AKYEAMPONG  
KILEMI MWIRIA  
SHELDON G. WEEKS**

**24 December 2002**

**Prepared for  
Regional Vocational Skills Development Review  
Human Development  
Africa Region  
World Bank**

## Preface and acknowledgements

The study has been a collaborative venture with different responsibilities for each of us. Part One has been written by Jon Lauglo (World Bank). It makes use of the country case studies prepared by the other team members and has benefited greatly from comments made by the other team members on an earlier draft. Part Two consists of three country case studies respectively authored by Kwame Akyeampong (University of Cape Coast): Case study on Ghana; Kilemi Mwiria (Kimkam Development Consultants, Nairobi/Bonn): Case study on Kenya and Sheldon Weeks (BEST-Evaluation Service Team Botswana): Case study on Botswana. In the text, these three case studies will respectively be referenced as **GCS**, **KCS**, and **BCS**.

To those who are familiar with research in the 1980s on vocationalized secondary education, there will be no sensationalism in what we conclude about cost and implementation, in the present review. As the work progressed, it became increasingly apparent that hardly any studies have, since the 1980s, addressed the key question of impact of vocationalization. We have thus had to rely heavily on older research on this issue.

Neither the general report nor the case studies should be interpreted as official views of World Bank, or the Ministries of Education in the three countries, but of the authors concerned.

The authors wish to acknowledge the courtesy and help given by all persons and institutions consulted in Botswana, Ghana, and Kenya. We also appreciate the valuable comments on draft manuscripts received from the reviewers: Kenneth King (Edinburgh University) and Jacob H. Bregman (the World Bank).

We are thankful for grants from the Norwegian Education Trust Fund, and from DFID; and we value greatly the collaboration extended by UNEVOC in publishing the report jointly with the World Bank.

Washington/Accra/Nairobi/Gaborone  
December 2002

Jon Lauglo  
Albert K. Akyeampong  
Kilemi Mwiria  
Sheldon G. Weeks

## PART ONE—GENERAL REPORT

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2</b>	<b>STARTING POINTS</b>	<b>3</b>
<b>2.1</b>	<b>Rationales for vocationalization</b>	<b>3</b>
2.1.1	Personal development goals	3
2.1.2	Socio-political goals	3
2.1.3	Economic goals	4
<b>2.2</b>	<b>Previously noted constraints</b>	<b>4</b>
2.2.1	General constraints	4
2.2.2	Constraints on economic relevance	5
2.2.3	Constraints on personal development goals	5
2.2.4	Constraints on socio-political goals	6
<b>3</b>	<b>FINDINGS</b>	<b>6</b>
<b>3.1</b>	<b>Policies driven by search for economic relevance</b>	<b>6</b>
<b>3.2</b>	<b>Implementation issues</b>	<b>8</b>
3.2.1	Program preparation and resourcing	8
3.2.2	Curriculum structures	9
3.2.3	Workshops, equipment, materials	10
3.2.4	The supply of teachers	11
3.2.5	Uneven starts in teaching ICT skills	12
3.2.6	Assessment of learning	14
<b>3.3</b>	<b>Implementation-related issues of concern</b>	<b>15</b>
3.3.1	Are vocational/practical subjects doomed to have low-status?	15
3.3.2	Gender inequity	18
<b>3.4</b>	<b>Cost</b>	<b>19</b>
3.4.1	Kenya	20
3.4.2	Ghana	21
3.4.3	Botswana	22
<b>3.5</b>	<b>Outcomes and impact</b>	<b>23</b>
3.5.1	Learning outcomes	23
3.5.2	Do attitudes need improving and does vocationalization improve them?	23
3.5.3	Does vocationalization lead to interest in self-employment?	24
3.5.4	Does ‘enterprise education’ prepare for entrepreneurs?	25
3.5.5	Does vocationalization ease transition to work?	26
3.5.6	Does it lead to related training or higher education?	29
<b>4</b>	<b>CONCLUDING OBSERVATIONS AND RECOMMENDATIONS</b>	<b>31</b>
<b>4.1</b>	<b>Observations</b>	<b>31</b>
<b>4.2</b>	<b>Recommendations</b>	<b>33</b>
4.2.1	Is vocationalization advisable?	33

4.2.2 Process skills matter	34
4.2.3 Criteria for choice of practical/vocational subjects	34
4.2.4 The special case for ICT skills	34
4.2.5 General implementation advice	35

<b>REFERENCES</b>	<b>36</b>
-------------------	-----------

**TABLES**

1 Approximate proportion of weekly timetable devoted to vocational subjects in the three countries	9
2 Estimated costs of science laboratory and workshop in five Kenyan schools	20
3 Ratios of estimated capital costs per student place in Kenya in 1985	20
4 Teaching costs per student period for technical subjects and agriculture across three schools in Ghana	21
5 Ratios of estimated subject cost in Botswana	22

**PART TWO COUNTRY CASE STUDIES**

**PRE-VOCATIONAL EDUCATION IN BOTSWANA** **Botswana Case Study - 1**

**VOCATIONALIZATION OF SECONDARY EDUCATION IN GHANA** **Ghana Case Study - 1**

**VOCATIONALIZATION OF SECONDARY EDUCATION IN KENYA** **Kenya Case Study - 1**

## PART ONE. GENERAL REPORT

### 1. Introduction

Vocationalized secondary education refers to curriculum elements of a vocational or practical kind which are introduced into a secondary school curriculum that remains dominated by general education subjects. Closely related terms are ‘diversified curriculum’ (Psacharopoulos 1985), ‘work orientation’ (Hoppers 1996), ‘practical subjects’ (Lauglo 1985), and ‘pre-vocational education’ (education especially earmarked as preparatory for VET).<sup>1</sup>

The scope of this study is confined to the kind of vocationalization which comes in the form of ‘subjects’. This is the usual form that vocationalization takes. Traditional examples are handicrafts, industrial arts, agriculture, domestic science, and accountancy or other skills relating to business and commerce. At present courses in computer applications show fast growth even if, in nearly all African countries, implementation has only been achieved in a very small proportion of schools. The main purpose of vocationalization is to improve the vocational relevance of education. However, it is recognized that other means can also be used by schools to this end. A more practical and applied way of teaching general education subjects can also improve the relevance of education for work. Guidance counseling and study visits are other examples.

*Vocationalization contrasts with vocational education and training (VET)<sup>2</sup>, in that under the former type, most of the students’ timetable will consist of general education subjects. Thus, a distinctive feature of vocationalized secondary education is the fact that the subjects concerned are a minor component of the total curriculum followed by each student. This means that the student can usually also pursue a load of general education subjects of the ‘academic kind’ which will suffice to keep open the possibility of qualifying for higher stages of academic education.<sup>3</sup>*

Vocational subjects and courses will usually also have some general education objectives. But the focus will be on the relevance for economic activity. The goal of improving such relevance of curricula in mainstream schools is the most important reason why governments have sought to introduce vocationalization in curricula which remain dominated by general education subjects.

Vocationalization has been a recurring theme in education policy debate in developing countries. In Africa this debate dates back to colonial times. Following

---

<sup>1</sup> Compared to VET, the recently coined concept of ‘skills development’ would be wider – more inclusive of any skills which are useful for making a living—not only those which are transmitted in formal education and training programs and not only those which are earmarked for particular occupations.

<sup>2</sup> ‘Vocational *education*’ has stronger connotations of personal development and wider scope of what is to be learned. ‘Vocational *training*’ has stronger connotations of learning skills that have been more concretely specified and can also be applied about more minor events—e.g., training in how to service a new carburetor. However, in practice the two terms are strongly overlapping, and usage varies among agencies and countries.

<sup>3</sup> Timetabling of subjects may sometimes block this possibility. This can happen in Botswana.

studies and literature reviews in the 1980s which presented discouraging findings on the effectiveness of vocationalization<sup>4</sup>, many international agencies and governments came to distance themselves from the pro-vocationalization policies which they previously had favored. The special priority given to primary education since the early 1990s has also until recently deflected donor interest from secondary education—whether vocationalized or not. But some countries have continued to pursue vocationalization policies. Botswana, Ghana and Kenya—the case studies chosen for the present report—are main examples. Even if its cost-effectiveness is in dispute for some decades, many countries will continue to have an active interest in an updated discussion of the topic, since vocationalization purports to address the urgent concern about how to improve the relevance of what is learned in school for the world of work. Thus the purpose of the present study to provide an update on a topic of recurring policy importance.

The study reviews literature on vocationalization and presents three especially commissioned case studies on Botswana, Ghana and Kenya (Part Two of the report). These case studies are substantial studies in their own right and their contribution is in no way exhausted by the use made of them in Part One. The Case Studies made use of available documentation but could not collect extensive primary data beyond information gathered during brief visits to schools and consultations with government officials.

It is recognized that in high-income countries in which secondary education will include the great majority of youth (in particular the OECD countries), models of secondary education that blend general education and vocational training, may be achievable, affordable and appropriate. There are also middle income countries which are pursuing such policies. However, the present question is whether vocationalized secondary education in the medium term is appropriate for developing countries in Sub-Saharan Africa—given the concerns which are important for Vocational Education and Training (VET). In particular, is vocationalization superior to purely general education in preparing for labor market entry and for subsequent vocational and technical training? Eventually, the issue is whether it is superior in improving the productivity of labor, and at what cost? Thus, the study looks at one aspect of secondary education—through lenses which we think are appropriate for VET.

## **2 STARTING POINTS**

### **2.1 Rationales for vocationalization**

These categories of goals are suggested for vocationalization policies: personal development goals, socio-political goals, and economic goals. Vocationalization will have different rationales, depending on the main goals which policies have.<sup>5</sup>

---

<sup>4</sup> Empirical tracer studies include: Psacharopoulos and Loxley (1985) on Colombia and Tanzania, Lauglo and Närman 1987, and Lauglo 1989 on Kenya, Chin-Aleong (1988) on Trinidad and Tobago. Lauglo and Lillis (1988) includes summary reports from some of these studies and a collection of other contributions from the mid-1980s. Coombe (1988), and more recently Hoppers (1996), have provided general reviews of the international research and evaluation literature on vocationalization.

<sup>5</sup> The categories are close to those used in Coombe's (1988:3) review for the Commonwealth Secretariat (which refers to earlier UNESCO usage).

### 2.1.1 Personal development goals

Dominant theories of general education point to the ideal of educating ‘the whole person’. A well rounded education would develop a wide range of talents including moral, aesthetic, and physical capacities--not only a grasp of academically disciplined knowledge. Practical subjects are valued because they add variety to the school week by allowing students to learn from more active ‘doing’ than what is typical in academic subjects. Under this perspective, the teaching of practical skills and familiarization with the ‘world of work’ do not need to be justified only as skills preparation for specific occupations. They are legitimate parts of general education.

One example is the teaching of handicrafts skills (sløyd) within lower secondary education in the Nordic countries, or contemporary Design and Technology courses in a number of other countries--including Botswana (Weeks, BCS). To be sure, preparation for the world of work is in a general way part of what such subjects usually for, but under this perspective these subjects can be valued as *general skills* in practical design and problem solution—not only in work situations but also for their private use and. Further, teaching *about* the ‘world of work’ is legitimately valued as a means of enabling young people to make better informed choices about their future as well as teaching knowledge about an important part of human life.

### 2.1.2 Socio-political goals

A ‘diversified curriculum’ structure in secondary schools has sometimes been seen as an organizational means to achieve greater equality of opportunity because it would cater to a wider range of talents and purports to prepare for a wider range of future activity, than purely academic curricula. This view has been associated with the development of comprehensive secondary schools in many countries. The influence of the United States helped propagate this idea of comprehensive secondary education internationally. Socialist and social democratic policies on education have seen the inclusion of practical and vocational subjects as a means to break down social class barriers and teach respect for manual labor.

Some African countries have also historically been influenced by respectively North American or Soviet models of comprehensive secondary school. However, in Africa practical subjects have a more complex history. Under colonial regimes, Africans struggled against racial discrimination in order to gain access to academic education and to the opportunity which such education led to. Practical and vocational subjects were then part of resented racially segregated provisions ‘adapted’ for African subjects (see e.g., Anderson 1970, on Kenya). After Independence, depending on the political orientation of governments, in some countries practical subjects became part of wider measures (e.g., national youth service) intended to assure the identification of the future educated elite with ordinary working people and build national solidarity. With passage of time since Independence, arguments of this type now have become less important for policy making.

### 2.1.3 Economic goals

By teaching vocational skills the hope has been that students would more easily find work when they leave school, and become more productive and trainable. Sometimes, a declared goal is even preparation for self-employment. By easing the transition to work for school leavers, the hope has also been that the prevalence of antisocial behavior among youth would be reduced. Carol Coombe (1988) confirmed that economic goals were by far the most important driving motives behind vocationalization policies in Commonwealth countries. The goals noted by her included: provision of skilled and semi-skilled manpower, reduction of wasted resources caused by weak articulation between education and the labor market, technological literacy, and generally facilitating economic growth and national development.

As noted in BCS, there was in the past also some influence of rural-centered populist ideas of development which would see a high rate of migration to town as a problem to be countered by educational means.

In African countries, the issue at the heart of policy debate on vocationalization has been undoubtedly been 'economic relevance'. The recurring question has been whether vocationalized secondary education in effect turns out to be more 'economically relevant' than purely 'general' education, and if any gains worth the extra cost incurred in producing them. From a VET point of view, these goals are indeed the overridingly important ones. But other issues and objectives have also been evident in African countries when curricula and syllabuses have been framed by educationists—below the 'political' level.

## 2.2 Previously noted constraints

Earlier reviews (Lilies 1985; Bacchus 1988; Lauglo and Lillis 1988, Coombe 1988, Rebut 1988, Hoppers 1996) point to serious constraints on implementation of vocationalization in developing countries, and question the effectiveness of individual programs. Below are some of the main issues and problems. To the extent that available information make it possible, these are also addressed in the case studies for the present review.

### 2.2.1 General constraints

- Vocational or practical *subjects* tend to have *complex tooling-up, staffing and servicing/logistics requirements*—the training and recruiting of teachers, the setting up and maintenance of facilities, equipment, and tools; the supply of materials and consumables; the implementation of assessment appropriate to practical subjects. Because these requirements in all too many cases have not been met in a minimally adequate way, vocational subjects have frequently suffered from run-down facilities and inadequate pedagogy.
- Compared to academic subjects taught purely by 'chalk-and-talk' methods, vocationalized curriculum elements tend to *have much higher unit costs* (due to facilities, equipment, materials, consumables, less optimal utilization of specialist teachers and smaller classes).
- Government commitment is sometimes unclear and planning haphazard.

- By taking time and other scarce resources away from core general subjects, vocational subjects contribute to curriculum overcrowding which in turn leads to learning outcomes of insufficient quality.<sup>6</sup>
- Sometimes vocational or practical subjects lack attractiveness to pupils, parents and teachers. Teacher and student morale can be low.
- Making parents and local communities responsible for equipment and consumables (as in Kenya and Ghana) creates uneven implementation and widespread under-provision of basic necessities for teaching.
- Curriculum design often has flaws (excessive overlap among different subjects, insufficiently logical and systematic progression on taught contents—see Mwiria, KCS).

### 2.2.2 Constraints on ‘economic relevance’

- In severely depressed labor markets, access to jobs will rely strongly on personal contacts, and being at the right place at the right time. This will weaken the link with between training and access to jobs (also true for more highly specialized vocational training than the mild ‘vocalized’ variety).
- Vocational subjects will not receive enough time and attention to give credible ‘entry level skills’---given that they are only minor portions of the total timetable.
- Schools which mainly are run to provide general education, lack incentives and resources to develop labor market links that would help their students. Schools also lack capacity and incentives to adapt their teaching to skill needs in the labor market.
- It is unrealistic to expect that vocationalized education will directly prepare for self-employment. Self-employment tends to follow a period employment.
- Good marks from general education are more in demand by employers who think such marks are taken as a proxy for being ‘bright’, ‘hardworking’ and able to learn on the job.
- Access to further training in the economic sector for which vocationalized subjects purportedly prepare, can place a premium on academic subjects rather than vocational ones (especially the type of further training that is clearly part of higher education) (See BCS, GCS but KCS will not fit).

Little attention has been given to constraints and problems in realizing personal development goals, or socio-political goals. The following may be suggested:

### 2.2.3 Constraints on ‘personal development goals’

- The prevailing pedagogy in vocational subject, backed by methods of assessment, fails to develop problem-solving skills and places excessive emphasis on

---

<sup>6</sup> This is of course true for all subjects—they take time away from each other, and all subjects have their rationale. But few would question the need to retain certain ‘academic subjects’ at the core of a secondary education (certainly at least language, mathematics) ahead of practical ones--if the curriculum must be made less crowded.

memorization and on working to instructions. (Will fit KCS, GCS. However, Botswana *does* stress process goals).

- ‘Familiarization’ and ‘orientation’ goals can be diffuse and give insufficient guidance to what should count as learning.
- Taken on its own, ‘usefulness for private life’ can seem like a luxury that should be given low priority for publicly financed provision, when such private benefits would reach only a small minority of youth, when the expense of providing these subjects is high, resources are very scarce, and when poverty is widespread.

#### 2.2.4 Constraints on ‘socio-political goals’

- When only a small minority of youth have access to secondary education, a model of school that would cater for a wide range of talents and needs (including vocational subjects) in the same locality, will be impracticable.<sup>7</sup>
- In practice, vocationalized options that run parallel to academic ones—or which are offered within streams that include ‘less difficult’ variants of core academic subjects—can reinforce rather than ameliorate social inequality, if children of the elite go for the ‘more’ academic options, and vocational subjects predominantly recruit those from disadvantaged backgrounds. (The KCS and the BCS suggest this may be happening at present).
- Positive attitudes towards work, including ‘practical work’ is not necessarily lacking among secondary school students. If ‘favorable attitudes’ in fact are lacking, schools are not very good at changing them.

The list of goals and of these constraints show that there is a sharp gap between the high hopes held for vocationalized secondary education and what has been achieved by it.

### 3. FINDINGS

#### 3.1 Policies are mainly driven by search for ‘economic relevance’

In Kenya, in the 8-4-4 reform of 1986, large scale implementation of vocationalization was clearly intended to enhance the transition of secondary school leavers into employment and further training. It was to provide a practically oriented curriculum that would offer skills for a wide range of employment opportunities. The new system was to ensure that students graduating at every level have some scientific and practical knowledge that could be utilized either for self-employment, employment or for further skills training. There was also some concern with preparing students to that they

---

<sup>7</sup>The comprehensive school model also has its problems as a venue for vocational skills training in high-enrolment, economically advanced countries. There will be a case for some division of labor among schools so that only some are really ‘vocational’ in a major way; and more specialized institutions with strong connections with their respective labor market segments are generally needed. See the discussion on school-based training in Lauglo (1993) .

would better adjust to their domestic worlds. All secondary schools were required to offer vocational subjects (Mwiria, KCS).<sup>8</sup>

In Ghana, a key feature of the 1987 Education Reform Program, was the provision of vocational education at both the 3-year junior and the 3-year senior secondary school level *in order to equip students with the skills for paid and self-employment*. The intent was that all junior secondary school students were to study a 'pre-technical' subject. Schools would also offer a range of arts and crafts options which were called 'pre-vocational' (Akyeampong, GCS).

In Botswana, policy has been framed in a more consultative and step-wise manner than in the other two countries—as part of 6-year rolling plans, guided by National Commissions on Education. There has been attention to '*pre-vocational*' aspects (preparation for subsequent vocational training) but also awareness of risks and caution against unrealistic goals. There has been caution in policy documents of "misdirected vocationalization efforts" elsewhere. However, the emphasis on vocationalization has increased over time; and in the eyes of the Ministry of Education, pre-vocational education should "*arm students with the skills they will need when they enter the working world.*" (Weeks, BCS: 19) Agriculture has recently been made part of the compulsory core of the 3-year junior secondary curriculum, and each student must take a second practical subject. In 2-year senior secondary school, more practical and work-related subjects are being introduced as options.

In the actual curricula and syllabuses of vocational subjects, objectives which stress general education and personal development, and socio-political goals such as stimulating interest in and practical work and concerns with gender equity, are also mentioned (Akyeampong, GCS:4).

It is especially politicians who show optimism about the capacity of vocationalization to serve economic relevance goals. Thus on 5. October 2002, President Festus Magee of Botswana had the following to say at the 30th anniversary of Manu Senior Secondary School (he was explaining that Botswana would be investing over US\$ 100 million during National Development Plan 9, 2003-2009, to build four new senior secondary schools and invest approximately US\$ 4 Million more in each of the 27 existing Senior Secondary Schools):

*The primary focus of Botswana has been to prepare Botswana for a transition from the traditional agro-based economy to an industrial one ... a diversified and expanded curriculum that includes subjects such as Business Studies, Art [and Design.], Design and Technology and Computer Studies would enhance the development of entrepreneurial and employment skills among school leavers.*  
(Reported in the government newspaper *Daily News* 7 October 2002, page 1)

Yet no attempt has so far been made in Botswana to ascertain whether practical subjects do provide an advantage in the transition to employment (or self-employment) or function as preparatory for subsequent related vocational training.

---

<sup>8</sup> Previously such subjects only existed in a number of junior secondary schools. The 8-4-4 system which was introduced telescoped the previous system of junior and senior secondary schools into one 4 year course.

Different stakeholders may differ in the goals they perceive for vocationalized education. Educators close to the subjects' history will more readily see this form of education as a legitimate part of general education, rather than judging it as a 'thin form' of VET. Students and their families will have their own goals in mind, especially what the chances are of doing well in exams and boosting one's grade point average. However, in all three countries the main political drive has been to improve the economic relevance of secondary education and ease school-leaver unemployment.

## 3.2 Implementation issues

### 3.2.1 Program preparation and resourcing

Botswana, Ghana and Kenya are all countries which decided to 'go it alone', with strong commitment at the very top political level, after the World Bank came actively to discourage countries from adopting vocationalization policies and donor interest in vocationalized secondary education dried up in the 1980s. Financial and technical support from external agencies has not played an important part in the vocationalization described in the case studies in Part Two of this report. In other respects, the process of formulating policy and the resourcing provisions differ sharply among the three countries. Kenya in particular, but also Ghana, are countries where the decision to vocationalize was taken quite suddenly by the highest political level with very little preparation. In both countries the finance for implementation has been sharply inadequate. In Kenya under the new policy from 1986, parents had to meet the costs of setting up workshops and procuring equipment through parental and community levies and other levies (equipment fees).<sup>9</sup> In Ghana, at Junior Secondary Level, no extra allocations were made to finance vocational subjects—the assumption was that somehow local resources would be found for equipment and supplies when these subjects were introduced. By way of contrast, in Botswana, the decision to vocationalize seems to have resulted from a thorough preparatory process with costing of resource requirements; and implementation is being backed by substantial resources from a government which is financially much better endowed than in the other two countries.

*Taken as a group, the three cases show the necessity of systematic planning and readiness to provide needed resources before embarking upon vocationalization on a large scale.* Botswana appears to have done a great deal of preparatory groundwork. But the Kenya and Ghana case studies note that problems of inadequately staffing and under-resourcing have been very pervasive. In Kenya, the seriousness of the resourcing problems have led to reconsideration of policy in favor of moves in 2002 towards a leaner secondary school curriculum—in keeping with advice from external financing agencies.<sup>10</sup>

---

<sup>9</sup> An exception was made for parents in certain arid areas which were politically favored for expenditure on facilities and equipment.

<sup>10</sup> The donor-funded 1998 Master Plan on Education and Training recommended such change, but was never adopted officially. However, in 2002 the range of vocational subjects offered was restricted. Industrial Education subjects and computer studies were dropped, on cost grounds.

### 3.2.2 Curriculum structures

In all three countries, it is at the *junior* secondary level that the drive to vocationalize has been strongest. It is in this stage that vocational subjects, when offered, have tended to be compulsory for students. In Kenya, it was in the junior stage that the present vocational subjects were pioneered in the 1970s and 1980s—prior to the merging of the two stages into a single secondary cycle under the current 8-4-4 system of education. In Botswana and Ghana, which have two-stage secondary systems, it is in the junior stage that all students must take at least one vocational subject. In the upper secondary stage, vocational subjects are optional but implemented on a large scale. In 1996, about half of the senior secondary students in Ghana offered a vocational/technical subject for the West African Certificate of Education examination. Since many junior secondary students will leave school before senior secondary, the question of relevance of their education for the world of work is politically important.

In all three countries, the response to the problem of economic relevance has come in the form of vocational *subjects*. It should be noted, that in contrast to what is the case in specialized vocational training institutions, these vocational subjects constitute only a minor portion of the curriculum in the secondary schools, as shown in Table 1. Viewed as vocational training, they would give very thin coverage of VET.

Table 1. Approximate proportion of weekly timetable devoted to vocational subjects in the secondary schools

	Botswana	Ghana	Kenya
Lower secondary stage	15%	13%	n/a
Upper secondary stage (if vocational option is chosen)	11 – 22%*	23-31%*	n/a
Single cycle secondary education	n/a	n/a	7-11%*

\*Percentage depends on type of vocational course chosen and/or individual schools have some discretion as to timetable balance between general and vocational subjects.

There is considerable overlap among the countries in the subjects offered. Agriculture, home economics, and commerce (business/typing/accounting) subjects are among the most commonly offered vocational subjects. One reason is that they are relatively inexpensive (See Chapter 3.4) and appear to be more easily established and staffed than other vocational subjects. Variants exist within these broader courses.

Subjects like metalwork, woodwork, motor mechanics, and electricity (a cluster historically associated with Industrial Arts subjects in North American high schools) have not had expanding coverage in the 1990s. Botswana has recently combined and adapted such subjects into Design and Technology, which probably has more affordable unit cost (see table 5, below). Rather than adopting Industrial Arts subjects, Ghana has given special emphasis at junior secondary level to visual arts such as ceramics, sculpture, picture making. Kenya has had Industrial Education subjects (originally Industrial Arts) in some secondary schools since the 1970s, but decided in 2002 to abolish them and transfer equipment to specialized vocational training colleges.

Provisions for computer education show contrasts between the countries. Botswana is in the midst of implementation of basic computer awareness in all secondary schools, with examinable computer studies offered as an option in the senior secondary stage. In Ghana and Kenya, provisions are very limited and confined to better off schools, but have had a high rate of growth in recent years (see Chapter 3.2.5, for more detail).

In all three countries, there is at the level of policy recommendations, interest in the economic relevance of generic skills.<sup>11</sup> A 1999-commission in Kenya pointed to the importance of learning to “communicate better, work in teams with less supervision, use information technology to access new ways of doing things, promote entrepreneurship ...be creative. [show] initiative for problem solving” (Mwiria, KCS:3 ). Only in Botswana is there evidence of any real effort being made to shift pedagogy towards activity methods and problem solving. A facilitating measure is introduction of a much greater role for continuous assessment (see chapter 3.2.6). In both Kenya and Ghana, the case studies describe teaching and learning styles in vocational subjects as one-way communication from teacher to student, with heavy reliance on memorization of vocational contents taught as theory—although there will be some individual teachers who seek more innovative ways of teaching practical subjects (See Mwiria, KCS 12-13).

### 3.2.3 Workshops, equipment, materials

Unless minimally adequate workshops, equipment, consumables and trained instructors are provided, vocational subjects will degenerate into being taught ‘theoretically’ with inadequate attention to practical skills learning. This has been a common problem in many African countries. In our three country cases, Ghana and Kenya fits this pattern but Botswana is a dramatic exception.

Already by the early 1990s, the Botswana system was probably better equipped than schools in Ghana and Kenya (though BCS reports that many schools had inadequate workshops and equipment). At present, Botswana is in the midst of a large-scale investment program in workshops and equipment for vocational/practical subjects—and school construction more generally. Practical subjects have been given a prominent emphasis in the architecture and layout of both the junior and the senior secondary schools in Botswana. In the past decade, nearly all schools have been completely rebuilt (an investment unparalleled in Africa). Junior secondary schools have computer laboratories, a Design and Technology and Home Economics block; a Machine room for Design and Technology, a new Art room and space for ceramics and sculpture; and so on. Recently, “pavilions”, with two substantial rooms and storage areas under one roof, have been built at the larger junior secondary schools to provide additional space for Design and Technology. In the senior schools the new facilities for Art and Design, Home Economics, Computer Studies, and Design and Technology are among the best in the school. The BCS (p. 21) describes in further detail this impressive investment in process.

The Kenyan story is the opposite. From 1986 responsibility for facilities, equipment, consumables and materials in practical subjects were shifted over to parents. Previous donor support for technical and industrial variants of vocational subjects came to an end. Overall, resources have for equipment and materials have as a result become extremely

---

<sup>11</sup> May be defined as widely useful process skills (e.g., teamwork, communication skills, skills in choice of problem solving strategies).

meager; but there is variation. Schools run by NGOs/religious organizations will sometimes have conduits to their own sources of funding and tend to be better equipped than others. Some subjects do not require much capitalization (e.g., accountancy, business studies, agriculture—if the school already has some suitable land). But on the whole, the KCS notes that many schools are reduced to teaching “mainly obsolete theoretical knowledge that is the main focus of the national examination system” without much capacity to teach the practical side. The Kenya case study refers to lack of books and teaching materials, notes that some materials are expensive because they need to be imported, and that the teaching material are of poor quality. The other case studies do not comment on this issue.

The severe deficiency of workshops and equipment for the teaching of vocational subjects in Kenya is indicated in a recent survey carried out for JICA by Nishimura and Orodho (1999) of 7 secondary schools in 5 provinces. They found much variation among schools, but only 13 of 104 teachers surveyed thought the condition of their workshops or laboratories were adequate for teaching.

In Ghana the vocationalization of junior secondary education was supposed to be achieved without sophisticated facilities and equipment, but this difficult problem was largely left to local schools and communities to solve; and a recurring criticism has been that most schools lack even the most basic facilities for practical work. Less than a quarter of the junior secondary schools are reported to have the workshops facilities and capacity to deliver the vocational options in the curriculum. No special funding from the government is earmarked for vocational subjects (Akyeampong GCS: 6). Similarly, in the senior secondary schools there is widespread a lack of basic equipment for effective technical/vocational education.

To conclude: it appears that only in Botswana will most schools have minimally adequate facilities and equipment for teaching vocational subjects.

### 3.2.4 The supply of teachers

All three countries have severe problems in staffing vocational subjects. In Kenya, most of the secondary teachers have either diploma or certificate level qualifications. Apart from Home Science, there is a general shortage of teachers trained to teach vocational subjects (Mwiria, KCS: 13). This is especially true for agriculture and commerce. Lack of staff with needed skills has been one of the constraints on expansion of computer applications.<sup>12</sup>

Following the introduction in 1987 in Ghana of pre-vocational subjects at the junior-secondary level, the Ministry of Education had hoped that neighboring schools could share specialist teachers in these subjects and that extensive use could be made of local artisans. It was found that that timetables were not flexible enough to accommodate teachers moving from school to school. The use of artisans as teachers reduced the attractiveness of the JSS concept of vocational education in the eyes of many parents. The artisans also lacked the necessary pedagogical skills to teach to large student groups

---

<sup>12</sup> Recent data from the Teachers Service Commission show that shortage of trained teachers is not unique to vocational subjects. The problem is only modestly more serious for agriculture, commerce and computer studies than it is for English, mathematics and certain natural sciences.

and to teach the skills according to curriculum objectives and standards (Akyeampong, GCS:11). Teacher training for vocational subjects has accordingly been expanded.

At present, there are 10 teachers colleges preparing for the teaching of vocational subjects, but teacher shortages are said to be common in rural areas. A 'trained' teacher would also have problems teaching the wide range of craft/vocational subjects which are supposed to be offered in the junior secondary schools. For senior secondary schools, no institution is designated to train teachers in vocational subjects; and schools largely rely on untrained teachers.

In Botswana, apart from agriculture and home science, there is a severe lack of *local* teachers trained to teach vocational subjects. However, the government has had the needed financial resources to recruit teachers extensively from abroad in order to meet this shortage. This is of course an expensive solution. In computer applications Botswana is relying on in-service supplementary training of math's and science teachers, but the present installation of equipment in all secondary schools and the starting up of teaching has been slowed down because of staffing shortages.

In-service support becomes especially important when teachers are not well trained. Yet, the Kenyan case study notes that professional support for vocational teachers is extremely limited. By way of contrast, the Botswana case study notes considerable in-service support and retraining by means of workshops (Weeks, BCS: 32).

*The case studies confirms earlier impressions that lack of trained teachers with specialist skills to teach the subjects, and lack of in-service professional support for teachers, are important constraints on large scale implementation of vocational subjects in secondary schools.*<sup>13</sup>

### 3.2.5 Uneven starts in teaching ICT skills

Information and Computing Technology (ICT) allows the teaching of commerce/office skills (keyboard skill, word processing, spread sheets) which at present are found in the most advanced parts of the commerce and industry. Thus, ICT skills may be seen as part of vocationalization and as geared to a small but growing niche in the modern sector. But ICT is also a tool of growing importance for learning and communicating more generally. The World Links Project, which connects secondary schools in many countries with each other, is an example.<sup>14</sup> For teaching science, ICT can be used in lieu of the older mode of specialist laboratories. In schools that are generally short of teaching and learning materials, there is potentially a role for ICT as a tool for accessing supplementary sources. Basic skills in computer applications will also increasingly be required of students in higher education--as tools their academic work.

As in other World regions, the question in African secondary education is not *whether* computing skills need to be taught, but *how soon* it will be affordable and practicable to introduce such skills, and in what precise ways ICT can be most helpful in a school setting. The present case studies give scant guidance because ICT technology in the schools is very rare in Kenya and Ghana; and in Botswana its major large-scale introduction is too recent for any lessons yet to have been drawn from its introduction.

---

<sup>13</sup> Spreading such subjects 'thinly' across a large number of schools is probably not the most efficient arrangement for making use of the scarce supply of specialist teachers.

<sup>14</sup> Website: <http://www.world-links.org/english/>

In Kenya ICT is an example of promotion followed by a recent retreat. Computer studies was launched in 1996 as an examinable subject in secondary education. The topics taught in this course are: computers and their components, use of computers, basic computer concepts, word processing, programming, fundamentals of spreadsheets, application areas, databases, networks, data communications and the impact of computer technology on society. Guidelines state these physical requisites for the course: physical facilities which include a computer laboratory/classroom, at least one computer for every two students and one printer to every four computers, printing stationery, blank diskettes and storage for diskettes, and software appropriate for the curriculum. All computers should be IBM compatibles.

These requirements are unattainable by a majority of Kenyan schools as a result of which only privileged private schools, established provincial and national schools might be in a position to offer this course to their students. The few less endowed schools that offer this subject largely depend on donations of usually obsolete models of computers, which are housed in poorly built computer laboratories or in a small section of a normal classroom. The lack of qualified teachers, of maintenance technicians and of electricity, and the relatively high cost of the needed equipment, account for the fact that only 2% of the schools that register candidates for the Kenya Certificate of Secondary Education (KCSE), offered this course in 2001. Computer studies is not the most expensive subject in terms of needed facilities and equipment. A subject like Home Economics requires a greater investment if set up according to guidelines (See Table 2).<sup>15</sup> But computer studies has high cost on consumables (e.g., electricity, maintenance)--a type of expense which hard-strapped schools are hard put to meet.

As part of the recent steps to consolidate the range of vocational subjects offered in secondary schools, Kenya has decided that starting in 2003 it will stop offering computer studies, along with the industrial education courses and one of the business courses--typewriting with office practice.<sup>16</sup> However, the withdrawal of computer studies has been contentious because ICT is seen as crucial for future participation in the global economy. The enrolments, though low, have grown fast (25 in 1998 to 1,113 in 2001). There are also well-endowed private schools which have been successful in their course development (the KCS points to Strathmore College in Nairobi as an example).

Some individual well-endowed senior secondary schools in Ghana are beginning to set up computer laboratories to promote computer literacy among students—particularly in business programs. The eventual introduction of ICT has been recommended; but so far, no official syllabus has been issued; and introduction would require expenditures that the current arrangement for funding senior secondary programs would not be able to support.

---

<sup>15</sup> Nor computer studies the most expensive course to mount in Botswana in terms of unit cost (See Table 5)—even when the estimate only took account of examinable course work and does not include not the use of resources for more superficial ‘computer awareness’ teaching (See also Table 8 in the BCS).

<sup>16</sup> This course is expensive to mount a school has to have a typewriting workshop, at least one typewriter to two students, computers for those schools that can afford them and appropriate stationery. Where schools use electric typewriters, a reliable supply of electricity is a must. As a result, this subject is offered by only 3% of all the schools that registered students for the KCSE examination in 2001.

In contrast to the two other countries, Botswana has launched large scale introduction of ICT teaching in its secondary schools both at the junior secondary and the senior stage. Botswana distinguishes between computer awareness (non-examinable) and computer studies (examinable). Whether these subjects are treated as part of mathematics and science in terms of curriculum grouping, or as practical subjects, varies from school to school—reflecting the wider application which ICT of course has, than its vocational use.

The will to implement is demonstrated by the Ministry of Education's commitment to equip all computer laboratories by the end of 2002; and that—in addition, some other practical subject departments will get their own computers (like Art and Design, Design and Technology and Home Economics) (Chapter 3.2.3 above, and Weeks, BCS: 26). Schools are having difficulty replacing antiquated hardware and some are unable to spend their funds on time because they fail to cope with the tendering process. As of September 2002, access by staff to computers at most secondary schools was still very constrained. The schools had been provided with facilities for computer laboratories, but the process of procuring and installing equipment was in still in process.

The curriculum is still in the making. A syllabus for Forms One to Three and text books have been distributed to junior schools. Computer Awareness for Form Four appears to be at the whim (what they know and what they think should be taught) of the teachers who take responsibility for it, though guidelines exist.

One early lesson Botswana is drawing is that lack of qualified teachers is a major obstacle even when equipment and facilities can be afforded (See Chapter 3.2.4). Especially in junior secondary schools staffing of ICT teaching will be a major challenge given the large number of students who are to get some exposure and learn very basic skills as part of “computer awareness” (which is to be taught to all students).

All in all, the case studies show extreme contrast in policies and implementation teaching computer skills. The pioneering work now done in Botswana will be something for other African countries to watch, in order to draw lessons from what still is very much in the making.

### 3.2.6 Assessment of learning

In Ghana and Kenya the final assessment of student performance in vocational subjects relies nearly exclusively on external examinations. Written exam papers are important. Botswana has made a shift towards reliance on internal assessment.

In Kenya, where vocational subjects are electives, students do a practical project in the vocational subjects; but this only counts 10% of their final mark. Ninety per cent of the mark depends on performance in the national examination. The absence of physical infrastructure and equipment in many schools, drives the focus of the examination strongly towards theoretical contents in what should be a practical subject, and much of the theory tested is memorization of factual material rather than ability to interpret and apply. According to the KCS, these features of the examination tend to reduce what should mainly be learning of practical skills, to memorization of facts.

In Ghana, in most subjects, there is a mix of theory papers and one or more other forms-- ‘practical papers’, practical examination, or in some cases practical projects carried out over a longer period, or practical examination. Very few ‘problem solving’ questions are found in the exams. There is emphasis on knowledge and understanding of

subject matter—with insufficient attention to practical skills; and there is little official recognition of newer assessment approaches such as criterion referenced assessment<sup>17</sup> or portfolio based assessment.<sup>18</sup>

Ghanaian teachers rely directly on West African Examinations Council syllabuses or previous examination questions for clues on what to emphasize in teaching of vocational subjects. Syllabuses are not widely available; and not all topics examined in the West African Examinations Council (WAEC) syllabuses for Senior Secondary School are found in the syllabuses in vocational subjects.

Botswana has gone much further than the other countries towards giving weight to practicals. This trend is at present being strengthened. Up to 50% of each students' final grade will be made up of marks on practical tasks and of the student's own individual project. Continuous assessment will count towards final assessment (Weeks, BCS: 22-26), and 'research projects'/practicals projects carried out by students and portfolios of their work are to count strongly in that assessment, with procedures depending on the subject concerned. For example, in food and nutrition as part of home economics, the individual project (or portfolio) counts 30% towards the overall grade, 2 practical tests add up to 20%, and a final exam counts 50%. The individual project (or portfolio) is in turn assessed as follows: presentation 5%, task analysis 10%, planning 10%, investigation and research 30%, realization/model/design 20%, communication 10%, self-evaluation by the student 15%. Problems in the implementation include lack of teacher skills and lack of available reference materials to support the new methods of teaching and assessment.

*The case studies show great variation among the three countries as to how assessment techniques give due recognition to practical skills. Botswana has progressed further than the other countries in this regard and Kenya the least., In Kenya and Ghana there is still in vocational subjects heavy reliance on pen-and-paper exams that mainly test memorization of facts.*

### **3.3 Implementation-related issues**

#### **3.3.1 Are vocational/practical subjects doomed to lack attraction to their clientele?**

It has been claimed that vocational subjects lack attraction to students and their parents because white collar work carry more status and vocational subjects are not perceived to lead to good economic prospects (Foster 1965, Urevbu 1988). Often, vocational subjects (just like vocational training in specialized institutions) is perceived by people outside these fields, as mainly suitable for the academically less able, compared to purely academic secondary education. Is 'lack of attraction to the clientele' a problem for vocationalized secondary education, under the conditions of scarce education and training opportunity which characterize the condition of youth in Sub-Saharan African countries?

---

<sup>17</sup> The criteria would specify tasks and operations that need to be adequately performed.

<sup>18</sup> The portfolio would contain specimens of the student's work over time.

Kaluba (1986) noted the select character of technical secondary schools in Zambia (about 1/3 of their curriculum was vocational) and showed that practical industrial arts subjects were popular with students also in purely academic secondary schools. Wright (1988) reported similar findings from Sierra Leone. More specialized vocational training than the mild variants of vocationalization *can* be highly select in their intake. In Eritrea today (Annex 2 in World Bank 2002) the technical secondary schools--which are about ½ vocational in terms of curriculum time (but which also qualify for university entry), have much lower drop-out and repetition rates than purely academic schools, in part because they have an *academically more select* intake of students.<sup>19</sup>

### Kenya

In the mid 19890s, the technical secondary schools in Kenya (about 1/3 vocational) were on a par with general secondary schools of high status, in attracting academically select students from primary schools (Lauglo 1989). Similarly, in most of the academic secondary schools offering industrial education subjects, students who chose these subjects as an examination option were *academically* equal to, or even clearly outperforming, purely 'academic' students (Lauglo 1985, Lauglo & Närman 1987). The same research found strongly positive views of vocationalization among parents—according to a special survey carried out in 13 of the schools covered in the study (Lauglo 1985:42-48).

Attitudes to these subjects may have changed in Kenya since that time, with the cessation of donor support and the thin spreading of some exposure to a vocational subject to students across the entire system of secondary education as part of the 8-4-4 structural reform initiated in 1986. As noted in Chapter 3.2, the vocational subjects are severely under equipped today and taught by teachers who lack adequate training for these subjects. Comparable data to earlier findings are lacking, but impressions reported by the KCS from school visits, show less encouraging results than in the mid 1980s. If the subjects are run-down for lack of material and human resources—this is often the case; it is understandable that attitudes by students and parents towards the subject will tend to become negative.

The KCS reports the impression that “it is increasingly clear to the more informed Kenyan parents that the post-graduation success of their children has little to do with the acquisition of vocational skills in a context of a depressed economy where employment opportunities are shrinking every year” (Mwiria, KCS: 36). In Kenya, a special reason for loss of attractiveness to parents is the policy which made parents financially responsible from 1986 for the cost of workshops and equipment (See also Chapter 3.2.1).

In terms of attractiveness to students, the impression reported in the KCS is not uniformly bleak. In sharp contrast to the findings from the 1980s, the KCS does state that students who do very well in academic subjects now rarely enroll in vocational options, and that the most highly regarded secondary schools in Kenya today offer very few

---

<sup>19</sup> This does not mean they are successful in all other respects. Students are dissatisfied with the quality of the technical courses and since these courses do not count in the examinations, they concentrate their efforts in the final year very much on their academic courses. Though students entering the labor market have few problems finding work, most students go to higher education and then without privileged access to technology courses. Thus, in most cases they are unlikely to make use of their 'technical courses' from secondary schools, in their career.

vocational subjects. But the KCS also gives instances of schools where vocational subjects like metal work, home science and woodwork are adequately equipped and well taught, and that these subjects can then be quite attractive to students.

A recent survey of students and teachers in 5 (out of 8) provinces by Nishimura and Orodho (1999:48-51) showed that vocational subjects were more popular among students than among teachers in secondary schools, and that 34% of the students (out of a sample of 193) put down either agriculture or another vocational subject as their 'best liked' one. They were also asked to state their opinion about the usefulness of vocational subjects. Forty-eight percent of the secondary school students (but compared to only 6% of their teachers out of a sample of 104) thought these subjects were necessary and important.

However, 'useful' could to many students simply have meant useful in passing exams.<sup>20</sup> In general, among the conditions which make subjects attractive to students is the perceived chance of doing well in the subject—getting a good grade. When the failure rate is high, as in many subjects in secondary schools in Sub-Saharan Africa, students will shun options in which they think they are likely to fail, and gravitate towards options they hope to do well in. Are vocational subjects attractive to students because they are perceived as 'soft options'?

In Kenya, in the mid-1980s, the industrial education subjects were definitely not perceived by teachers and students as a subject in which it was easy to get a good mark (Lauglo 1985). But they may have *become* soft options in the 1990s as part of the 8-4-4 system of education which has sought to introduce vocationalization on a mass scale in the secondary schools. Nishimura and Orodho (1999:49) write from their 1999 survey of Kenyan secondary schools that the teachers in assessing the popularity of vocational and other subjects, qualified their responses by stating that the lack of basic learning/teaching facilities in school has made the teaching of vocational subjects a mere joke—suggesting that “students do not have to struggle to pass” (p. 49). The KCS records the impression that students perceive some vocational subjects as relatively easy to pass and do well in, and thus as a chance to boost their grade point average with a view to competition for entry to higher education—especially when vocational subjects give extra points, as they have in Kenya, for admission to certain studies in higher education (See chapter 3.5.6).

### Botswana

The Botswana study (BCS) confirms the impression just noted, that students shun courses in which they think the chance of passing is low. There was a tendency for enrolment in Design and Technology and in Fashion and Fabrics to decline in schools where O' Level examination results had been poor the year before. Primary data on the relative attractiveness to students of vocational options in the senior secondary schools are lacking, but the BCS notes that the attractiveness will also depend on what other subject options with which a vocational course can be combined. If vocational subjects can only be combined with the less demanding variants of science (as in some schools in

---

<sup>20</sup> It could be argued that students will seek to provide what they think might be a normatively correct answer, thus inflating the extent of true preference for a vocational subject or faith in its usefulness. However, Nishimura and Orodho (1999:74) also found that most students in the youth polytechnics (which also were included in their study) stated that their instructors were not hardworking—an answer indicating readiness to give frank opinion when applicable.

Botswana), they will tend to be perceived by students and parents as suitable mainly for the 'less able'.

Otherwise Botswana shows that regardless of relative 'status' vis a vis academic education, vocational training of a more specialized kind than secondary school courses can be highly selective. In 2002, a post O' Level vocational training course with space for 180 trainees was advertised and received 18,000 applicants.<sup>21</sup>

### Ghana

A frequent worry among vocational staff who were interviewed in the four schools covered in the present Ghana case study, was that vocational subjects are seen by students and non-TVE teaching staff as suitable mainly for academically weak students. A study by Ampiah (2002) of attitudes among junior secondary school students to different school subjects found that vocational subjects rarely ranked among the best liked subjects, especially among boys.

The GCS pointed to some differences among vocational programs in the academic caliber of their students. Agriculture tended to recruit students of lower academic caliber than did 'technical programs'.

Regardless of the relative attractiveness of vocational subjects in the eyes of others, what matters more is the commitment of those who take these subjects and of their teachers. Relatively low status vis a vis academic subjects need not be much of a problem when opportunity for any kind of education and training is scarce. King and Martin (2002:18) report from a survey of seven highly select senior secondary schools in Ghana that those who were enrolled in vocational programs had supportive attitudes towards their choice. Students were asked to indicate the two school subjects "that would help you in the work you want to do". It was found that they nearly always picked the subjects that were at the heart of their specialization—also when their specialized stream was vocational.

. . . . .

There is no iron law of 'low' attractiveness of vocational subjects. Even when such subjects may be seen as suitable for the 'less able' in the eyes of others, such subjects can have committed students and be taught by committed teachers. Nor is there an iron law which says that vocational subjects lack attraction to academically well qualified secondary students. When vocational subjects can be combined with a sufficient load of academic subjects to make students eligible also for further academic education, they can have attraction as 'something to fall back upon'--as a means to hedge one's bets on continuing higher up the educational ladder. Such attraction will be boosted when vocational subjects are well taught and well equipped, and when they are perceived to give advantage for opportunities in the future

### 3.3.2 Gender inequity

All three countries have gender biases in their vocational enrolment. Boys gravitate strongly to those subjects which are associated with traditionally male occupations—building and construction, and workshop subjects. Home economics is nearly

---

<sup>21</sup> Personal communication from Sheldon Weeks.

exclusively taken by girls. No strong attempt appears to be made in any of the three countries to mitigate these biases. Other subjects are probably sufficiently mixed to allow either sex to enter without having to overcome strong social barriers to actually take the subject, though there may be gender stratification in the labor market for which these subjects prepare, e.g., business subjects/office skills. It is noteworthy, that in Kenya, enrolments in computer studies appears to be fairly well gender balanced.<sup>22</sup>

### 3.4 Cost

In his extensive analysis of ‘vocationalized’ curriculum costs in Kenyan secondary education in the 1980s, Cummings (1985, 1988) found unit costs to vary greatly among different types of vocational/practical subjects, and that it also varied greatly among schools, depending on whether boarding was provided and on the degree to which staff time was optimally utilized. For any vocational subject that mainly is taught to half classes’ (e.g., 15-20 students), he noted that the total unit costs—e.g., recurrent costs and depreciated capital costs per student hour will usually be more than twice that of purely chalk-and-talk academic subjects. Sometimes the unit cost will be very dramatically higher. Those generalizations still stand.

#### 3.4.1 Kenya

Table 2 below, sets out 2002 cost estimates in Kenya from 5 school sites visited by Mwiria during the Kenya Case Study, and costs one facility from each site. Costs of teaching, of books, and of examining would come in addition to the figures in this table.

Each row represents data from one school, and will reflect overall cost-variation among schools. The estimates show high cost per student place of these vocational subjects compared to a standard classroom or a science laboratory. Older estimates of unit capital costs for a greater range of vocational subjects are available for Kenya. Table 3 presents cost-relativities for the early 1980s, when donors helped finance facilities and equipment for technical subjects in Kenyan secondary schools. It is based on Ministry guidelines for construction and equipment costing at that time. When the estimates made of depreciated capital costs per student-place (in terms of facility and equipment) in a regular classroom is set to 1, the figures in Table 3 illustrate the cost relativity among some of the then existing subjects.<sup>23</sup>

---

<sup>22</sup> Kilemi Mwiria suggests that girls are given an added impetus to take computer studies because this subject is a prerequisite for access to modern sector secretarial occupations.

<sup>23</sup> The cost of land was not included for agriculture. Expenses on consumables were not included. These relativities are exaggerated, since the cost of desks were not part of the baseline costs of a regular classroom.

*Table 2. Estimated costs of a science laboratory and vocational workshops in 5 Kenyan schools (In US\$ equivalent)<sup>24</sup>*

Subject	Cost of Building Workshops (1)	Cost of Equipment (Assumed usable for 5-10 years) (2)	Consumables (yearly) (3)	Student places (based on exam entries) (4)	Estimated cost per student place (5-year period) (5)	Cost relativity per student place (class room = 1) (6)
Computer studies (private high cost school, Nairobi)	20,000	25,000	2,000	17	553	15.8
Home science (public, low cost school, Bungoma)	40,000	25,000	500	22	600	17.1
Woodwork (public school, Nairobi)	25,000	10,000	1,000	19	379	10.8
Science lab. (chemistry)(public school, Meru)	30,000	10,000	1,000	90	91	2.6
Standard class room (Kiambu)	5,000	1,500	200	40	35	

Source: Mwiria: KCS

Given the variation among schools, and the differences in procedures used to make the estimates, tables 2 and 3 should primarily be seen as illustrative of the great range in unit cost among different subjects, both in the early 1980s and at present.

*Table 3. Estimated ratios of capital costs per student place by subject. Kenya 1985 (1= normal classroom)*

Agriculture (simplest structure)	1.1
Agriculture (more permanent structure with fitments)	2.0
Accounts/commerce	2.5
Science	3.8
Domestic Science	5.6
Typing/office practice	5.7
Power Mechanics	9.5
Woodwork	10.0
Electricity	14.0
Metalwork	14:5

Source: Lauglo 1985: Table XII-4, data supplied by Cumming 1985

Along with computer studies (not yet offered in 1985), the subjects which in 1984 were the five most costly ones to develop, are also those which the Ministry recently has decided to phase out, largely on cost grounds. Regarding computer studies, which also is

<sup>24</sup> Source: MoEST and school level data (5 schools) (2002)

Notes: (1) 1 US\$ = 78 KES as of June 2002; (2) The estimates for the computer facility is for a top of the range private school. The average cost in a public school would be about 1/2 of the cost of this high cost private Nairobi school; (3) Construction and equipment costs are on average 10% higher in the rural than urban areas; (4) A woodwork workshop (if using basic hand tools) is much cheaper to set up and maintain those of other industrial subjects.

being closed; Mwiria notes that in a public school the average costs in computer studies would be about ½ of what was found in the private high cost school for which figures are given in Table 2. On that assumption, the unit cost of computer studies taught in public schools would be probably not exceed the cost level of woodwork and home economics—but this would obviously be a loose estimate.

As noted earlier, the cost of providing facilities and equipment in Kenya falls upon the parents, leading both to much dissatisfaction with costly subjects and many inadequate facilities. Cost constraints strongly shape what vocational subjects schools choose to offer. It is not surprising that agriculture and commerce/accountancy often are chosen by the schools. These were among the cheapest vocational options in 1984.

Less than optimal use of expensive facilities can be a source of inefficiency in vocational subjects. Judging on the basis of utilization norm worked out by the Ministry of Education and looking at the actual use in the schools), the 1985 study by Lauglo (1985), which now admittedly is dated, found that these specialized facilities were considerably under-utilized during the school week, and especially so in small schools.

Unit recurrent costs will depend strongly on class-size. Using exam entries at 11 schools as an indicator of class size, Mwiria (KCS) notes that class sizes of vocational subjects are distinctly small—and smaller than those of science courses. For example, while the mainstream sciences enroll an average of at least 30 students for the KCSE examination, except for commerce and to some extent accounting, all the other vocational subjects fewer than 20 students and in some cases even fewer than five candidates. Thus, the Kenyan experience indicates that not only are vocational subjects expensive to develop ‘per student place’, but the volume of such places available in a school could be made better use of.

### 3.4.2 Ghana

The Ghana Case Study collected cost data from 4 senior secondary schools. Great variation in teaching cost was noted among schools—in keeping with what cost studies in education generally show. The differences will mainly reflect *class size variation* which is partly shaped by enrolments in a school and within overall enrolment constraints, by the timetable and the choices made by students. Table 4, below, illustrates the very great variation among both subjects and schools, in estimated unit teaching cost in Ghana

Table 4 Teaching costs per student period for Technical subjects and Agriculture across three schools.(Ghanaian ¢)

Subjects	School		
	Mfantipim	Mankessim	Oguaa
	Teaching Cost Per Student Period	Teaching Cost Per Student Period	Teaching Cost Per Student Period
Building Technology	4,723	1,898	22,289
Technical Drawing	16,572	1,898	22,289
Wood Work	58,205	-	66,869
Metal Work	48,702	1,898	-
General Agriculture	-	8,816	8,426
Crop Horticulture	-	9,780	8,426
Chemistry	604	8,412	

(¢ = US\$ 0.0001 as per 12. 16.02)

Source: Akyeampong GCS, Table 15, p. 39

The Ghana study noted that vocational courses will sometimes be under-subscribed in small Senior Secondary schools (in which these courses are optional, not required of all students), thus driving unit recurrent cost up in such institutions.

For two schools it was possible to estimate total unit costs per year, inclusive of annualized capital costs. It was found that the difference in total unit costs among different curriculum programs was mainly due to recurrent costs (Akyeampong, GCS: Table 19, p. 42). The total unit costs of the technical (vocational) program was in this case more than 3 times the unit cost of the Arts program. For comparison, the Science program was more than twice the unit cost of the Arts program. However, there was not much difference between the business program and the general arts program. Both are taught to ‘large classes’.

### 3.4.3 Botswana

In Botswana, the BCS estimate indicate that agriculture is a relatively low cost vocational subject, while fashion and fabrication is highly expensive (mainly due to differences in class size). If English is used as a measure rod, the very cost ratios in Botswana might be something like the following for other subjects per annual student ‘place’:

Mathematics	1.1
Science (lab)	1.4
Agriculture	1.4
Design and Technology	2.6
Computer Studies	3.4
Food and Nutrition	3.1
Fashion and Fabrication	4.0

Source: Weeks, BCS: 30

Among these subjects in Botswana, class sizes vary greatly. ‘Normal’ class sized in main academic subjects are about 40 students. The size for the subjects in Table 5 range from close to ‘normal’ in the case of Science (35) and agriculture (30), to intermediate in the case of Design and Technology (20) and Computer Studies (20), to less than ‘half-classes’ in the case of Food & Nutrition (16) and Fashion & Fabrication (12).

.....

There will be differences among Ghana, Kenya and Botswana as to level of equipment and the structure of teacher pay, especially since Botswana is a country with a distinctly higher GNP per capita than the others. The tables should not be seen as necessarily representative of schools in each country. Nor have the cost estimates been arrived at in the same way (The procedures are explained in each case study).

Since the costs of vocational subjects usually are distinctly ‘high’, with few exceptions, it is especially important to assess the cost implications of decisions to invest in such subjects—not merely facilities and equipment, and other tooling up expenses

(e.g., new teacher training), but also the long term recurrent costs which can be daunting if subjects require groups.

Inevitably, high costs should raise the question whether the investment in such subjects is worthwhile. It is widely acknowledged that attempts to measure benefit streams in money terms, lead to very imprecise estimates. In the absence of reliable benefit estimates, estimates of cost relativities are useful because they help narrow the range of what policy makers need to pass judgment when they weigh pros and cons about investments in vocationalized secondary education.<sup>25</sup>

### **3.5 Outcomes and impact**

#### **3.5.1 Learning outcomes**

Very little systematized information is available about what actually is learned in *learned* in vocational subjects in African countries.

Pass rates are available. For example, in Botswana, there was in 2001 dramatic variation among vocational subjects with regard to pass rate and the rate of ‘Credit’ awarded (Weeks, BCS: 22, Table 6). Such variation is also found among academic subjects (BCS:23, Table 7); and it does not seem to be generally ‘easier to pass’ in vocational subjects.

If an exam is well designed, pass rates and rates of credit awarded will indicate something about whether students meet what the examiners think are standards of adequate performance, but they will not convey much information the extent to which the objectives of vocational subjects are actually achieved—especially not when assessment is not criterion referenced.

The work under way to map the quality of learning outcomes in Southern Africa (SACMEQ) is yet to address vocational subjects. Testing of criterion-referenced performance objectives could be developed but would require that curricula also were stated in terms of such objectives, and it would still leave process goals rather elusive. Any direct measures of what is learned were not available to the Case Studies.

#### **3.5.2 Do attitudes need improving; and does vocationalization improve them?**

The few empirical studies which have examined secondary school students’ occupational aspirations and expectations in African countries find no ‘aversion to practical or technical work’ though obviously students will prefer better work with better pay and job security within a given ‘practical’ or ‘technical’ occupational sector. Nor did Foster’s (1965) now classical study from Ghana in the late 1950s showed lack of interest in practical/technical work. Rather, the problem facing secondary school students was lack of realistically available opportunity to obtain such work (in contrast to a career in

---

<sup>25</sup> For example, if a student-hour of a given vocational subject is three times the expense of a student-hour of language or mathematics learning, it stands to reason that if investment in the vocational subject is to be justified, one would need to somehow defend the claim that the greater benefit from a student hour spent on a vocational subject would be proportionate to its thrice higher cost.

primary school teaching for which the opposite was the case). The same finding applied to secondary school students in Kenya in the early 1980s (Lauglo and Närman 1987). But in contrast to Foster's widely cited claim regarding Ghana that curriculum change will not affect attitudes (an inference for which he had no direct evidence), the Kenyan finding was that curricula *can* change attitudes. Substantial donor support for vocational subjects (workshops, equipment, technical assistance) in the Kenyan case may have given these subjects a strength that helped make such effects possible. The context in Kenya was also one of severely constricted access to government jobs for secondary school graduates. Both for Kenya in the 1980s, and Ghana in the late 1950s, one could however argue that there was no need for subjects to be introduced in order to help bring about 'attitude change'—what was lacking was opportunity in practical and technical occupations.

Is there lack of interest among students today, under the conditions of very inadequate facilities and equipment for vocational subjects, which prevail in Kenyan schools today? Very few secondary students in Kenya would prefer to join the informal economy immediately after school—according to Nishimura and Orodho's recent study (1999:55) study, but 44% of 193 students surveyed at the 7 secondary schools in their sample did indicate that their plan/preference was to "join a vocational and technical training institution" and another 8% indicated "join an agricultural institution". Thus, it appears that favorable attitudes to vocational and technical education and training after secondary school, and subsequent work in technical occupations, are probably not in short supply.

Attitudes to work will be shaped by perceptions of the labor market, but these perceptions are not precise—they can be as if through a glass darkly. The great majority of parents of students who took industrial education subjects in the Kenyan secondary schools of the early 1980s had high expectations for the labor market value which 'Industrial Education' subjects could have for their children. (Lauglo 1985 Chapter VII). But unfortunately tracer studies did not confirm that this optimism was well grounded (See 3.5.5, below).

The present case studies had access to no new survey data on attitude change to practical or technical work. But given the great problems which secondary school graduates have in finding any kind of livelihood, one would expect that 'lack of interest' in practical or technical work is not a major problem in these countries—and that even more strongly than in the past, lack of opportunity and of skills and other resources needed to make use of existing opportunity, is the problem.

### 3.5.3 Does vocationalization lead to interest in self-employment?

Research in Ghana by King and Martin (2002), which is discussed in some greater detail in the GCS, indicates that vocationalization can play a part in developing supportive attitudes and interests for *entrepreneurship*-- mental readiness to make a living by entrepreneurship and preference working in for private sector. Whether such short-term effects on motivation are sufficient to shape efforts in the long run is uncertain. Self-employment, when it does occur, tends to come after years of experience from first having been employed by someone else, benefiting from skills, capital and

contacts gained during employment. But it does appear that in Ghana, exposure to vocational subjects can stimulate interest in eventually becoming self-employed.<sup>26</sup>

Sheldon Weeks notes about Botswana that the transition to self-employment usually follows working for one's parents or relatives on their land or in their business (formal or informal). There will often be a long wait before a person becomes self-employed by taking over the family farm or business under such circumstances.<sup>27</sup>

It is also an open question whether having taken vocational subjects in secondary school will make future entrepreneurs more successful—even if such subjects may have a short term motivating effect. But more schooling generally helps. There is at least one study (from Madagascar) which shows that micro-entrepreneurs with higher levels of education are more successful in their business than those with less schooling (Lane and Peresson 2000).

#### 3.5.4 Does 'enterprise education' help prepare entrepreneurs?

A separate review has recently been carried out by Farstad on enterprise education (Farstad 2002). It involved field studies in Botswana and Kenya as well as in Uganda. That study focused on entrepreneurship education offered to students in schools or specialized vocational training centers.<sup>28</sup> The study describes the structure and contents of enterprise education. It also notes the lack of cost analysis on enterprise education components. More important, no findings could be located regarding the outcomes and impact of such education—at least not in the African context.

Farstad's study notes that enterprise education targets students and trainees in specialized pre-employment vocational education and training (rather than in the milder varieties of vocationalized secondary education). The teaching *of* enterprise seems to require that it be tied to some particular technical activity (farming, retail business, craft). Teaching *about* enterprise can of course also be part of social studies.

There is a common-sense case for considering learning of such skills as keeping accounts, marketing, costing of jobs and other basic elements of business arithmetic. Such skills are manifestly needed in many of those occupations which are characterized by small firms, both by those who eventually become self-employed as well in supervisory employed work.

In the case of vocationalized education (a few hours per week in a vocational or practical subject) there will necessarily be less time than in vocational training to include such skills and less depth of technical skill to which entrepreneurial education could be tied, than in specialized vocational training. Since little or no research appears to have been carried out on the impact of 'enterprise education' as taught to students in formal

---

<sup>26</sup> Obviously, self-employment in the modern sector is the preferred choice. A livelihood in the informal economy is an option of last resort.

<sup>27</sup> Comments from Sheldon Weeks on draft text.

<sup>28</sup> It did include not training and related services aimed at those who already are micro-entrepreneurs. The reason for this restriction of scope was simply that more was previously known about training offered as part of support packages for micro-enterprises. Like the present review, Farstad's study was commissioned by the Human Development Department of the Africa Region of the World Bank, as part of the Regional review of vocational skills development.

education or training institutions—at least in Africa, the question of effectiveness must be left open.

### 3.5.5 Does vocationalization ease transition to work?

One would expect that the answer to this question depends both on the depth of skill acquired and on market demand for these skills. What can seem to work well in a buoyant labor market will not be generalizable to a severely depressed labor market. To ease transition to work, a certain minimum level of skill is needed, and it is necessary that the level of skill mastery is communicated efficiently to those who are hiring. Since time-consuming and usually relatively expensive research designs are needed to assess impact (especially tracer studies) research on the labor market benefits which derive from particular curriculum combinations in school, are internationally rare.

#### What is achieved by vocationalization under favourable conditions compared to Sub-Saharan Africa: Research on the case of the US high school

The US high school is very much an institution in which students follow a curriculum that is mainly ‘general’. Vocational subjects, when they are taken, typically constitute a minor portion of a student’s total curriculum. Thus, vocationalized secondary education is a fairly common phenomenon in the USA. The US high school is of course much better resourced and the labor market is much more favorable for high school graduates than in African countries. But for that reason, the US high school may be an instructive case about the limitation to success which still apply under seemingly very favorable circumstances. The US high school is one of few ‘Northern’ systems in which there is a body of research on the labor market impact of ‘vocationalization’.

For those who entered the labor market after high school rather than continuing their education, the research in the 1980s seemed to find little or no labor market benefits of having had even quite substantial (30%) exposure to vocational courses (for those who had been in high school in the 1970s). But there was very one major exception: Clerical skills (office practice skills) had a clear payoff in terms of higher income—for girls but not for boys (Meyer 1982). It stands to reason that such skills as writing business letters, typing, keeping records, basic accounting would confer advantage. The labor market for such skills was strongly gender structured but also large. It seems that such ‘office skills’ bear considerable resemblance to much other school learning (basically skills in manipulating symbols). The teaching of such skills also seems quite compatible with other mainstream teaching work—it should be relatively easy for school settings to mimic the logic of office work. At present computer skills have become essential for both ‘office skills’ as for a range of other work and learning settings.

More recent research in the US, reviewed by Bishop in 1995 (1995:60-66), has generally yielded more positive results than research in the 1980s, for both males and also in other fields than office skills—and especially for a depth of skill that exceeds what is learned by exposure to a few courses of a couple of contact hours per week. Crucially, however, in terms getting a better wage than one otherwise would have had, the benefit from vocational courses depends on actually being able to obtain a ‘training-related job’ to begin with; and most graduates who enter the labor market after high school do not find work for which the vocational courses which they have taken, appears

to be broadly relevant. The connection between vocational courses and the work which students later find, is distinctly loose.<sup>29</sup> This looseness will be even more striking in the case of those who continue to higher education.

### Developing countries

Few studies have been done in Africa. But the consistent impression is one of distinctly loose or non-existent coupling between a particular vocational bias in secondary education and finding 'related work' in the next few years after completing secondary school. As noted, this is not unique to the African experience, but such looseness is probably accentuated by depressed labor markets.

Psacharopoulos and Loxley (1985) carried out a tracer study in Tanzania (and Colombia) that compared students from 'mildly vocationalized' tracks of secondary education with students from purely academic tracks. Estimating the internal rate of return to investment, they found lower returns to the vocational tracks than to the academic ones. In addition, and more convincingly to skeptics of rate of return analysis, they showed that the vocationalized course conferred no advantage over academic ones, in obtaining employment.

Närman and Lauglo conducted a tracer study on graduates in 1986 from five Kenyan technical secondary schools which had a mainly academic curriculum but with 1/3 of the timetable devoted to theory and practice in technical subjects (Närman 1988, Lauglo 1989).<sup>30</sup> When traced approximately one year after graduation, only 15% of the graduates had either continued to 'relevant' further training or found a job for which their technically biased secondary education could be said to have been broadly preparatory. The vast majority were either continuing to further general education (39%) or they were unemployed and looking for either work or some opportunity for further education or training (42%). Only one person was self-employed. None had obtained an apprenticeship even though preparation for apprenticeship was one of the declared objectives of this type of school..

In the Kenyan study on Industrial Education (IE) subjects (here there was less time for vocationalization—3 to 5 periods per week), the results from the tracer study were more starkly disappointing. After one year roughly 4/10 of a sample traced was continuing in academic education. Roughly 4/10 remained unemployed. Only 5% had had secured further training of a kind for which the IE subjects was broadly relevant (Lauglo and Närman 1987). In the IE study it was also possible to compare those who had taken industrial education for 4 years with those who had only 2 years exposure, and those who no IE. Having had IE (or more IE) did not help ease the transition to work. However, the Kenyan IE-studies did show a wide range of episodic and private use of

---

<sup>29</sup> This problem is not unique to vocationalized secondary education. It also applies to the learning of vocational skills in greater depth. The pattern of research findings also from vocational training systems widely thought to be 'advanced' suggests that when vocational training is provided on a mass scale, it will have relatively loose couplings with the type of job which those trained later will be doing. In the 1980s, roughly half of those trained in school-based vocational training in Sweden, or in apprenticeship based training in Germany, would a couple of years after their training be found in jobs which not even broadly 'training-related' (Lauglo 1993).

<sup>30</sup> (71 % response rate, N= 480),

skills acquired—e.g., “fixing things” at home, helping friends or neighbors, but not any impact in terms of finding more regular work.

A three-year tracer study was also conducted (Närman 1988). Again, there was no association between greater previous exposure to IE subjects, and having a job. More worryingly, the overall percentage of those who had neither found work nor been able to continue in school, had not declined since the one-year tracer.

Clearly, vocationalization had not served as an effective means to ease the transition to work. Nor was it a path to self-employment. Nor did it serve as a path to ‘related’ subsequent vocational training in greater depth, except for a minute minority.

*It should be noted that these disappointing results contrasted with the high optimism which both students and parents then had, about the usefulness of skills acquired in IE, as ‘something to fall back on’ in order to make a living.* There has been no recent duplication in Kenya of the earlier tracing of students into the labor market. But there is a more recent survey of students who were still in school. As in the earlier research, this conveys an impression of optimism about the usefulness of vocational subjects.

The 1999 study in by Nishimura and Orodho (1999:50) include samples of students and teachers from 7 secondary schools in five provinces. Students were found to be strikingly more optimistic than their teachers in their judgment as to whether their vocationalized curriculum prepared them well for the world of work. A clear majority of students gave favourable ratings in this respect. However, 8/10 of the teachers disagreed—and thought the curriculum gave little or no such preparation. Most teachers also noted that the purportedly vocational subjects ended up being too ‘theoretical’ to give adequate preparation for the world of work.

In the IE studies, the quality of school credentials (passing the exam, the grade/mark obtained) did not seem to improve a person’s chance of finding work (Lauglo and Närman 1987). Under such circumstances, it is hardly surprising that IE failed to make a difference. It appears that in labor markets with staggeringly high rates of youth unemployment, such as Kenya since the early 1980s, finding work is likely to depend strongly on networks and sponsorship strongly, thus making credentials count for little.

It is likely under more favourable labor market conditions, that for ‘economic relevance’ to be more than a hope, skills need to be taught to greater depth. Chin-Aleung (1988) conducted a study in Trinidad-Tobago at a time when there was brisk demand for skilled workers in that country. Vocationalized secondary education that included a minor portion of the timetable failed to have any clear effect on the chance of finding employment, *but institutional training in greater depth in comparable areas of trade, did improve the prospects of employment.* Similarly, a study in Eritrea by Atchoarena and Tekie (1997) which was also conducted at a time (1996) when demand for skilled labor was brisk, showed high transition to ‘related work’ among graduates from technical secondary schools. In these schools the vocational subjects received about 50% of curriculum time. It seems as if interaction is needed before vocationalization will work: a relatively buoyant labor market combined with deeper training in vocational skills than what vocationalized secondary education usually entails.<sup>31</sup>

---

<sup>31</sup> The Eritrean technical secondary school is a borderline case between vocationalized education (in which the curriculum still is mainly academic preparatory) and school based vocational training. The timetable is 50% vocational and 50% academic and the total of 50 periods a week (plus homework) is an unusually heavy load.

No new tracer studies were reported in the reviews carried out by country case studies. In Botswana tracer studies were called for in the Revised National Policy on Education in 1994 but regrettably no study has been done. Nor do the case studies report any outreach activities carried out by the schools to cultivate labor market links. In Botswana five (of 27) senior secondary schools had once been part of the Education with Production movement which used to be strong on outreach (and community involvement). Next to nothing is left of this earlier outreach today. Rather, there is a shift to greater emphasis on guidance and counseling (Careers Centers at each secondary school), but no evaluative information about how such services are functioning.

In Ghana many persons close to schools assume that ‘economic relevance’ argument for vocationalization is valid. This was the case for the overwhelming majority of senior secondary teachers interviewed by the GCS. However, as shown above, the Kenyan case from the 1980s show there can be a wide gap between expectations and reality on this question, in the context of highly depressed labor markets. There has been no empirical study of actual effectiveness in Ghana to test the ‘economic relevance’ argument.

The KCS notes an impression that top students in computer and business studies find good employment even while still in secondary school, and that some of those who join university do part time work in ICT. But this would be very small numbers from the total number of graduates who had experience of practical subjects while secondary school students.

*To conclude: So far no tracer study has shown that vocationalization implemented on a large scale in developing countries confers an advantage in access to employment (let alone self-employment) under conditions of highly depressed labor markets for youth. Under generally favorable labor market conditions, in order for vocational subjects to give a labor market advantage, a tentative conclusion would be that a greater depth of skill is needed than ‘thin provision’ of vocational subjects (e.g., 3-5 periods per week).*

### 3.5.6 Does it lead to related further training?

For vocational subjects in secondary school actually to open for access to related further education and training, receiving institutions would need to give some favored consideration to applicants who have had vocational courses previously. In highly competitive selection processes, good grade point averages can drive out other criteria.

*In Zimbabwe, Bennell and Nyakonda (1992) followed up in 1990 the cohorts who had graduated from vocationalized secondary education programs at a single school—St. Peter’s Kubatana, since 1980. In the early 1980s—shortly after Independence, when, when opportunity was opening up for young Africans in many fields which previously had been closed to them, the vocationalized secondary program was an effective (but very expensive) way of gaining favorable places in the rapidly growing training queues for craft and technician apprenticeship. Half of the ‘vocational’ graduates succeeded in obtaining access to such training. But these effects were not sustainable as access to apprenticeship became much more competitive. By the 1980s, having had a technical secondary school background, rather than a purely academic one, no longer seemed to give advantage (p. 61).*

The impression is that in the selection to ‘related’ forms higher education, any system-wide favored treatment of a background in vocational subjects is rare in African countries. Kenya is an exception. Other things being equal, good performance in the vocational subjects improves a student’s chances of enrolling for specific degree programs in related fields. Business studies courses are considered for those likely to enroll for the commerce degree. The computer studies course is useful for those who like to study computer science. Home science is a necessity for those who like to pursue a bachelor of education degree in home economics. Type writing with office practice counts for selection to the bachelor of education course in secretarial studies. Electricity is considered for those keen on electrical engineering, and metalwork and power mechanics are useful for those interested in other branches of engineering. Drawing and design are valuable for students keen on pursuing architecture related degree programs as is building construction and woodwork. Finally, a high score in agriculture will place students at an advantage if they apply to a bachelors degree in agriculture.

All these subjects also add points for specific subject clusters in which potential degree applicants have to obtain a minimum total score in addition to the minimum overall grade point average needed in order to be considered for university (Mwiria, KCS 41-42). These features of the Kenyan system probably help vocational options attractive to students (see chapter 3.5.2)—in spite of the currently weak provision of resources for these options. But notwithstanding such favored treatment, it is likely that only a small proportion of secondary school students who take KCSE exams in vocational subjects, will gain access to higher education and make use of their vocational specialty in their higher education studies.

In Botswana, the colleges of education, which have highly select entry, do try to take performance in vocational subjects in the secondary schools, into consideration when they screen applicants for teacher training in the same subjects. However, the College of agriculture pays little or no attention to performance in agriculture, preferring instead to go by performance in the natural sciences, English, and mathematics. Nor does the Faculty of Engineering at the University of Botswana give any special recognition to performance in Design and Technology. However, recommended practice in Botswana is that if two students are equal in all other respects, the preference could go to the one who had also excelled in a relevant practical subject.

In Ghana, vocational subjects at Senior Secondary level do not help open the door to ‘related fields’ in higher education; and the kind of ‘less demanding’ science course which vocational subjects are typically paired with in the curriculum structure, is a barrier for access to higher education.

In Eritrea, graduates from technical secondary schools generally have a good chance of continuing to higher education, compared to students in other schools, but this is because of the performance of these students in *academic* subjects, and the vocational subjects the students have taken are accorded no importance at selection—they are not even externally examined (though they constitute about 50% of the curriculum in these schools). There is no recognition of a ‘technical school’ background at selection to the engineering faculty.<sup>32</sup>

---

<sup>32</sup> Selection to the engineering faculty occurs after a first foundations year at university, and is entirely based on grades achieved in that year. Other forms of further technical education which are not part of the university, may however give extra consideration to the graduates from these

Even in countries where some special recognition is given to a vocational background in access to further post-secondary technical or higher education, there is reason to expect that only a very small proportion of secondary school leavers would get access to such opportunity—because of the generally highly competitive selection to such further and higher education. The case studies could locate no data on this, however.

How well *justified* it would be to give an advantage at selection (as in Kenya) will depend on whether privileged access leads to better performance in the types of further training and studies in question—as compared to performance by others who have gained access by other routes. Impressions from Tanzania are that graduates of technical secondary schools do have a temporary advantage in engineering studies in higher education, but that they are eventually overtaken by others with stronger foundations in science and mathematics.<sup>33</sup> However, no empirical study is known to exist on this issue .

#### 4. CONCLUDING OBSERVATIONS AND RECOMMENDATIONS

##### 4.1 Observations

It is strongly emphasized that all the country case studies are substantial pieces of research in their own right, and rich in commentary and description on the ‘workings’ of vocationalization in the respective countries. Only a small portion of their research contribution is made use of in the present part of the report. Readers are strongly urged to consult them in order to get insights into the country specific experience with vocationalization in these three countries.

Vocational subjects within a secondary curriculum that remains mainly general, can have their uses in private lives (e.g., agriculture, handicrafts, domestic science, accountancy). Further, learning practical skills can be justified as part of well rounded general secondary education.

However, the main rationale in Sub-Saharan countries which have introduced such subjects has been the hope that inserting such subjects into the mainstream of secondary schooling would ease the students’ transition to the world of work. The key policy issue has been to find *an educational response to the very great difficulty which school leavers have in finding work*. In terms of this key policy concern, the record of vocationalization is bleak. There are also major shortcomings in terms of gender balance in many vocational subjects, and the capacity to finance and implement vocationalization on a large scale.

- Exposure to vocational subjects may enhance interest in the types of work for which these subjects are broadly preparatory. When there is great dearth of modern sector job opportunities for youth, it may even create interest in self-employment in the longer run. Also, there is no iron law which says that vocational subjects are doomed to be unattractive to their clientele. But the key indicator should be whether they are worth their cost and complexity in terms of

---

secondary schools--like Kenya in the early 1980s, where some special consideration was given to the relatively ‘heavily vocationalized’ technical secondary schools (35% of the curriculum), at admission to certain forms of technical-vocational further training.

<sup>33</sup> Personal communication from Richard Johanson (consultant to the World Bank).

actually easing the difficulty which secondary school graduates have in finding a livelihood.

- No study has shown that the kind of secondary school vocationalization which affects a minor proportion of the students total curriculum—e.g., 5 class periods a week, or even 1/3 of the time table, gives an advantage in finding work (let alone self employment) within the first year or first few years after leaving school—under severely depressed labor markets for youth.<sup>34</sup> However, though African research is lacking, the grounds for expecting some labor market advantage would be strongest for those vocational subjects whose contents and mode of acquisition most resemble other school knowledge—basic business and office skills.
- No strong effect on actual access to relevant further technical training have been found—notwithstanding the ‘prevocational’ part of the rationale for vocationalization.
- The majority of vocationalization variants are much more costly per student class-period than mainstream general education subjects, mainly because of smaller classes and greater expense on facilities, equipment and consumables. Unless a course can be taught to a full class of students (few can), running costs will be more than twice that of non-laboratory academic subjects. But *some* vocational subjects are not much more expensive than academic subjects (and cheaper than any academic subject taught as a half class). Business studies and agriculture are examples.
- Enrollment in some vocational courses are very strongly gender biased and reflect traditional gender stereotypes. Examples are industrial arts type subjects or subjects related to housekeeping.
- Given the under-funding of vocational subjects in Ghana and Kenya, the case studies for these countries are, as might be expected, generally pessimistic about the condition of vocationalization. The Ghana study notes a dualism (which also is traceable in the international literature on vocationalization): On the one hand, policies are driven by hope--there is a widespread support for making schools more ‘relevant’ for economic life and widespread conviction that this should be reflected in the curriculum. On the other hand a closer scrutiny of attempts to vocationally, shows high costs, weak implementation and absence of attempts to trace impact in terms of what is the declared the key concern (easing transition to the world of work).
- In Botswana the government is in a much better position than nearly all other African countries to finance and implement vocationalization. It has chosen to make very major investments which are under implementation at present. One can also safely assume that the labor market for secondary school graduates is less depressed than in other countries in the Region. This strong political commitment is not accompanied by any studies that assess the impact achieved.
- All three case studies underline the vocational relevance of what they varyingly call ‘key skills’ (the BCS), communication skills (the KCS), or generic problem

---

<sup>34</sup> Studies impact are admittedly few and far between; and governments which have pursued vocationalization policies since the 1980s have not commissioned impact studies that have addressed their key policy rationale.

solving and creative skills (Akyeampong, GCS) and see it a major challenge to teach such process skills across subjects.

## 4.2 Recommendations

These general recommendations are offered on the basis of the case studies and other sources reviewed:

### 4.2.1 Is vocationalization advisable?

The general lesson is that educational policy on vocationalization must be rooted in what schools are able to achieve rather than what one would like them to achieve under ideal circumstances. It must also be rooted in assessment of resource requirements—not just the financing of subjects which in most cases are costly--but also the human and organizational resources needed to mount subjects which usually have demanding staffing and logistics requirements. This means that what may be advisable for countries with well-functioning and well-resourced secondary school systems may make little sense in systems in urgent need of quality improvement in core general education subjects and in which financial and human resources needed to develop and sustain vocational subjects are extremely scarce. Thus, the weight given to the general education function of practical subjects will be a matter of a matter of prioritizing bearing in mind serious cost and implementation constraints. In a context where only a small minority of the age group goes to secondary school, which is the case throughout Sub-Saharan Africa, the case for incorporating some vocational skills training within a comprehensive type of school catering to the whole age group and to varied career prospects, will be much weaker than in the high-enrolment systems of the North.

Given that secondary education in Sub-Saharan African countries typically is in urgent need of quality improvement in core general education subjects (language, math's, science) and given the high cost of vocationalization and the complexity of inputs required for nearly all vocational subjects, it is hard to see a strong enough case for putting vocational subjects high up on the priority list for the medium term development of the *general education* curriculum for secondary schools. The question is not whether vocational subjects can be a valuable complement to other subjects as part of a well-rounded secondary education one would wish all students to receive, the question is rather whether it is affordable and worth the time and effort which it would deflect from existing subjects that are in strong need of quality improvement.

In terms of vocational skills development, the case is distinctly weak, because in addition to the noted cost and implementation constraints, vocationalization policies have not been shown to be an effective means to alleviate school leaver unemployment. Minor portions of a predominantly academic secondary-school education will not suffice to give skills training which have labor market credibility, let alone skills which serve as an basis for self-employment.

To meet the need for vocational skills development, it is better to look to institutions specialized for training purposes--which are set up to respond to the labour market rather than being mainly set up to prepare for higher stages of education.

#### 4.2.2 Process skills matter

The capacities which are most generally valuable for the world of work are also valuable for life in general, and thus key objectives for general education. Examples are initiative, drive, responsibility, creativity as well as more concrete generic skills of being able to communicate clearly, work collaboratively in teams, solve problems. These capacities and skills are developed by *ways of working* across subjects, rather than by the taught contents of any particular subject—academic or practical. Improved economic relevance is also likely to be achieved by enhanced learning of oral and written communication skills and of practical arithmetic. Skills that to be developed for entrepreneurial education (as well as enterprise mindsets just mentioned) can also be taught within the context of general education subjects —especially some needed practical arithmetic skills. The task of quality improvement in African secondary education and the task of improved economic relevance of that education thus coincide.

#### 4.2.3 Criteria for choice of practical/vocational subjects

The main message in this paper has been a note of caution about the case for introducing vocational subjects as part of mainstream secondary education--given the doubts about the cost-effectiveness of many subjects in relation to the main policy rationales which drive interest in such subjects. If nonetheless, such subjects are to be introduced--and bearing in mind that ‘labor market relevance’ will not be only objective which such subjects are intended to serve, these are criteria that might be useful in deciding on what subjects to offer:

- that the subject should have relatively low cost
- that what is learned will be useful in large occupational segments that secondary school leavers have a high likelihood of entering
- usefulness in one’s private life
- good prospects for reasonably balanced enrolment of women and men,
- that the practice needed to teach and learn the vocational skill concerned will be compatible with the dominant ‘logic’ of work in schools.

In the country case studies in the present review, agriculture and business studies seem to meet these criteria reasonably well. They are relatively low cost; they aim at relatively wide occupational segments; they can have their uses in private life; and they are reasonably gender balanced in their enrolments. Certain practical skills within business studies that can be taught much like other school subjects. Accounts, business correspondence are examples.

#### 4.2.4 A special case for ICT skills

Notwithstanding the strong note of caution in 4.2.1, above, the teaching of computer applications is a special case because the importance of ICT in the global economy and because of the rapid spread of computer applications as a tool for communicating and learning generally. The question in African education is *not whether* computing skills need to be taught, *but how soon* it will be affordable and practicable to introduce such

teaching, *and in what ways* ICT skills should be introduced—not only in higher education, but also extending their introduction in the next instance to secondary schools.

Viewed as *vocationalization*, computer skills have the advantage of increasingly being applicable across occupations--admittedly only in the modern sector and the niche of application may at present be quite small, but it is bound to increase. ICT equipment also allows the teaching of various commercially-oriented programs (keyboard skill, word processing, spread sheets).

. There are well known constraints which may make the introduction of computer applications a seemingly remote objective in the secondary schools of most African countries: lack of electricity and high costs when electricity is provided, high costs of software, problems with maintenance of equipment, lack of qualified staff, use of internet access being barred by lack of access to adequate telephone connections and high telephone charges. That lack of qualified staff is a major constraint even when facilities and equipment can be afforded, is already a major lesson from Botswana which has had the financial resources to seemingly overcome other barriers. A long term view is therefore needed for providing secondary schools with ICT technology, but this can be combined with short term encouragement of small scale efforts. The teaching of computer applications is also very much a specialty of private proprietary computer schools—something which provides opportunity for private-public collaboration.

Botswana is the only country in Sub-Saharan Africa which has embarked upon system wide implementation of computer education in public secondary schools, using a two-pronged approach of ‘computer studies’ and ‘computer awareness’. Given the lack of any long-term experience from any similarly ambitious implementation in other developing countries, other African countries can learn by staying informed about the Botswana experience.

#### 4.2.5 General implementation advice

In implementing any practical subjects, it will be important to:

- Implement systematically (as in Botswana) rather than by attempts to do so precipitously (as was the case in Ghana and Kenya)
- Work towards a shift in pedagogy which emphasizes problem solving
- Give substantial emphasis to continuous assessment
- Avoid gender biases in overall provision
- Analyze and weigh cost implications before going to scale
- Evaluate learning outcomes and impact.

## References

In Part One, reference is made to the three case studies in Part Two, using these abbreviations:

**BCS** (The Botswana Case Study by Sheldon Weeks)

**GCS** (The Ghana Case Study by Albert K Akyeampong)

**KCS** (The Kenya Case Study by Kilemi Mwiria)

- Ampiah, J. G. (2002) *Attitude of Junior Secondary School Boys and Girls Towards Science*. Institute of Education, University of Cape Coast (Unpublished paper—cited by Akyeampong in the present Ghana case study)
- Anderson, John (1970) *The Struggle for the School. The Interaction of Missionary, Colonial Government and Nationalist Enterprise in the Development of Formal Education in Kenya*. London: Longman.
- Atchoarena, David; and Tesfa Mariam Tekie (1997) *Skill Development and Labour Market Study in Eritrea. Report of the Tracer and Enterprise Surveys*. Ministry of Education (in collaboration with International Institute of Educational Planning, UNESCO).
- Bacchus, Kazim (1988) The Political Context of Vocationalization of Education in the Developing Countries. In Jon Lauglo and Kevin Lillis (EDS) *Vocationalizing Education. An International Perspective*. Oxford: Pergamon.
- Bennell, Paul; and David Nyakonda (1992) The vocational school fallacy revisited: the post-training experiences of secondary technical school graduates in Zimbabwe. *Education with Production*, 9 (1): 53-68.
- Bishop, John (1995) *Expertise and Excellence*. School of Industrial and Labor Relations, Cornell University. Working Paper 95-13.
- Canagarajah, R. S *et al.* (1997) *Child Labor and Schooling in Ghana*. World Bank.
- Chin-Aleong, Maurice (1988) *Vocational Secondary Education in Trinidad and Tobago and Related Evaluation Results*. Pp. 293-334 in Lauglo and Lillis (1988).
- Coombe, Carol (1988) *Survey of Vocationally-oriented Education in the Commonwealth*. London: Commonwealth Secretariat.
- Farstad, Halfdan (2002) *Integrated Entrepreneurship Education in Botswana, Uganda and Kenya*. Report of a study commissioned by the World Bank. Teknologisk institutt (National Institute of Technology). (Revised draft. September 2002).
- Foster, Philip (1965) The vocational school fallacy in development planning. In C. Arnold Anderson and Mary Jean Bowman (Eds), *Education and Economic Development*. Chicago: Aldine.
- Cumming, Christopher E (1988) Curriculum Costs: Vocational Subjects. In Lauglo and Lillis, *Vocationalizing Education*.
- Cumming, Christopher E (1985) "The Contribution of Cost Studies." Pp. 77-107. In Cumming, C., Martin Davies, Kevin Lillis, and Ben Nyagah (1985) *Practical Subjects in Kenyan Academic Secondary Schools. Background papers*. Stockholm: SIDA, Education Division Documents No. 22.
- Hoppers, Wim (1996) *Searching for relevance: the development of work orientation in basic education*. Paris: International Institute for Educational Planning. Fundamentals of Educational Planning No. 52.
- Kaluba, L. Henry (1986) *A Tracer Study of Grade 12 Graduates from David Kaunda and Hillcrest Secondary Technical Schools*, Lusaka: University of Zambia.

- Educational Reform Implementation Project, School of Education, University of Zambia.
- King, Kenneth; and Chris Martin (2002) The Vocational School Fallacy Revisited: education, aspiration and work in Ghana 1959-2000. *International Journal of Educational Development*, 22 (No 1):5-26.
- Lane, Julia I.; and Jean-Paul Peresson (2000) “*Skills Development in Madagascar: Background and Potential Approaches*” [Washington: the Urban Institute: Unpublished paper prepared for the World Bank].
- Lauglo, Jon (1993) *Vocational training: analysis of policy and modes*. Paris: International Institute for Educational Planning.
- Lauglo, Jon (1989) Technical secondary students in Kenya: Origins, achievement and destinations. *Prospects*, 19 (No 3).
- Lauglo, Jon; and Kevin Lillis (1988, Eds.) *Vocationalizing Education. An international perspective*. Oxford: Pergamon Press in association with the Swedish International Development Association.
- Lauglo, Jon; and Anders Närman (1987) The Status of Practical Subjects and their Uses after School. Diversified Secondary Education in Kenya. *International Journal of Educational Development*, 7 (no 2).
- Lauglo, Jon (1985) *Practical subjects in Kenyan academic secondary schools. General report*. Stockholm: Swedish International Development Authority. Education Division Documents, No. 20.
- Lillis, Kevin (1985) 'Constraints on the implementation of diversified curricula: a review of experience in developing countries', In Cumming, C., Martin Davies, Kevin Lillis, and Ben Nyagah (1985) *Practical Subjects in Kenyan Academic Secondary Schools. Background papers*. Stockholm: SIDA, Education Division Documents No. 22.
- Meyer, Robert (1982) Job Training in the Schools. In R. Taylor, H Rosen and F. Pratzner (Eds), *Job Training for Youth*. Columbus: The National Center for Research in Vocational Training, Ohio State University. [Cited by Bishop 1995]
- Nishimura, Mikiko; and John Aluko Orodho (1999) *Education Vocational and Technical Training and Employment: Designing projects that link education and vocational training and employment in Kenya*. Nairobi: Japan International Cooperation Agency-JICA.
- Närman, Anders (1988) Technical secondary schools and the labour market. Some results from a tracer study in Kenya. *Comparative Education* 24 (no 1).
- Närman, Anders (1988) *Practical subjects in Kenyan academic secondary schools. Tracer study II (three-year follow-up)*. Stockholm: SIDA. Education Division documents No. 39.
- Oxenham, John (1988) What do Employers Want from Education? Pp. 69-80 in Lauglo and Lillis, *Vocationalizing Education*.
- Psacharopoulos, George; and William Loxley (1985) *Diversified secondary education and development: Evidence from Colombia and Tanzania*. Baltimore: Johns Hopkins University Press.
- Urevbu, A. O. (1988). Vocationalizing the Secondary School Curriculum: The African Experience. *International Review of Education*, 34 (No 2).
- World Bank (2002) *Eritrea Education and Training Sector Note. Report No. 24448-ERI*. Washington: Human Development I, Africa Region.
- Wright, Cream (1988) Curriculum Diversification Re-examined. A Case Study of Sierra Leone. In Jon Lauglo and Kevin Lillis (1988 Eds.) *Vocationalizing Education*.



I.