



A Sustainable Open Schooling System for GHANA

*Report of a Short-Term Consultancy to devise strategies for the
Centre for National Distance Learning & Open Schooling (CENDLOS)*

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Du Vivier, E. *The Open Schools Handbook: A resource guide for managers*. CC-BY-SA Commonwealth of Learning, 2009.

Du Vivier, E. *Costs and Financing in Open Schools*. CC-BY-SA Commonwealth of Learning, 2008.

Du Vivier, E. & Ellis, J. 'Formulating policies to enable the development of Open Schooling', Chapter 2 in Abrioux & Ferreira (eds.) *Open Schooling in the 21st Century*. CC-BY-SA Commonwealth of Learning, 2009.

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Terms of Reference

The terms of reference for this assignment were to:

- 1) Review existing programmes and plans for providing education for out-of-school learners in Ghana, by:
 - interviewing key personnel in the Ministry of Education and the Centre for National Distance Learning and Open Schooling, as well as in other agencies, institutions and organisations;
 - visiting study centres and TVET institutions;
 - studying documentary evidence, including: reports, statistical bulletins and budget documents;
 - meeting with course writers, previewers, evaluators, editors, presenters and learners.
 - appraising existing learning materials, including: pre-recorded video lessons and printed study guides.
- 2) Propose strategies for capacity-building and staff development;
- 3) Advise CENDLOS on best practices in Open and Distance Learning;
- 4) Assist CENDLOS in devising modalities for rolling out a sustainable Open Schooling programme throughout Ghana;
- 5) Advise on the most appropriate structure for CENDLOS and possible collaboration with COMOSA or allied agencies.

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*Ed Du Vivier
Maseru, LESOTHO
14 December 2010*

Abbreviations & Acronyms used in this Report

BECE	Basic Education Certificate Examination, taken at the end of Junior High School
CBO	community-based organisation
CENDLOS	Centre for National Distance Learning & Open Schooling
CODEL	proposed Council for Open, Distance & e-Learning in Ghana
COL	Commonwealth of Learning
COTVET	Council for Technical & Vocational Education and Training in Ghana
DE	distance education
DVDs	Digital Versatile Discs or Digital Video Discs = external optical media capable of storing at least 4.7 Gb of data or 3 hours of video footage at twice the resolution of standard VHS
GER	Gross Enrolment Ratio = the total number of students enrolled at a particular level in the formal education system, divided by the number of young people in the intended age cohort
GNI	Gross National Income
ICDL	International Computer Driving Licence
ICTs	information and communications technologies
IEP	Internet Exchange Point
ISP	Internet Service Provider
JHS	Junior High School (equivalent to Grades 7-9 in a K-12 system)
LAN	local area network = an installation of interlinked computers at a single location (e.g. a school)
LS	learner support
MDAs	ministries, departments and agencies established by the Government of the Republic of Ghana
MoE	Ministry of Education, Government of the Republic of Ghana (since 2009)
MoEYS	Ministry of Education, Youth and Sports; Government of the Republic of Ghana (2001-2008)
NAMCOL	Namibian College of Open Learning
NER	Net Enrolment Ratio = the total number of students of the intended age enrolled at a particular level in the formal education system, divided by the number of young people in the intended age cohort
NFED	Non-Formal Education Division of the Ministry of Education, Ghana
NGO	non-governmental organisation
NQF	National Qualifications Framework
NVTI	National Vocational Training Institute
ODL	Open & Distance Learning
ODEL	Open, Distance & e-Learning
OERs	Open Educational Resources
pdf	Portable Document Format = a format for computer files that captures a “snapshot” of a document

PSI-DL	The President's Special Initiative for Distance Learning, the predecessor to CENDLOS
QA	quality assurance
SMS	short (text) message service
SHS	Senior High School (equivalent to Grades 10-12 in a K-12 system)
TVEAT	Technical, Vocational & Agricultural Education and Training
TVET	Technical & Vocational Education and Training
VCDs	Video Compact Discs = external data storage media using MPEG-1 file format technology and capable of holding about 74 minutes of video footage at the same resolution as VHS
WAEC	West African Examinations Council
WASSCE	West African Senior [Secondary] School Certificate Examination, taken at the end of Senior High School

Executive Summary

This document is the main output of a short-term consultancy to devise strategies and structures for delivering a sustainable open schooling programme in Ghana. The assignment involved a desktop review of published literature, government reports and internal documents; a ten-day visit to Accra in November 2010 to meet with key stakeholders; and considerable additional reflection to produce this report. The mission was funded by the Commonwealth of Learning on behalf of the Centre for National Distance Learning and Open Schooling (CENDLOS), a newly-established unit in the Ministry of Education.

Section 1 of this report sets the stage by giving an overview of the education system in Ghana, summarising developments in the provision of ICTs in schools and reviewing the accomplishments of the President's Special Initiative for Distance Learning, CENDLOS's predecessor.

The following section examines the statistical evidence to assess the need for a national open schooling programme. Even though attendance at primary and junior high school has been both free and compulsory in Ghana for the last few years, figures provided by the MoE indicate that at least one million children of school-going age are not enrolled in basic education. In addition, over 600,000 adolescents between 15-17 years of age do not attend senior high school. The demand from those who wish to re-sit examinations is also significant, with 188,000 young people who did not sit or failed at least one core subject in the BECE and 77,000 'failures' at WASSCE level. There are also around 30,000 adults who complete the National Functional Literacy Programme each year and who could benefit from an upper primary equivalency programme. In addition, an unknown number of adults who completed their primary education but never attended secondary school may also wish to upgrade their qualifications.

Section 3 presents a systems model for organising the provision of OS programmes, and outlines several sub-systems that are discussed in greater detail in subsequent parts of this report. The following section considers the Regulatory & Logistical Sub-Systems that CENDLOS will need to establish, though these depend upon the path that Government determines for the Centre's future development. Nevertheless, it is desirable that an Interim Development Board be appointed at the earliest opportunity to advise on aspects of the institution's establishment, to provide external governance and to assist in the identification and appointment of senior managerial, technical and administrative staff.

Before self-instructional materials can be developed for any OS programme, it is necessary to determine what relationship it will have to the education provided in conventional schools. The curriculum and syllabus for open schooling can complement the existing system, provide an alternative to it or be fully integrated. To date, the PSI-DL has adopted a complementary and partially-integrated approach, and this should be continued in any national OS programme for Ghana. No changes are proposed in the existing processes used by the MoE's Curriculum Research & Development Unit or the Council for TVET (COTVET), but it is recommended that CENDLOS be more closely involved.

High quality learning materials are central to the success of any open schooling programme, and the relevant issues are discussed in Section 6. Ideally, the functions of materials acquisition, adaptation and/or development, along with their reproduction and distribution, should be the responsibility of a centralised body, and CENDLOS is well placed to continue carrying out this role for a national OS programme.

By contrast, learner support functions are best provided at local level, so that OS learners do not have to travel long distances to avail of academic and administrative services. Several possible options for organising the Learner Support Sub-System for a national OS programme in Ghana are discussed in Section 7. The preferred model is to allow local

schools and other providers to establish their own study centres, while CENDLOS performs quality assurance functions by inspecting and accrediting those that meet or exceed minimum standards. Regardless of which option is chosen, CENDLOS will have a key role to play in building capacity among local providers.

At the end of any course of study, the performance of OS school learners must be assessed and certificated. No changes are proposed to the existing procedures carried out by the West African Examinations Council and COTVET. Many of those who register for Ghana's national OS programme are likely to sit for the same examinations (BECE, WASSCE and TVET assessments) as their counterparts in conventional schools and training institutions. In order to meet the needs of newly-literate adults, it is desirable to devise an Upper Primary Equivalency Programme for delivery through ODL methods. Ideally, the assessment and certification process for this programme should be practically-oriented and competency-based.

Managing a national open schooling system requires more than just OS providers. These requirements are discussed in Section 9 of this report, including a unit within the Ministry of Education to formulate policy and oversee the system, a mechanism for consulting with stakeholders, an acceptable way of funding provision, a mechanism for regulating providers and assuring the quality of the services they provide, and a system for pre-service education and training, continuous professional development and certification of open schooling practitioners.

At present, the future direction and role of CENDLOS is under consideration. The preferred configuration is for CENDLOS to be constituted as the Executive Secretariat of a new Council for Open, Distance & e-Learning (CODEL). CODEL would provide a forum for stakeholders to have an input into plans for the development of this important sub-sector, while CENDLOS would act as a resource and development agency, an inspectorate of local OS providers, and a liaison and coordination body for ICTs in Education initiatives.

Ways of funding a national open schooling programme are discussed in Section 10. Although ODL courses can often be delivered at a lower cost per student than conventional classroom-based education, strict financial controls must be exercised. No matter which option is chosen for CENDLOS's future development, it is essential to avoid the traditional approach used in the civil service to determine staff establishments and post structures. Ideally, only key managerial, technical and administrative posts should be filled on a full-time permanent basis, while other staff should be engaged on temporary, part-time or short-term contracts.

Notwithstanding potential savings, funding a national OS programme for Ghana is likely to involve some form of government subvention. Although revenue may also be generated through the sale of self-instructional materials to individual students or as a substitute for school textbooks, CENDLOS should consider adopting an Open Educational Resources approach, where these materials are available online free to users.

It is expected that cost-recovery through student fees will need to be instituted. Where fees are set at a level that recoups the full direct costs of providing the service at local centres, then these can operate as self-sustaining enterprises without additional subvention from either central or local government. There are a number of options for ensuring that the neediest in society can still avail of OS programmes, including a concessionary fees scheme, payment by instalments and a scholarship fund.

Summary of Recommendations

- 1) Creating a single, national institution to become the sole provider of open schooling programmes is probably not the best way of organising provision for out-of-school learners in Ghana.
- 2) Instead, the Centre for National Distance Learning and Open Schooling (CENDLOS) should work with local partners to provide open schooling programmes throughout the country.
- 3) CENDLOS should be established as a statutory body with semi-autonomous status, linked to both the Ministry of Education and a new Council for Open, Distance & e-Learning (CODEL) with representatives from all key stakeholders.
- 4) In this capacity, CENDLOS can function as the national body for promoting, coordinating and assuring the quality of ODeL programmes at all levels.
- 5) CENDLOS should also act as the national resource agency for:
 - acquiring, adapting and/or developing high-quality ODeL materials that can be delivered in a variety of formats or media;
 - drawing up minimum quality standards and best practice guidelines for ODeL programmes;
 - delivering advice, training and capacity-building for ODeL providers.
- 6) Local partners should be used to deliver open schooling programmes and provide learner support services. The preferred partnership model would require CENDLOS to identify, inspect and recommend accreditation for:
 - at least one Senior High School in each of Ghana's 170 Metropolitan, Municipal and District Assembly areas to act as centres for open schooling programmes;
 - other potential institutional partners, including: technical schools, private and religious-run schools, NGOs & CBOs (particularly for the proposed programme at upper primary level) and the National Prison Service.

Ideally, the fees charged by accredited open schooling centres should cover all the direct costs of providing the service at local level. This would enable rapid expansion of OS programmes throughout the country.
- 7) CENDLOS should support capacity-building for local providers, through:
 - regional orientation workshops for Centre Heads and follow-up visits;
 - a training course for part-time Tutors, offered through ODL methods in conjunction with and accredited by selected Ghanaian universities/polytechnics;
 - other training in specialised areas, such as the use of ICTs in ODeL or designing e-learning resources.
- 8) Existing arrangements at national level for curriculum development, assessment & certification should be exploited, with input from CENDLOS.

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1. BACKGROUND AND INTRODUCTION

Overview

Ghana is a medium-sized country located in West Africa on the Gulf of Guinea. Since the 15th Century, the region has traded directly with merchants from European nations and was a key centre for the transshipment of gold, ivory and slaves. After decades of rivalry between colonising powers, the British established the Gold Coast Crown Colony in the late 19th Century. Following a United Nations sponsored plebiscite, Ghana achieved independence from the United Kingdom in 1957, the first nation in sub-Saharan Africa to do so.

Well-endowed with natural resources, Ghana's main exports include cocoa, timber, hydro-electricity and minerals, such as gold, bauxite, manganese and diamonds. Recent discoveries of commercially-viable oil off the coast in the Western region are set to come on stream in the near future. This development should bring substantial additional revenue for the national exchequer, as well as boosting economic growth and creating a range of employment opportunities. A recent exercise by the Ghana Statistical Service to rebase the country's national accounts to a new reference year (GSS, 2010) has resulted in a 60% increase in estimated GDP. At US\$ 1,318 per capita, Ghana is now classified as a middle-income country in international development indices.

As shown in Figure 1.1, Ghana is divided into ten regions for administrative purposes. In terms of the 2007 Education Reform Programme (see below), responsibility for the maintenance of infrastructure, as well as the supervision and monitoring of all primary, junior and senior high schools has been devolved to metropolitan, municipal and district assemblies (MMDAs). There are a total of 170 such local authorities, comprising 6 Metropolitan and 40 Municipal areas, plus 124 Districts.



FIGURE 1.1 - ADMINISTRATIVE REGIONS OF GHANA

Source: WikiMedia Commons

Ghana's Education System

In 1987, Ghana introduced large-scale reforms to its education system at pre-tertiary level. Among other measures, the curriculum was diversified and a number of community-based day secondary schools were established. As a condition of funding from the World Bank, boarding and feeding subsidies were reduced (and ultimately eliminated) and increased cost recovery through fees was introduced at senior secondary level (Akyeampong, 2008, p. 3).

With a change of Government in 2001, the incoming New Patriotic Party argued that the 1987 reforms had failed to meet public expectations in terms of the education system's coverage, quality, equitableness and economic utility (MoE, 2010, website). The then President, H.E. J.A. Kufour inaugurated a committee to review the process of educational reform under the chairmanship of Prof. J. Anamuah-Mensah, the Vice-Chancellor of the University of Education, Winneba.

The Committee was given a mandate to re-examine the entire education system with a view to making it more responsive to the challenges facing the nation. Special emphasis was given to increasing access at different levels on the educational ladder and to exploiting the potential of distance education and information & communication technologies (ICTs) to

achieve this objective. Ghana's Education Reform Programme was eventually implemented in September 2007. After the National Democratic Congress (NDC) returned to power in 2009, another committee was set up to review and revise the reform programme.

A key element of the 2007 reforms has been the introduction of free and compulsory Universal Basic Education, comprising a total of eleven years up to the end of Junior High School (JHS). However, study at more advanced levels – in Senior High Schools (SHSs), in Technical, Vocational & Agricultural Education and Training (TVAET) centres, and in higher education institutions – is optional and students (or their families) are expected to contribute to the costs of their education through fees. Ghana's education system is summarised in Table 1.1 below:

TABLE 1.1 – Education System in Ghana, 2010

Level	Duration	Intend- ed Ages	Core Subjects	Options for Specialisation	Qualifications
Kindergarten (Pre-Primary)	2	4 & 5		General Education	None
Lower Primary	3	6 – 8	The dominant Ghanaian Language in the area where the schools is located is used as the medium of instruction for: <ul style="list-style-type: none"> • English Language • Basic Mathematical Skills • Natural Science, • Ghanaian Language 	General Education Concepts of Religious and Moral Education, Hygiene, Life Skills, Integrated Science and Citizenship Education integrated with the teaching of subjects at left.	None
Upper Primary	3	9 – 11	English used as the medium of instruction for: <ul style="list-style-type: none"> • Ghanaian Language • English Language • Basic Mathematical Skills • Integrated Science • Citizenship Education 	General Education	No specific qualification
Junior High School (Lower Secondary)	3	12 – 14	<ul style="list-style-type: none"> • English Language • Mathematics • Social Studies • Integrated Science (including Agricultural Science) • Ghanaian Language 	General Education, with the following options: <ul style="list-style-type: none"> • Pre-TVAET • Home Economics • French Language 	BECE (Basic Education Certificate Examination)
Senior High School (Upper Secondary)	4	15 – 19	<ul style="list-style-type: none"> • English • Mathematics • Integrated Science • Social Studies • ICTs (not examined) 	Programmes in the: <ul style="list-style-type: none"> • Sciences • General (Arts) • Visual Arts • Business (Accounting) • Business (Secretarial) • Home Economics • Technical • Vocational • Agricultural 	WASSCE (West African Senior School Certificate Examination)
TVAET	4	15 – 19	Government & Private Technical & Vocational Training Institutions	Wide variety of specialised training programmes	NVTI (National Vocational Training Institute) trade tests COTVET qualifications
Higher Education	4	19+	Universities Polytechnics Professional Institutes Colleges of Education	A variety of academic, technical and professional programmes	Certificates Diplomas Bachelor Degrees Post-Graduate Qualifications

Achieving Equitable Access

In line with the terms of reference for the Committee that devised the 2007 reforms, the Ministry of Education has made expanding access to education a top priority. Significant successes have been recorded at all levels. Between the Academic Years 2001/02 and 2008/09, enrolments in primary schools increased by over 43%, such that almost nine out of ten children between the ages of 6 and 11 years now attend school, compared to six out of ten only seven years previously. At junior secondary level, enrolments increased by over 48% during the same period, though less than six out of ten children in the intended age group are now in school. However, the most dramatic increase has come at senior secondary, where enrolments more than doubled, from roughly 207,000 in AY 2000/01 to over 490,000 in AY 2008/09. Nevertheless, fewer than two out of every ten teenagers in the target age group actually attend Senior High School at present. Although males outnumber females at all levels in the pre-tertiary education system, girls account for nine out of every twenty students (see Table A.1 in *Appendix A*).

While eliminating fees for attendance at primary and junior high schools has undoubtedly had an impact on participation, cost still appears to be a critical factor in determining who receives senior secondary education. Since the costs of boarding are fourteen times higher than day attendance (Akyeampong, 2008, p. 6), students from the poorest households are likely to find this mode of schooling prohibitively expensive, with the result that their choice is limited to day schools within commuting distance of their homes (*Ibid.*, p. 5). The establishment of non-residential senior secondary schools as part of the 1987 reforms contributed to a significant reduction in the cost of education, but only a tenth of institutions at this level are day schools, with obvious consequences for equity. However, the distance that children must travel to attend school does not appear to be a common constraining factor, compared to economic reasons for non-attendance. In a 2003 survey, only 3% of respondents said that the nearest school was too far away when asked to explain why a child was not attending, compared to 50% who gave economic reasons (see *Ibid.*, Table A4.18, p. 17).

When costs become a major factor in deciding who goes to secondary school, children from poor households, particularly girls, are more likely to be affected.

Poverty coupled with customs that undermine girls' education discourages some poor parents from investing in the education of their girl child if they have to make a choice.

(Casely-Hayford, 2002, as cited by Akyeampong, 2008, pp. 7-8)

In addition, there appears to be a relationship between the costs of secondary education and household expenditure on primary schooling in Ghana. When enrolment in SHS is perceived to be beyond the means of parents, they may decide to forego the final years of primary or junior secondary education as well. Akyeampong (2008, p. 8) argues that:

... reducing the costs in secondary education to make it more accessible is likely to have a positive effect on household commitment to primary or basic education. The two should be seen as linked in any meaningful attempt to improve access.

At the other end of the spectrum, however, well-off parents appear to be increasingly willing to pay for perceived quality and choice in education. Between 1998 and 2007, there has been rapid growth in the number of private schools at all levels, but particularly at senior

secondary where almost the entire increase in capacity has come through the private sector (see *Ibid.*, Tables A4.8 & A4.9, p. 8).

ICTs and Education in Ghana

Localised experiments and pilot projects to exploit information and communications technology (ICTs) for educational purposes in Ghana have been taking place for many years, particularly at tertiary level. However, there has been a long gestation period for the development of a national policy in this field. Despite being identified as a key goal in the Ghana Poverty Reduction Strategy Paper, the Education Sector Strategic Plan for 2003-2015 (Ghana; Ministry of Education, Youth and Sports, 2003) and the ICTs for Accelerated Development Policy (Ghana, 2003, pp. 24 & 37-39), a policy document on ICTs in Education was only finalised in November 2008 and published the following January. The policy identifies seven key thematic areas that must be addressed in order to make effective use of the available technologies throughout the education system, including:

- management at all levels of the system;
- building capacity among teachers, administrators and support staff;
- developing the necessary infrastructure for equitable access;
- incorporating ICTs in the curriculum;
- developing or acquiring educational content;
- providing technical support and ensuring sustainable maintenance of installations;
- monitoring and evaluating the system.

However, a study carried out on behalf of InfoDev and the World Bank (Mangesi, 2007, pp. Ghana-8) characterised the state of development in 2007. Although the author recognised the high level of commitment at both presidential and ministerial levels to improving education through the use of ICTs, a number of factors were found to inhibit the widespread use of new technologies for learning, including:

- Access to ICTs in schools is inadequate and uneven, with an urban bias.
- There is a lack of capacity to make use of the available technology, as most teachers do not have adequate skills.
- Collaboration between the Ministry of Education, the Ghana Education Service and other implementation agencies needs to be improved.
- The private sector needs to be engaged as a potential partner in providing the necessary infrastructure.

Since then, a number of initiatives have been undertaken by the MoE and other Government ministries, departments and agencies (MDAs), in cooperation with various partners, to address these shortcomings. Table 1.2 on the following page outlines some of the activities that have been completed since 2007 and that are planned for the immediate future to operationalize the objectives in the *ICT in Education Policy*.



ONE LAPTOP PER CHILD PROJECT IN GHANA

Source: OLPC Website

TABLE 1.2 – Gov’t Initiatives (Actual & Planned) to promote ICTs in Education

Date	Deliverable
November 2008	National Policy on ICTs in Education finalised
End of 2008	Phase I of National Fibre Optic Network finished
March 2009	Assessment Report on e-Readiness of SHSs published
End of 2010	90% of Senior High Schools with computer labs
End of 2010	All Districts have Technical Support Teams
End of 2010	All Regions have <i>ICT Centres for Learning</i> , available to members of the public during afternoons and weekends
Mid-2013	All Senior High Schools will have: <ul style="list-style-type: none"> • Computer Labs • Broadband Internet Connectivity • Teachers trained to utilise technology
2014	All MDAs to be connected to the National Data Centre, with space to accommodate web-based educational resources
To be funded	Ghana Education Network Infrastructure Project

While not all senior high schools are currently able to support web-based delivery of self-instructional materials or online methods of providing learner support, it is expected that most will be within the next three or four years.

History of Distance Education in Ghana

Distance education is not new to Ghana. In the colonial period, many workers and professionals upgraded their qualifications through correspondence courses, though the cost of taking part in such programmes was often prohibitive. This tradition of DE was revived in the 1980s to serve national manpower development needs, including initiatives such as the Modular Teacher Training Programme through which over 7,500 unqualified teachers were able to obtain certificates.

During the early 1990s, the Ministry of Education sponsored a number of surveys to explore the potential for DE in Ghana and assess educational needs. Arising from these, four publicly-funded universities agreed to develop a limited number of courses for delivery through the DE mode. However, because of funding constraints, it was only in 1996 that the University of Education, Winneba (UEW) began offering a Bachelor of Education degree programme through its Institute for Educational Development and Extension. The University of Cape Coast and the University of Ghana followed suite by launching DE programmes in the 2001/02 academic year (Mallet, 2005, pp. 1-2).

Upon assuming power in 2001, the then President of the Republic of Ghana launched a number of initiatives to address areas of concern, including the need to promote alternative approaches to conventional education. Since July 2003, the President’s Special Initiative on Distance Learning (PSI-DL) has engaged in a number of activities, including:

- Video lessons have been commissioned for JHS 1-3 English and Mathematics, as well as for SHS 1-3 English and Mathematics. In total 1040 lessons have been produced, each lasting 26 minutes.

- New sets of video lessons (1280 in total) are currently being produced for SHS 1-3 Integrated Science, Physics, Chemistry and Biology based on the West African Senior School Certificate Examination (WASSCE) syllabus.
- In cooperation with Ghana Television, the video lessons are broadcast on GTV's terrestrial service, which is widely available throughout the country. The current schedule includes four hours of new programming per week (Monday and Wednesdays from 09:00 to 11:00), plus four hours of repeat broadcasts (Tuesdays and Thursdays from 16:00 to 18:00).
- Copies of previously-broadcast video lessons have been dubbed on VCD, compiled into complete sets and distributed to all publicly-funded junior and senior high schools in Ghana, as well as to seven Community Information Centres. These resources are used to supplement existing teaching, to substitute in the absence of a qualified teacher and to enable students to revise these subjects outside of class.
- Seven pilot learning centres have been established around the country in partnership with non-governmental organisations, faith-based bodies and the Ghana National Association of Teachers. Each centre is equipped with a television and DVD player to enable out-of-school learners and those seeking remedial instruction to view the video lessons.
- Printed study guides have also been produced for two TVET courses at post-JHS level – *Catering* and *Block-Laying & Concrete Work*. In cooperation with six public and private TVET institutions, these materials are being piloted with non-traditional learners.
- Support has also been provided for male and female inmates taking part in the education programme of the Ghana Prison Service. Television sets, VCD players and sets of pre-recorded video lessons have been supplied to Nsawam, Kumasi, Ankaful, Wa and Tamale correctional facilities. These centres also take part in an open schooling programme to prepare for examinations at three levels – BECE, WASSCE and NVTI trade tests – so that inmates can acquire basic skills and qualifications that will be vital for their re-integration into society when they are eventually released.

CENDLOS's Mandate

Early in 2010, a decision was taken by Cabinet to transfer responsibility for the promotion of distance education from the Office of the President to the Ministry of Education. Accordingly, the activities previously carried out by the PSI-DL were taken over by a new entity – the Centre for National Distance Learning and Open Schooling – which reports directly to the Minister. While the legal status, configuration and structure of CENDLOS are being determined, the Centre has been mandated to:

- continue providing support for the programmes devised by the PSI-DL;
- draw up an agenda for future open schooling programmes;
- compile an inventory/directory of institutions in Ghana that offer education or training through the DE or ODL mode;
- seek to harmonise and rationalise ODL activities across the education & training systems;
- constitute a think tank to advise institutions and researchers on new developments in ODL;
- organise capacity-building programmes for ODL practitioners;
- foster collaboration between like-minded bodies, both inside and outside Ghana;
- establish models for assuring the quality of ODL programmes in Ghana;

- make recommendations to Government on appropriate ODL technologies in the education and training sectors.

The purpose of this consultancy was to advise and assist CENDLOS in devising strategies for a sustainable open schooling programme and in determining the most appropriate structure for achieving this in the Ghanaian context.

2. NEED FOR OPEN SCHOOLING IN GHANA

Since about 1990 the Commonwealth of Learning (COL) has been promoting the use of a new term – open and distance learning (ODL) – that combines two distinct, but related concepts. *Distance education* (DE) refers to a system of teaching and learning characterised by the separation of the teacher from the learner in time and/or in space. Alternative communication media and technologies are used to bridge that gap. *Open learning*, on the other hand, is a philosophy of education that systematically attempts to remove unnecessary restrictions on who can take part in a learning programme, when and where learning takes place, what is learned and how learners go about it, how the outcomes are assessed, and how credit is accumulated and transferred. These related concepts can be viewed as two intersecting continua or axes, as illustrated at right. Open schooling simply refers to the application of ODL principles and methods to education at pre-tertiary level.

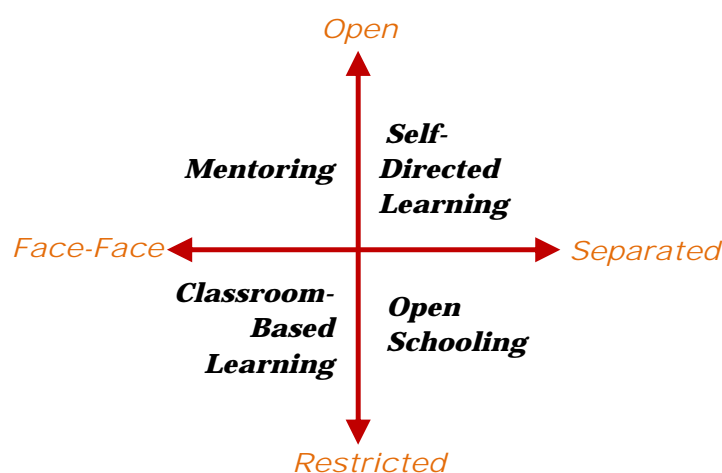


FIGURE 2.1 – A Conceptual Model of Open Schooling

The introduction of ICTs as a tool to support open and distance learning has had the greatest impact at post-secondary level. In response to the success of open universities, an increasing number of conventional higher education institutions have begun to make available on-line resources for conventional students through virtual learning environments, as well as introducing electronic learning management systems. Many also began to offer ODL courses so that, today, nearly all universities aspire to becoming dual-mode institutions.

In some cases, the two modes do not operate as separate tracks but are merged into a single programme available to all students, an arrangement known as *flexible* or *blended learning*. These terms refer to education systems where the teacher and learner are separated from each other for at least part of the process, but come together regularly for conventional contact sessions. In practice, however, almost all ODL programmes include an element of learner support involving periodic, face-to-face interactions with an advisor or academic tutor.

Several authors have attempted to predict where this trend will lead. Tait and Mills argue that the widespread acceptance of DE as a respected mode of delivery has led to a rapid erosion of the distinction between ODL and conventional education. This blurring of delivery modalities calls into question “... the continued existence of the distance-education tradition (1999, p. 2)”. Ultimately, they envisage a convergence of institutional models to the point where all universities will become blended-mode institutions in future.

At secondary level, there has also been a move towards blended-mode tuition in many countries around the world. However, no one is suggesting that conventional secondary or high schools be eliminated. Instead, open schooling is promoted as a means of addressing

the needs of a growing number of young people (a ‘tidal wave’ according to Sir John Daniel) progressing through schools in many developing countries as the result of the introduction of free universal primary education. Rather than continuing to expand the secondary education system by building and staffing more conventional institutions, open schooling offers an alternative approach for:

- ensuring **equitable access**,
- **reducing the costs** of education,
- delivering **high quality** learning opportunities, and
- improving the **education system as a whole**.

Target Groups

Open schooling programmes typically target marginalised groups who do not have the same access to education as their peers, including:

Girls and young women

In many parts of the world, female participation in basic and secondary education lags behind that by males for a variety of reasons, including economic factors, socio-cultural norms and religious beliefs. Although this may have been the case historically in Ghana, in recent years enrolment rates for girls have come close to matching those for boys at both primary and junior secondary levels, while girls are now more likely than boys to complete all six years of primary school (see Table A.2 in *Appendix A*). At senior secondary level, however, the picture is more mixed; it appears as if a greater percentage of young women in the intended age group are admitted to SHS1, but fewer of them persist for the full four-year cycle.

A problem that particularly affects girls studying at this level is the possibility of becoming pregnant. Even if they wish to continue their education after giving birth, this may be discouraged or prohibited by school authorities. In some parts of the world, specialised open schooling programmes have been devised to accommodate the needs of teenage mothers by introducing flexible attendance requirements, providing child-care while young women are in class, and offering advice on issues such as health and nutrition for mothers and their infants.

Children withdrawn from school to work

Even where attendance at primary school is compulsory, children may be held back from school in order to carry out work that is vital to the household economy. For example, the practice of employing boys as young as five or six years of age to herd cattle and other livestock is well-established in Lesotho, with the result that a significant number reach adulthood without ever attending school. Girls are often required at home to nurse ailing relatives or to carry out household chores, and may miss a considerable number of school days. Although no data was found on this phenomenon in Ghana, 11.5% of children between 6 and 11 years of age were not enrolled in primary school, while 52.2% of children between 12 and 14 years of age did not attend junior high school during the 2008/09 academic year (see Tables A.2 and A.2a in *Appendix A*). In total, this means that over one million Ghanaian children are not enrolled in basic education, despite the fact that it is now free and compulsory.

Young people who did not pass their examinations

As indicated in Table A.3, roughly 188,000 young people did not enter for or did not pass at least one of the core subjects in the June 2008 sitting of the Basic Education Certificate Examination (BECE). In addition, at least 77,000 students who had prepared to sit the West African Senior [Secondary] School Certificate Examination (WASSCE) in 2008 were not successful in one or more core subjects. In most cases, schools do not have sufficient places to allow these students to repeat the final year of the course so that they can attempt the

examination again the following year. As a result, such young people may leave school without any qualification to show for three or four years of study.

Re-sit candidates for the BECE and WASSCE differ from other out-of-school youths because they have generally had some success within the education system, as evidenced by the fact that they have continued to the end of the relevant cycle. Their motivation for further learning is also likely to be high, particularly if they are repeating only a few subjects in order to obtain satisfactory marks for the full award. For these reasons, re-sit candidates can account for a substantial proportion of those who register for studies with open schools, private tutors or for-profit education institutions. Ideally, a separate learning programme should be devised for this group, as is the case with the National Open School of Trinidad & Tobago. Typically, such programmes focus on revising key topics, rehearsing with past papers and improving examination techniques. Time is also limited, as members of this target group plan to re-sit the exam at the first available opportunity.

Young people who did not meet the entry requirements for SHS, TVEAT or Higher Education

In addition to students who did not enter for an examination or those who failed one or more subjects, there is another group who passed but did not achieve the required standard for promotion to the next highest level in the education system, either from JHS3 to SHS1/TVEAT or from SHS4 to higher education. In most cases, senior secondary schools, TVEAT centres and higher education institutions set minimum entry requirements for their courses, though final selection is often limited by the number of places available rather than the academic abilities of candidates.

While some young people may seek to re-sit examinations at BECE level in the hope of improving their results and qualifying for admission to SHS1, the existence of an open schooling programme to prepare candidates for WASSCE would offer a complementary pathway for progression. Students who complete their BECE with an open school or who do not achieve the standard required for further institution-based studies would still be able to climb the educational ladder outside the conventional system. Likewise, those seeking to enter an institution of higher education can prepare to re-sit the required subjects in the WASSCE in order to achieve the required standard or continue their studies at tertiary level through an ODL programme.

Youths whose families cannot afford to pay school fees

As noted in Section 1 of this report, cost is a major factor in determining who takes part in senior secondary education in Ghana. Even where a young person's family can afford to pay fees and live close enough to a SHS to enable attendance as a day student, there are a number of hidden costs involved. Akyeampong's analysis of expenditure for a student at senior secondary school in the 2001/02 academic year (2008, Table A4.6, p. 7) indicate a variety of charges for entertainment, examinations and stationery, as well as annual dues for the use of library, resource centre and science facilities. The cost of the uniform for a first-year student in SHS can exceed the combined total of other charges, while the expenditure on transport to and from school is not included in the analysis.

Data from the 2000 *Household Income and Expenditure Survey* suggest that the cost for one child to attend a day SHS exceeded the annual per capita expenditure in the lowest 20% of Ghanaian households, while only the top 20% had sufficient disposable income to cover their children's attendance at a government boarding school (*Ibid.*, Tables A4.6 & A4.7 on p. 7). Even if sufficient places were available in government day SHSs, it is likely that many of the 669,000 out-of-school youths between 15 and 17 years of age could not afford to attend.

Early school leavers

Any young person who leaves school before the statutorily-prescribed age or who withdraws from an educational programme before its scheduled conclusion can be classified as an early school leaver or “drop-out”. Typically, members of this group have not done well in the formal education system for a variety of reasons – specific learning difficulties, lack of interest, pedagogical approaches that did not suit their preferred learning styles, or rebelliousness/resistance to the rules imposed by schools. In many cases, early school leavers have bought into a counter-culture that prescribes different norms and seeks success through alternative economic activities, such as music-making or criminality. While their motivation to learn may be very high within special areas of interests, many drop-outs show little interest in what schools have to offer. For this reason, it can be difficult to devise open schooling programmes to re-engage members of this target group and to entice them to return to formal education. Nevertheless, out of economic necessity many drop-outs seek to acquire basic skills so that they can earn a livelihood, and short courses with a vocational orientation are often successful in meeting their immediate needs.

Adults who never had a chance to attend or complete school

While the 2007 educational reforms introduced free and compulsory basic education, the vast majority of adults never had this opportunity and left the education system without completing either primary or secondary education. Data from the 2000 Census revealed that over 5 million Ghanaians (46.7% of the population fifteen years of age or older) were not literate in any language (Ghana Statistical Service, 2002a). Although the National Functional Literacy Programme has been in operation since the 1980s, because of funding constraints it currently provides classes for only about 60,000 adults every two years. Many of these new literates are likely to want to further their education, but there is no adult upper primary equivalency programme available for them to pursue.

In addition to the above, there are an unknown number of adults who have completed primary school but did not attend junior secondary. While many of these would see no reason to return to education, for a significant proportion of them the lack of a secondary qualification limits their employment prospects or bars their way to advancement. Other factors that can motivate adults to return to education include the desire to help children with homework, personal interest in particular subjects, the intrinsic satisfaction of learning and public recognition for academic achievements.

Those who return to education after several years outside the system often require a different approach from that used for re-sit candidates or young people who recently left school. The National Open School of Trinidad & Tobago offers a separate programme for this target group, which develops their understanding from basic principles, relates these to their life experiences, boosts their confidence and enables them to prepare for the school-leaving examination over a two-year period. In many cases, too, adults seek to acquire knowledge and skills that can be immediately applied in their place of work. Such competency-based technical and vocational programmes are of particular importance where employers are supporting participation by employees, either by making a contribution towards costs or allowing them time off for study.

Young People already in School

Those attending conventional schools can also benefit from the resources produced for OS programmes, as discussed in greater detail in Section 5 of this report. Self-instructional materials can help make up for the absence of a qualified teacher or for inadequate teaching. In addition, learners who seek additional help with a particular subject in order to improve their chances in the examination can avail of the tutorials and other resources that open schools have to offer.

3. ORGANISING THE PROVISION OF OPEN SCHOOLING PROGRAMMES

Although open schooling programmes are provided in a wide variety of ways in different jurisdictions within the Commonwealth of Nations, it is possible to identify certain common elements.

Systems Model of Open Schooling

In a 1986 paper, Rumble (pp. 15-17) proposed a simple model which looks at the operations of ODL institutions in terms of a number of inter-related sub-systems. The value of such a model is that it clearly identifies the main areas of activity in an ODL institution and defines the relationships between them. It also suggests an analogy between a factory producing items for consumption and the 'quasi-industrial processes' of an ODL institution. Just as in a factory, ODL involves the specialisation of tasks and the division of labour between different units.

While Rumble's model reflects the operations of the UK Open University where he worked, it requires some modification in order to represent all phases of open schooling. In most open universities, internal processes are used for curriculum development and for assessment & certification, though external advisors/examiners are often involved in order to assure quality. However, at pre-tertiary level, developing and promulgating the curricula and syllabi for different phases of the formal education system is normally the responsibility of a separate body or a specialised unit within the Ministry of Education. Likewise, responsibility for administering standardised examinations and awarding certificates to successful candidates is usually devolved to a national examinations authority, often in cooperation with a regional or international body. Thus, it is necessary to separate these processes when representing the operations of an open school. The main areas of activity in the systems model for open schooling are:

Curriculum Sub-System

Before study materials can be prepared, it is essential to have in place an agreed set of principles and objectives for each subject, as well as lists of the themes and topics that learners are expected to master. There are many different approaches to curriculum development, but all involve processes of needs assessment, design, consultation and dissemination.

Materials Sub-System

The next sub-system includes all activities involved in the acquisition and/or development of self-instructional materials, whether these are primarily paper-based or involve other media. These resources also need to be reproduced and prepared for distribution in a form that can be easily accessed and used by OS students.

Learner Support Sub-System

Once learning materials have been developed, reproduced and are ready for distribution, the open school needs to recruit learners. This sub-system comprises all of the activities, staff and other resources that are involved in registering students, facilitating their learning and managing their progress through a programme.

Certification Sub-System

Although providing learners with feedback on their progress in meeting the objectives prescribed for a particular course is part of the learner support process, a separate sub-

system is involved in the formal assessment of each learner's performance and in awarding certificates to recognise their achievements.

Logistical Sub-System

The Materials and Learner Support Sub-systems are supported by other units which procure and manage resources for the institution. Those units, which look after finances, human resources and information and communications technology (ICT), comprise the Logistical Sub-System of any open school, college or university.

Regulatory Sub-System

Finally, overall management and guidance is the responsibility of the Regulatory Sub-System, which is sometimes referred to as the 'Brains' of the institution. All activities related to strategic planning, policy formulation and monitoring the institution's performance in meeting its goals are part of this sub-system.

Unlike a conventional school or college, an ODL institution devotes a large part of its resources (staff time and office facilities, as well as funds) to its Materials Sub-System and much of its expenditure on materials development is incurred before any students enrol. In this respect, an open school performs many of the same functions as an educational publishing company. However, unlike textbook publishers, open schools also include a Learner Support Sub-System which assists students throughout the learning process.

The modified Systems Model is illustrated in Figure 3.1 on the following page, and recommendations for addressing the processes in each sub-system are discussed in the following sections of this report.

Exploiting the Value Chain for Open & Distance Learning

In recent years, it has become more common to consider the provision of ODL services in light of the 'value chain' model popularised by Michael Porter in his 1985 book, *Competitive Advantage*. The value chain is a conceptual framework for improving the management of any enterprise or project. Essentially, this construct provides a model for analysing all of the distinct activities in the production of goods or services that add to their value. A critical feature of the model is that the value of the final product is greater than the sum of the values added through each step in its production.

Processes are categorised as either 'primary' – such as operations, logistics, marketing and sales – or 'support activities' – such as administration of the firm's infrastructure, HR management and procurement. The ultimate goal of such an analysis is to increase the creation of value in the production process while minimising costs. The range of primary and support processes varies depending upon the type of activity a company or institution is engaged in and what it produces. When applied to ODL, the value chain for delivering a course or programme would include all of the components in the systems model discussed above.

Traditionally, open schools attempted to carry out everything involved in delivering a programme using their own staff and facilities, but it is usually more cost-effective to disaggregate the primary activities in the value chain. For example, in many instances it makes more sense to outsource the printing of study guides rather than setting up an internal print shop. Likewise, there is little justification for building new tutorial centres for OS learners if existing public facilities, such as schools or community centres, can accommodate them after normal hours. Thus, most open schools make use of a patchwork of arrangements with other bodies in order to deliver their programmes.

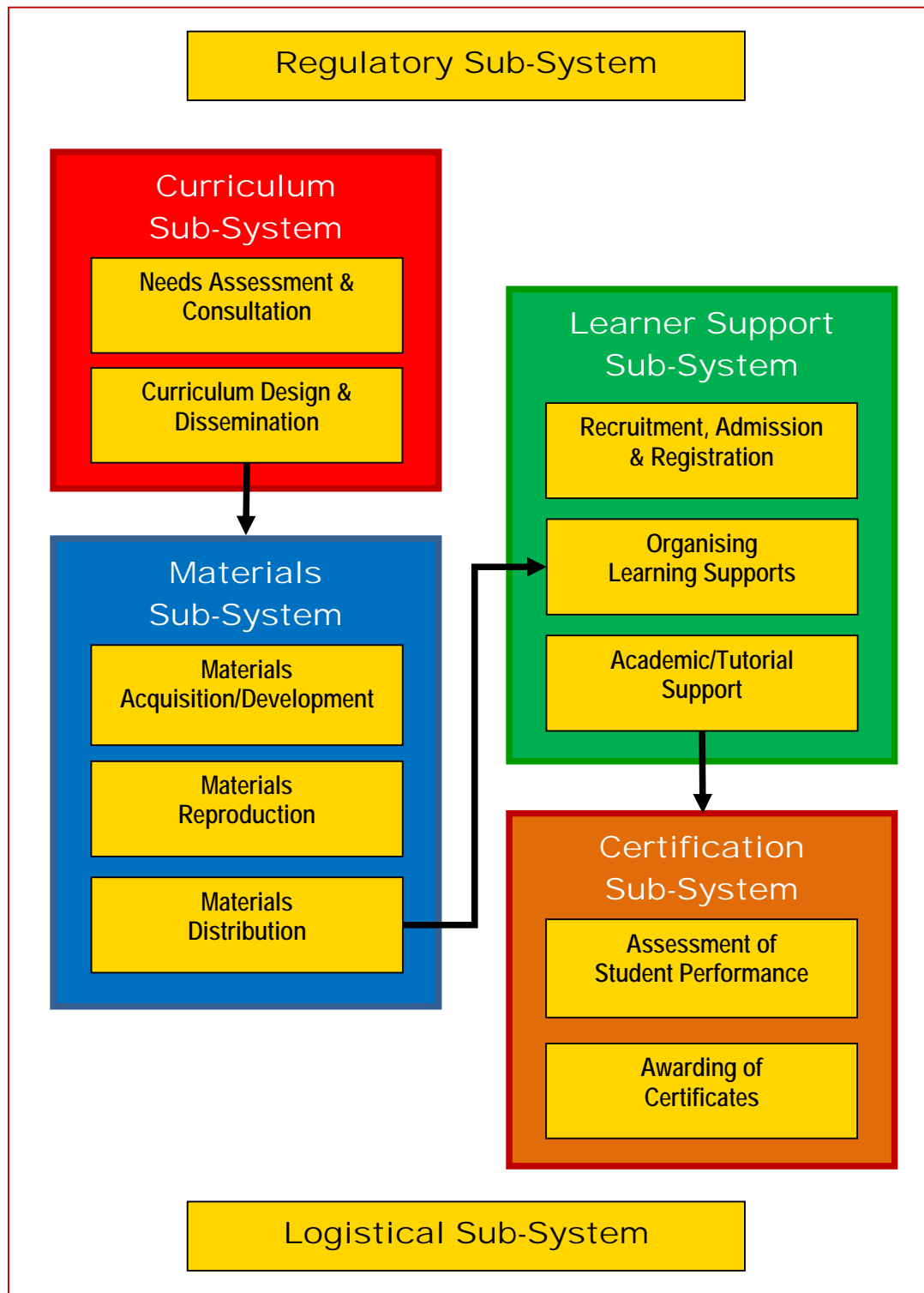


FIGURE 3.1 – Systems Model of Open Schooling

Adapted from Rumble (1986)

4. REGULATORY & LOGISTICAL SUB-SYSTEMS

As noted in the first section of this report, the future status and role of CENDLOS is currently under discussion. Until such time as its direction and the scope of its activities have been decided, it is impossible to recommend a structure for regulating the Centre's activities and meeting its logistical requirements. For example, if CENDLOS was to become the sole provider of government-sponsored OS programmes in Ghana, it will need to create a network or regional offices to manage activities on the ground, as well as setting up substantial financial management, human resources, record-keeping and other units to support its operations. On the other hand, if CENDLOS becomes a resource and development agency, as suggested in Section 9, no offices may be needed outside of Accra and minimal logistical support will be required.

Nevertheless, both of these options are likely to require statutory provisions, and the preparation and approval of legislation or para-legal instruments is inevitably a lengthy and involved process. In the short- to medium-term it is desirable that CENDLOS Management have access to a wider body of stakeholders that can provide advice, guidance and oversight while the Centre adapts to its new roles and responsibilities.

Interim Development Board

A device that was particularly useful during the establishment of the Namibian College of Open Learning was an Interim Development Board. This body was appointed by the Minister of Basic Education to advise him on the drafting of legislation and to plan appropriate internal policies, procedures and structures in anticipation of NAMCOL's being granted semi-autonomous status by an Act of the Namibian Parliament. A similar structure could provide useful support for the development of CENDLOS and consideration should be given to setting up such a body as soon as possible.

5. CURRICULUM SUB-SYSTEM

There is no universally accepted approach to determining the curriculum and syllabus for open schools around the world. Instead, each institution adopts a particular model or models to meet the needs of its target groups.

Types of Open Schooling Programmes

Daniel (2010, pp. 69-74) identifies three broad types of open schooling programmes:

Complementary – This approach ensures that what is offered by the open school follows exactly the same curricula and is assessed in exactly the same way as in conventional schools. The only difference between the two systems is that greater use is made of self-instructional materials or alternative technologies when delivering the open schooling programme.

Alternative – In places where the curricula used in schools is primarily oriented towards further studies at tertiary level, open schools can provide for the needs of children and adults who seek a programme that focuses on work-related content and skills that are immediately applicable in the real world. Alternative open schooling programmes typically make use of new curricula and competency-based assessment methods, as well as different modes of delivery.

Integrative – Instead of operating on the fringes of the conventional education system, open schooling programmes can be interwoven with existing provision. In this way, an open school can extend the reach of traditional education, while acting as a catalyst for innovation and improving quality. Whether or not those studying in conventional schools can avail of open schooling opportunities is largely dependent upon government policies at national, provincial or local level (Du Vivier & Ellis, 2009, p. 32). However, if governments and local providers can be persuaded to integrate open schooling programmes with their conventional classroom offerings, there is tremendous potential for synergies. As the case of the Vancouver Learning Network has shown, such an integrative model of open schooling can:

- provide students with greater choice, by enabling them to study subjects which cannot be offered in every school because of limited numbers or the lack of qualified teachers;
- resolve timetabling conflicts;
- compensate for inadequate teaching or for the prolonged absence of a teacher as a result of illness or other causes;
- improve the quality of learning resources available to all students;
- motivate teachers to make more effective use of available e-learning technologies.

The activities initiated by the PSI-DL that have been taken over by CENDLOS suggest both a complementary and an integrative approach to open schooling. The broadcasting of video lessons and the supply of these on VCDs/DVDs to schools is an attempt to provide additional resources for the conventional education system to compensate for the lack of qualified teachers or to supplement existing teaching. Since these video lessons follow the same curricula and syllabi as used in the classroom, they enable those outside of conventional schools to pursue a complementary programme of studies that will prepare them for the same examinations as their school-based counterparts. Such an approach has been shown to facilitate articulation between the in-school and out-of-school education systems and to foster public acceptance of the qualifications earned through studies at open schools (Mayumbelo *et al.*, 2008). However, as discussed in Section 2 of this report, an alternative

curriculum may be more appropriate for early school leavers and newly-literate adults or those who have not attended school for many years.

Existing Mechanisms for Curriculum Development

In Ghana, as in many countries around the world, separate bodies are involved in devising and disseminating curricula for formal education and for technical & vocational education and training.

Formal Education System

The Curriculum Research & Development Division (CRDD) of the Ministry of Education is responsible for these functions in respect of school-level programmes throughout the country. Up till 2007, schools offered roughly sixty different subjects, though the curricula and syllabi for many of these had not been revised for years because of manpower and funding constraints. Since that time, however, the CRDD has put in place plans for regular review and revision, as well as for the development of curricula in new subjects to meet the current and future needs of Ghanaian society.

Extensive consultations are made with a variety of stakeholders before any new programme is finalised for dissemination. Typically, the syllabus prescribed for teaching covers a wider range of topics and themes than are examined, but CRDD liaises closely with the West African Examinations Council to ensure that the curricula and syllabi used in Ghanaian schools conform to standards for the region. The CRDD is also involved in the development of teacher's guides and other learning materials for use in schools when new syllabi are being introduced.

The MoE also aims to ensure that the education provided in schools is relevant to the world of work, to development in rural areas and to modernisation of the agriculture-based economy that still predominates in many part of the country. For this reason, preparatory courses in Technical, Vocational & Agricultural Education and Training (TVAET) have been introduced as electives in JHSs. Those studying at SHS level can also opt for Technical, Vocational or Agricultural programmes where these are offered in their schools. Although a separate Council has been established to regulate the TVET sector (see below), the curricula and syllabi used by schools for these subjects are devised by the MoE's CRDD. Given the importance of these disciplines for Ghana's economic and social development, it is essential that these subjects be offered as part of a national open schooling programme.

Technical & Vocational Education and Training

The traditional system of TVET in Ghana has evolved over many years in an uncoordinated fashion, primarily through the efforts of a range of providers who typically devised training programmes without reference to similar initiatives in other parts of the country. In general, the quality of teaching and learning material was unsatisfactory, preparation of trainers was inadequate and there was a general lack of instructional material (COTVET, 2010, p. 1). As a result, TVET suffered from a poor public image which made it more difficult to recruit trainees and staff, as well as to secure funding for training equipment and facilities.

In 2006, the Ghanaian Government promulgated the Council for Technical & Vocational Education Training (COTVET) Act [No. 718 of 2006] in order to coordinate, harmonise and improve the quality of the programmes offered by different providers. Four standing committees of COTVET have been inaugurated, including the Industrial Training Advisory Committee, which generates and validates standards for training and workplace placements in different sectors. In consultation with the Training Quality Assurance Committee and the National Technical & Vocational Education and Training Committee, these standards are used to develop curricula and syllabi for different programmes.

Post-Literacy and Adult Non-Formal Education

As noted in Section 2 of this report, the Ministry of Education established a special unit – the Non-Formal Education Division (NFED) – to address the needs of the very large number of non-literate adults in Ghana. At present, there are no options available for those who complete the adult literacy programme and wish to further their education. Although it might be possible to adopt the curriculum developed by the CRDD for the senior cycle of primary school, it is usually better to develop a separate curriculum and syllabus to reflect the interests and life experiences of adult learners.

If CENDLOS decides to develop open schooling programmes to address the needs of this target group, it should work in partnership with NFED to devise a relevant curriculum and syllabi, as well as in developing appropriate self-instructional materials. Models for such a programme can be obtained from the UNISA ABET Institute or the National Literacy Programme in Namibia, among other providers.

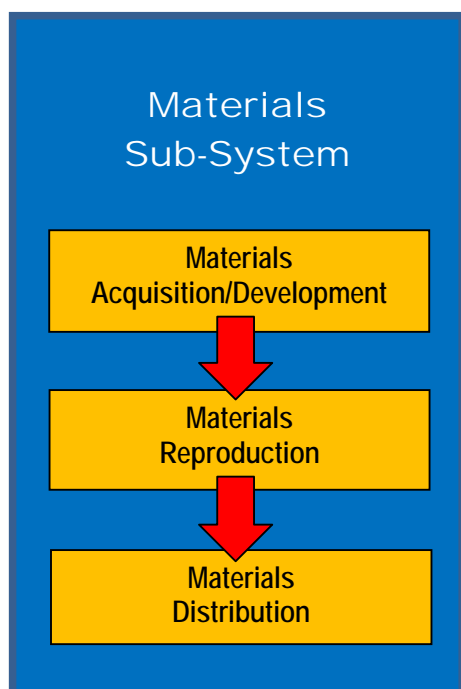
The Role of CENDLOS in Curriculum & Syllabus Development

The curriculum review and development cycle can impact negatively on open schools in several ways. Where a considerable investment of time and money has been made in the development and production of new ODL resources for a particular course, these can be rendered worthless by the introduction of changes to the curriculum or syllabus. Problems can also arise when the unit responsible for curriculum development proposes conditions for continuous assessment (e.g. on-site demonstrations of vocational skills) that open schools might not be able to meet.

For these reasons, it is desirable for a national open schooling agency, such as CENDLOS, to be involved in all curriculum review and development processes, in order:

- to represent the interests of OS providers;
- to ensure that proposed changes to curricula or syllabi can be adapted for delivery through ODL methods; and
- to facilitate coordination and forward planning for the development of cost-effective self-instructional materials.

6. MATERIALS SUB-SYSTEM



The starting point for any open schooling programme is high-quality, self-instructional materials. These differ from traditional textbooks by including a number of features to increase the level of interaction between the student and the course content. Good OS materials typically have clearly-stated objectives to make explicit what is required of students, in-text questions to encourage them to relate what they are reading to their own experience, self-mark quizzes to test their understanding of concepts and principles, and end-of-unit activities to review and consolidate the learning that has taken place.

Research has shown that improving the interactivity of materials has the most significant impact on student outcomes in distance education programmes, when compared with increased student-student and teacher-student contact (Bernard *et al.* 2004, 2009). Accordingly, investing in interactive learning materials is likely to yield better results than providing additional face-to-face tutorials or peer-to-peer study groups.

The Importance of Scale

Ideally, the Materials Sub-System should be the responsibility of a centralised unit, such as CENDLOS. This is because decentralising the process of materials development is likely to lead to duplication of effort. Consider the way in which e-learning is being adopted by most conventional schools and universities. Typically teachers or lecturers work on their own, in isolation from their peers, to:

- decide what elements to include when designing instruction,
- find existing learning resources and activities or devise new ones,
- prepare their own lecture notes and/or slides,
- select and download assigned readings,
- facilitate online discussion forums or other virtual activities,
- set assignments or other tasks for assessing student progress,
- test student performance.

Daniel (2010, pp. 45-64) critiques this approach because it can never achieve economies of scale. It approximates the cottage industry model of production that was widespread in Great Britain before the Industrial Revolution. He argues that the application of technology opens up the possibility of treating education in a manner analogous to industrial production (*Ibid.*, p. 52), which is characterised by a division of labour. Thus, in order to be cost-efficient, ODL institutions need to employ specialised staff for:

- instructional design,
- authoring study materials,
- designing resources for publication on paper or in other formats,
- reproducing materials,
- distributing materials.

By adopting a factory model, ODL institutions are able to achieve economies of scale by producing a unified product that can be used over several years by a large number of

students. Because people with the special skills required to produce quality study materials tend to be in short supply in most countries, it is essential to build up a critical mass of such staff in a centralised unit or agency.

Materials Acquisition/Development

The cost structure of open schools differs from that of conventional education institutions in that a considerable amount must be invested in acquiring or developing self-instructional resources before any students can be enrolled. Developing OS materials from scratch can also be time-consuming; typically it takes eighteen to thirty-six months from planning to delivery of new study guides or online resources. Clearly, then, significant savings of time, expenditure or both will be made if existing materials can be acquired at little or no cost to the institution. For this reason, every effort should be made to identify existing resources that are suitable for use in the Ghanaian context, either as is or with some adaptation.

Existing Textbooks

One approach to the provision of self-instructional materials is to develop “wrap-around” study guides, workbooks or other resources that are used in conjunction with textbooks that have already been approved for local schools. In this case, the textbook is the main vehicle for transmitting information or subject content, while the supplementary material provides advice for the student on how to make best use of the textbook and includes the interactive elements discussed above. Typically, the “wrap-around” gives a brief introduction to a topic, then directs students to read a section of text, after which they can engage in various exercises to review and practice what they have learnt. These supplementary materials can take a variety of forms, including printed booklets, audio, video or computer-based resources. The “wrap-around” approach usually involves lower costs and shortens the lead time for the introduction of new OS materials, since only a limited amount of original content needs to be developed.

Open Educational Resources

The term “Open Educational Resources” (OERs) was coined by UNESCO in 2002 and refers to digitised materials that may be used and/or adapted for teaching and/or learning without payment of royalties or licensing fees. Notwithstanding the principle that such resources should be available free to users, institutions may charge a reasonable amount to recoup the costs of reproducing and distributing OERs in paper or other off-line formats. There is a wealth of OERs available on the World Wide Web, though finding those of relevance to a particular curriculum and syllabus can be a laborious process.

As part of a multi-national project supported by the Commonwealth of Learning and the William and Flora Hewlett Foundation, open schooling bodies in Zambia, Lesotho, Namibia, Botswana, the Seychelles and Trinidad & Tobago have developed generic materials in a number of subjects at junior and senior secondary level. These can be adapted for use in Ghana, if required. In addition, there are several repositories where OERs can be found and used as the basis for self-instructional materials by students preparing for the BECE or WASSCE.

The OERs created during the COL project follow best practice guidelines for ODL materials and include a number of features to promote student engagement with the content. As is, they are perfectly adequate for use (either online, offline or as printed pdf documents) for any OS programme, but there is scope for enhancing them with multi-media and interactive computer-based resources. At least some of the OERs have been designed as lesson summaries that wrap-around existing textbooks and must be used in conjunction with them. While the OERs are available online free of charge, some arrangement will still need to be made to cover the cost of providing textbooks.

Teacher-Generated Content

A variety of learning resources have been created by teachers and published on the Internet, some as OERs and others with different copyright arrangements. Many teachers are happy to share the materials they generate in the course of their work, as long as others do not profit from their intellectual efforts. Initially this was the preserve of tech-savvy innovators and early adopters, but as the tools for creating web-based content have become more user-friendly and the pressure from students and peers has grown, more and more teachers are trying their hand at it. Storing teaching notes, exercises, quizzes and other materials on a school website or elsewhere on the Internet can also be a handy way for teachers to manage these resources. However, much of the content generated for the web simply reproduces traditional pedagogical practices in a different medium, without exploiting the potential of ICTs to support new methods and modes of teaching and learning (NSSE, 2009, pp. 19-20).

Recently, some websites have sprung up that combine the features of a Virtual Learning Environment (VLE) with social networking tools that facilitate increased communication and interaction between students in different countries. These initiatives seek to capitalise on the goodwill of teachers by providing them with a facility for safeguarding the digital content they have created by uploading it to a website on the Cloud, improving it by adding illustrations, video clips or other media, then publishing it if they wish.

For example, the NotesMaster initiative (www.notesmaster.com) aims to gather e-learning resources from teachers around the Caribbean so that students from schools in nineteen different countries and territories can benefit. The structure of the NotesMaster site parallels that of the curricula used across the Caribbean, which helps teachers label and file the content they generate so that it can be more easily utilised by students. It can be argued that this portal empowers teachers in the Caribbean by enabling them to become creators rather than mere consumers of digital resources, thereby contributing to a counter-flow against the vast volumes of information flooding the Web from industrialised countries of the North (Dunn, 2008, pp. 3-6, 11-12).

However, the resources created by teachers and posted on such sites, on their own, may not be adequate for an open schooling programme for at least three reasons:

- **Comprehensiveness** – It is likely that teachers will upload lesson summaries and notes that are aimed at revising what is covered in the classroom, but which do not cover the course content in the systematic, comprehensive and step-by-step fashion that many OS students require.
- **Coverage** – Since it is entirely voluntary for teachers to contribute their intellectual product to such sites, there is no guarantee that content will be available for all subjects or for all topics in the subject syllabi.
- **Quality** – Questions have also been raised about how the quality of teacher-generated content can be assured. In the absence of any mechanism for checking the accuracy and currency of the information uploaded to a website, misinformation can easily be spread.

Proprietary e-Learning Resources

Several companies in the IT sector have initiated projects to provide e-learning resources for primary or secondary students as part of their social responsibility obligations. These differ from OERs in that they are subject to normal copyright restrictions, with all rights reserved by the project or the company that backs it. For example, Intel Corporation has extended its *Skooool* initiative by creating a site – www.skooool.com.gh – where Ghanaian students can access e-learning resources for JHS and SHS mathematics and sciences free of charge. Although such sites can appear impressive because of high-quality graphics and interactive

elements, they may nevertheless be relatively primitive in terms of their instructional design features.

Materials Delivery & the Role of ICTs

Daniel (1996, p. 102) argues that the media used in the production, reproduction and dissemination of information shapes our beliefs about what constitutes knowledge, how it is used, the cultural practices associated with it and even modes of thought (Prensky, 2001b). Most adults who work in the field of education were raised in a belief system based on print-based knowledge, while many young people (at least in industrialised countries of the global North) derive their information primarily from the web and globalised hyper-media. Such a difference creates the potential for conflict between students who are digital natives and teachers who are still learning to operate in this new and unfamiliar environment (Prensky, 2001a).

There is little evidence to indicate that the use of ICTs and e-learning resources, on their own, has anything more than a marginal impact on student performance in subjects apart from mathematics (Shapely *et al.*, 2009). For example, a meta-analysis of ninety-six research reports (Sitzmann *et al.*, 2006) found that, when the same instructional methods are used, computer-based instruction is no more effective than conventional classroom techniques. Where positive effects have been found, this may be the result of changes in what takes place in computerised classrooms, where students spend more time on task and teachers can give more individual attention (Waxman *et al.*, 2003). In general, technology-enhanced learning (TEL) has the following advantages:

- Technology can provide immediate feedback for repetitive, mechanical activities (e.g. multiple-choice tests or problem sets in mathematics).
- ICTs can deliver the same message through multiple media to facilitate students with different learning styles or those with disabilities.
- TEL can enrich the learning experience by giving access to a wider range of learning resources.
- ICTs can facilitate peer-to-peer interaction and project work, consistent with Social Constructivist learning theories.

Although the use of new technologies has a certain 'wow' factor, this quickly fades as students become familiar with these learning tools and begin to treat them as just one more addition to the classroom.

As noted in Section 1 of this report, the Government of the Republic of Ghana, in cooperation with a variety of partners, is investing heavily to upgrade information and communications technologies in schools and tertiary institutions, though there are still significant gaps and shortcomings. Nevertheless, it will take a concerted effort over a number of years to ensure effective access. In order to make e-learning effective in schools, local area networks must be installed and maintained, sufficient bandwidth must be available to access online resources reliably at reasonable speeds, teachers must be trained in how to make best use of the potential of new technologies and interaction between users needs to reach a critical mass (Dunn, 2008, pp. 11-12).

The practice of distance education has evolved through a series of generations as new technologies and media have been applied to the field, from the earliest correspondence courses that relied exclusively on paper materials and national postal systems, to what has been called the Flexible, Intelligent Learning Model that exploits the interactivity of Web 2.0 tools (Taylor, 2002; as cited in Sharma & Juwah, 2006, pp. 230-232).

TABLE 6.1 – Generations in the Evolution of ODL Systems

Dates	Model	Technologies
Late 1700s	Correspondence Courses	Print on paper National postal service
1920s	Tele-Learning Approach	Radio and subsequently Television
1970s	Computer-Based Learning	Interactive computer programs
2000s	Flexible, Intelligent Learning Approach	Learning Mgm't Systems/Virtual Learning Environments Web 2.0 tools Social Media for increased interactivity between: <ul style="list-style-type: none"> • students and teacher, and • students and their peers.

Deciding on the most appropriate technology or technologies to use for delivering a course to a particular group of learners requires a detailed assessment of several different factors, including:

- Are there significant differences in the **cost of reproducing materials** in different media?
- What are the **costs and constraints** associated with **distributing study materials** in different forms?
- How **flexible and convenient** is the technology to use (e.g. does it require an uninterrupted supply of electricity)?
- How **reliable** is the technology? Can it be maintained and repaired locally?
- Are there any **security** issues associated with the distribution of materials in a particular media (e.g. computer viruses or the theft of equipment)?
- Do particular media facilitate **accessibility** for those with physical impairments?
- Does the medium enhance the **quality of the learning experience** for students?
- Are there **other benefits** that arise from the use of a particular technology (e.g. the acquisition of basic computer skills when resources are available online)?

Ultimately, a decision on the most appropriate technology to adopt for delivering a course or programme will depend upon the characteristics of the target group, the prevailing circumstances in the areas where they live and the relative weight given to each of the above factors.

Television Broadcasts

Televised study materials have been used extensively in open schooling programmes over many years, as demonstrated by the success of Telescondaria system in Mexico (see Daniel, 2010, pp. 113-116). Over a period of six years, the President's Special Initiative for Distance Learning pioneered the use of broadcast video lessons as a means of providing additional learning resources for students both in and out of school in Ghana. An appraisal of these materials, along with suggestions for improving them, can be found in *Appendix D* of this report.

While this medium allows educational content to be distributed to a large number of learners at very low cost, it is subject to a number of limitations. Potential viewers may not be able to avail of television broadcasts for a variety of reasons:

- They may not have access to a television set at the time when the broadcast takes place.

- They might be engaged in other activities or be called away during the broadcast.
- The power supply in their area may be interrupted.
- They may forget to tune in at the right time.

Because of these limitations, television broadcasts should not be used as the main mode for the delivery of learning content for Ghana's open schooling programme. Nevertheless, it is desirable that these broadcasts continue, pending a more comprehensive evaluation of their viewership and effectiveness. Copies of the video lessons should also be made available for asynchronous use, as is the case at present.

Online Resources

One option for delivering study materials for OS students in Ghana is to make them available online, as this would enable learners to access the resources from any Internet-linked computer or mobile device. There is much to be said for opening up school facilities after normal hours so that OS students and others can make use of the computer infrastructure that the Government has invested so heavily in. However, since OS programmes typically do not require daily attendance, it is unlikely that students would have sufficient access to study materials if these are available exclusively online. Ideally, OS students should have daily access to an Internet-enabled computer or mobile device, either at work or at home, before web-based delivery of content is feasible.

A 2007 survey conducted by the International Telecommunication Union (ITU, 2009, pp. 91 & 93) revealed that only 38 out of every 1000 Ghanaians use the Internet, while as few as one in every thousand has a broadband subscription. The figures also mask differences arising from users' socio-economic status. In part, this is the result of the cost of an Internet subscription, which exceeded Ghana's average Gross National Income per capita in 2008 (see Table A.6 in *Appendix A*). This factor disproportionately affects those on lower incomes who typically form the majority of open school students. As the costs of hardware and Internet connectivity decrease, the number of households capable of accessing online resources is likely to increase. But, for the present, it is necessary to provide OS students in Ghana with a range of alternative options for accessing and using learning content.

Paper Study Materials

Printed study guides and work books have been the mainstay of ODL programmes for many years and have much to recommend them. They can be used in a variety of environments (e.g. while riding on a bus) and do not require batteries to be recharged, as well as being almost unbreakable, easily portable and unlikely to be stolen (as a laptop or smart phone might be). However, simply offering students the option of making copies of online materials on a computer printer is not cost-efficient and adds considerably to what they must spend to pursue their studies. Printed textbooks offer higher quality, but are also costly for students unless a loan scheme is in place. Because student numbers rarely justify offset printing, many open schools use photo- or digital-copying to produce black & white materials of reasonable quality. In addition to reproduction costs, expenditure on warehousing, packaging and distribution must also be taken into account when self-instructional resources are delivered in paper form.

Offline Delivery

A recent analysis suggests that it may be more cost effective to supply materials preloaded on a low-cost laptop or e-book reader than in paper form (Du Vivier, 2009, p. 65). The cost of the device is recouped through savings on printing and distribution over the life of the course, which typically takes students two to three years to complete. Although the initial investment in hardware may be greater, this delivery system can cost less than paper resources when this capital expenditure is depreciated over time. Where students already own or have access to the required hardware, materials can be down-loaded onto

VCDs/DVDs, cell phone memory cards, USB flash drives or other removable storage devices and distributed to students at the time of enrolment or through the post.

Hosting Digital Resources

Even though the ICT infrastructure in most parts of Ghana may not be robust enough at present to enable content to be delivered exclusively through the World Wide Web, it is desirable for CENDLOS to have its primary repository of self-study materials online. This will facilitate a change-over to fully web-based content as technological innovations are introduced, telecommunications services improved and home or wireless Internet services approach universal coverage. The cost of hosting digital content with a specialised provider of off-site data storage services is quite modest, though such companies are only now beginning to locate in Africa.

At present, however, all Internet traffic in and out of many African countries is routed through Europe, as there are relatively few local Internet Exchange Points (IEPs). This means that when students use their web browsers to access information that may be stored on a server located nearby, that request is channelled first through an IEP outside the country then back again to the server where the information is stored. The response from the hosting server must follow the same route. This arrangement has obvious disadvantages when the bandwidth of a particular Internet Service Provider is oversubscribed or when the main tele-communications links are out of service. For this reason, any digital content produced by CENDLOS for use as OS resources should be hosted outside Ghana until such time as local IEPs are operational.

7. LEARNER SUPPORT SUB-SYSTEM

Learner support in ODL has been defined as “all activities beyond the production and delivery of course materials that assist the progress of learners in their studies (Simpson, 2002, p. 3)”. Such activities can be grouped into the following categories:

- **Administrative Support** – including recruitment, registration/enrolment, distribution of study materials, timetabling of tutorials and study sessions, administration of assignments, maintaining records of continuous or school-based assessments (SBAs), and receiving and accounting for payments of fees or other charges;
- **Academic Advice and Counselling** – advising learners on their course choices; assisting learners to develop study skills and habits; suggesting strategies for coping with the multiple demands of study, work and personal/family life; and counselling learners with individual problems;
- **Tutorial Support** – which may include group sessions, individual advice, assignment marking and feedback on progress;
- **Peer-to-Peer Interaction** – which can be provided through local support networks, student-facilitated sessions, or formal arrangements for students to work together on group projects or assignments;
- **Access to Resources and Technologies** – usually these are made available at study centres where students can attend tutorials, make use of library books, audio-visual equipment and photocopying facilities, gain access to Internet-linked computers and find places for individual study.

The Role of ICTs in Learner Support

Although the technological tools exist for supporting learners entirely on-line, this would not be feasible with the infrastructure currently available for educational purposes throughout Ghana. The issues raised in the discussion above on the use of ICTs to deliver study materials are also relevant to the provision of learner support services. Where students have access to the technology, they can be given the option of availing of certain administrative services, such as online registration or electronic submission of assignments/SBAs, which are facilitated through the use of ICTs. However, the process of virtual tutoring is not as straightforward as providing academic support in face-to-face settings, and online peer-to-peer interactions are only possible when all parties have regular and reliable access to the same level of resources. For these reasons, it is recommended that learner support services for Ghana's open schooling programme be provided primarily through local venues, where students can periodically meet with tutors/mentors as well as availing of other services.

Notwithstanding the above recommendation, one technology that is coming to the fore as a means of supporting OS students is SMS text messaging (SAIDE, 2008). Ownership of mobile/cell phones across Ghana is growing rapidly; a 2007 survey found that 324 out of every 1000 residents had one (ITU, 2009: p. 91). While the cost of a mobile/cell phone subscription is still relatively high (12% of average GNI per capita, see Table A.6 in *Appendix A* of this report), sending/receiving texts is a low-cost way of communicating with students. Bulk SMS services can be used to provide encouragement, remind students of deadlines, alert them to the availability of resources, poll their opinions and preferences, or administer multiple-choice quizzes. In general, bulk SMS services are easier to administer from a

centralised database containing the cell/mobile phone numbers of all students, especially where there is a uniform charge for this service throughout the entire national territory.

Learner Support at Local Level

Although learner services can be centralised, it is preferable that most supports be provided locally. Locally-supplied LS services can more easily accommodate the conditions prevailing in a particular area, such as the:

- use of local languages for publicity, recruitment and supplementary instruction;
- cultural norms, practices and sensitivities of particular ethnic groups;
- limitations in terms of the local infrastructure.

A major challenge in the establishment of a sustainable open schooling programme for Ghana is devising a workable structure for organising service provision in all parts of the country, including areas that are particularly remote and inaccessible. Providing quality education for students in hard-to-reach locations is a problem that many ODL institutions have successfully addressed. Figure 7.1 suggests a range of options for organising learner support services at local level and illustrates the level of influence that CENDLOS would be able to exert under each approach.

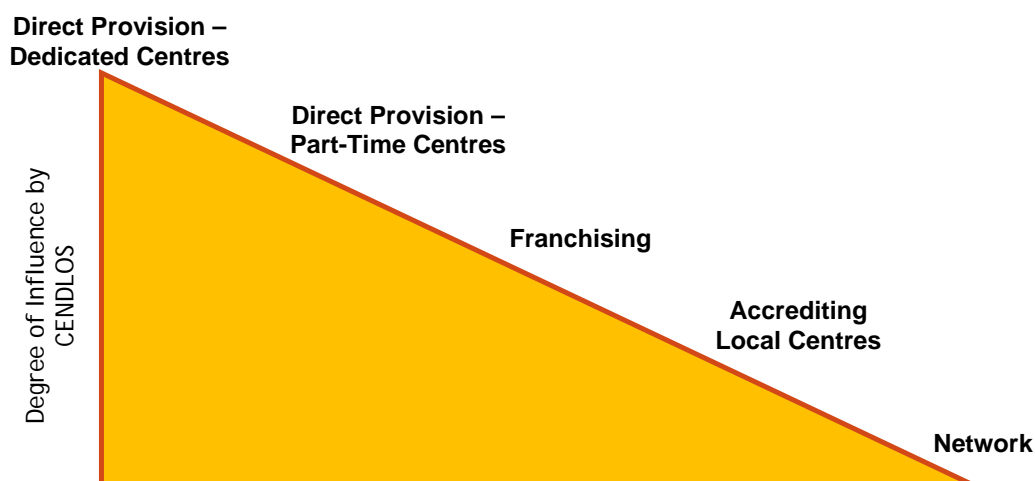


FIGURE 7.1 – Possible Organisational Models for a Providing Local Learner Support

OPTION A – Direct Provision through Dedicated Centres

At tertiary level, some institutions with ODL programmes register students in different areas but require them to attend face-to-face meetings with academic staff by travelling to a central location, though this can be prohibitively expensive. Another approach is for the parent institution to set up local centres where students can go to register, pay their fees, access ICTs, use other learning resources, attend tutorials and sit examinations. Normally this involves renting or building premises in each location, furnishing and equipping them, and hiring local staff. This is the model adopted by the Open Campus initiative at the University of the West Indies, which has set up dedicated centres in fifteen different jurisdictions across the Caribbean.

There is no reason why CENDLOS could not organise an open schooling programme along similar lines in Ghana. Initially, the Centre would need to enter into written agreements with local management bodies for the use of existing schools, community centres, church

halls or other meeting places. In the long term, however, it might prove more cost effective to construct new buildings and hire full-time staff to meet the specific requirements of supporting ODL students. If CENDLOS were to establish its own centres for the exclusive use of those studying at a distance, these facilities could also be made available to students registered with universities, polytechnics and other institutions who are pursuing their studies through the ODL mode.

The chief advantage of the direct provision model is that it would allow CENDLOS to exert a high degree of control over where and how OS programmes are delivered. Under this model, locally-hired staff would be employees of CENDLOS, which could decide not to renew contracts for those who fail to perform according to expectations. Where problems arise at a particular centre, CENDLOS managers could step in to promptly address the concerns of students and other stakeholders.

Establishing dedicated study centres for ODL students would incur significant costs for staffing, as well as for the lease or construction of suitable premises. Typically, such expenditure can only be justified when enrolments in a particular area reach a certain minimum number. Because of this, it may not be possible to sustain such centres in all parts of Ghana. Moreover, it appears as if a number of similar initiatives are already under way to provide community information and resource centres under the ICTs for Accelerated Development Programme, where members of the public can access ICTs and other services (Ghana, 2003, pp. 58 & 60). The development of dedicated centres exclusively for use by open school learners might, therefore, duplicate existing facilities and waste scarce public resources.

OPTION B – Direct Provision through Part-Time Centres

Where large numbers of students in a particular part of the country register for the same ODL programme, it is not uncommon for the parent institution to make arrangements with a local education provider to establish a part-time centre for supporting learners. Teachers and administrators from local schools are normally hired to provide academic and administrative support on a part-time basis outside their normal hours of work. Tutorials for OS learners are usually held in existing school premises, either in the afternoons when conventional classes have ended, in the evenings, at weekends or during school holidays. An example of this organisational model is the Namibian College of Open Learning (NAMCOL), which organises tutorials and other support services for learners at over 100 part-time centres around the country.

While this is a lower cost option than establishing dedicated study centres, it still involves considerable recurrent expenditure. Although it is difficult to estimate how much CENDLOS would be required to spend in order to provide part-time centres throughout Ghana, as a point of comparison the Namibian College of Open Learning employed 80 full-time and 1,200 part-time staff to provide ODL courses to over 28,000 secondary and post-secondary students during the 2009 academic year (January to November) with a total budget of approximately US\$ 10.8 million (NAMCOL Annual Report, 2009). Although at least some of these costs could be offset by student fees, extending open schooling to all parts of the country might not be possible if CENDLOS cannot secure sufficient financial support from central government.

Another major drawback of such an arrangement is that those registered for studies with an open school are often treated as the poor relations of full-time students. Since the local school or other institution where the centre is located has only a limited stake in the success of OS learners, they are apt to give preferential treatment to those registered for conventional classroom studies. Even though an agreement may be in place for OS learners to avail of all the facilities at a local school, in practice they may be denied access to high-

value resources, such as computer rooms, science laboratories, libraries or photocopying facilities.

OPTION C – Franchising

Another option for organising an open schooling programme for Ghana is to sell franchises to local entrepreneurs across the country. The franchising model typically involves the owners of a brand entering into legally-enforceable agreements with one or more franchise holders in a particular area. Certain functions – such as brand marketing and sourcing of raw materials – are carried out centrally, while the individual franchises are obliged to provide a standard menu of services and uniform products, often at pre-determined prices. Individual franchise holders either share profits with the parent company or agree to purchase raw materials and other supplies from it at a fixed rate. Damelin College is an example of an entity that provides secondary, post-secondary and technical courses using ODL methods through franchises across Southern Africa.

Franchising is a commercial model for organising the provision of educational services and is subject to market forces. However, as discussed in Section 1 of this report, the commercial segment of the market for out-of-school secondary education in Ghana may be limited, and there appears to be considerable competition in the form of private schools and tutorial centres. If an attempt were made to roll out an OS programme to all parts of the country, its success would depend on whether local partners can be enticed into franchising arrangements. Under such circumstances, it is likely that centres will spring up in large markets – urban areas with significant populations – while smaller markets in sparsely-populated areas are ignored because of insufficient volume to ensure adequate return on investment. For this reason, the franchising option cannot be recommended for Ghana.

OPTION D – Accreditation of Local Providers

Another possible model for organising a country-wide open schooling programme would rely on local providers to deliver learner support services, while CENDLOS performs certain quality assurance functions through an accreditation agreement. Existing schools, colleges, training providers, NGOs, CBOs and for-profit bodies could apply to CENDLOS to become accredited centres for the provision of open schooling. CENDLOS would then send out a team to inspect each provider's:

- physical facilities and technological infrastructure,
- staffing arrangements and qualifications of academic staff,
- plans for supplying students with CENDLOS-approved self-study materials,
- plans for the provision of tutorial and administrative support,
- internal quality assurance processes,
- business plan and financial standing.

Once CENDLOS is satisfied that the local provider meets minimum requirements for the delivery of an open schooling programme, it would make a recommendation to the regulatory authority. As discussed in Section 9 of this report, this function would be assigned to a proposed new Council for Open, Distance & e-Learning. The Council would then issue an accreditation certificate, valid for a limited period (normally two to three years), after which another inspection would need to be carried out. This model is successfully used by Cambridge Overseas Examinations to accredit local schools and educational institutions that prepare students for its examinations.

Typically, local providers are required to pay a fee to the accrediting body to offset the costs of inspection, but this can be deferred for government schools and other not-for-profit bodies. Thus, this model may generate some income for CENDLOS, but there would also be significant costs involved in carrying out inspections and administering the accreditation

system. Because local providers seek accreditation to give them an advantage over competitors, CENDLOS may come under pressure to restrict the number of centres that can be accredited in a particular region or area. For students who must travel long distances to reach their nearest centre, this may make the service less convenient and affordable. In addition, CENDLOS would not be able to dictate the fees that local providers charge students, though the provision of scholarships for needy students could be introduced as a condition of accreditation.

This model would facilitate the rapid expansion of open schooling throughout Ghana, particularly if the fees collected by local providers or other local arrangements for funding are sufficient to cover all of the direct costs of providing the service. By allowing local bodies to maintain a degree of autonomy and control over what learner services are offered and how they are provided, the centres are given a stake in the process and are likely to feel a greater sense of responsibility for the learners who take part. Local providers are also in a better position to harness resources available in a community to improve the OS services available, through donations, sponsorships or communal activities.

However, if this model was to be adopted for open schooling in Ghana, questions may be raised about the need for CENDLOS to become involved in the accreditation of local institutions, as national arrangements for registering, inspecting and accrediting schools, colleges, training centres and similar bodies are already in place. If there is a need to assure the quality of services offered by local providers of open schooling, it can be argued that existing accreditation bodies are adequate for this purpose. Government-supported schools that wish to offer a programme for out-of-school learners in their area may also object to paying for external accreditation by CENDLOS when they are already being monitored by MoE inspectors. The fear is that this model could lead to a two-tiered system, with accredited private providers and non-accredited government schools offering similar OS programmes for out-of-school learners.

OPTION E - Network

When applied to organisations, a network is a loose association of independent individuals or entities that voluntarily exchange information, share resources or take part in joint activities. Typically, members of a network stay involved only as long as they are deriving some benefit from being connected, but withdraw or become inactive when the association no longer serves their interests. While it would be useful to draw up a directory or register of all the different bodies that provide some form of programme to prepare non-conventional learners for the BECE, WASSCE and TVET trade tests, the voluntary nature of networks would allow CENDLOS to exert only very limited influence over the type and quality of services offered by different providers. For this reason, a network structure would not provide a stable or suitable basis for developing an open schooling programme for Ghana.

Capacity-Building for Local Providers

Regardless of which model is adopted for delivering learner support services, CENDLOS will need to become involved in building capacity among full-time or part-time staff at local centres. Although open schools in different parts of the world employ staff in a variety of positions, there are two key categories that are crucially important in providing a positive experience for ODL learners.

Centre Heads/Coordinators

In many cases, the head of a local tutorial centre for OS programmes performs a variety of functions, including some or all of the following tasks:

- marketing the centre and its programmes, which includes (but is not limited to) a local information & publicity campaign;
- advising potential learners on the most suitable programme for them;

- enrolling learners;
- collecting and accounting for funds;
- distributing study materials;
- maintaining attendance and other records;
- administering assignments or school-based assessments;
- providing informal counselling for learners with academic or personal problems;
- maintaining discipline among learners and enforcing the centre's rules;
- monitoring and supervising the work of tutors and other staff members.

Even when the centre head is not individually responsible for all of these tasks, she or he must still ensure that they are performed by other members of staff.

Given the pivotal role that centre heads play, it is important to provide them with guidance, advice and support as they develop into the role. Typically, this is done through a combination of printed guidelines explaining the recommended procedures and short workshops, with follow-up visits by national or regional staff from a national agency, such as CENDLOS, to answer questions and discuss any difficulties that centre heads may have encountered.

Tutors

Although tutors are just one means of supporting learners, they are widely seen by both students and other stakeholders as the single most important component of a support system (Freeman, 2004, p. 117). Learners place a high value on contact with tutors, particularly when it comes to explaining aspects of a course that are still unclear after reading the study materials provided. In addition, as experts in a particular subject, tutors can provide a broader view and additional examples to illustrate particular topics. They can also give individual feedback on written or practical work so that learners can improve their performance. However, from the point of view of an open school or college, providing tutorials is very costly, accounting for 30% or more of expenditure on ODL programmes (Rumble, 1997, p. 119). For these reasons, decisions about how to provide tutorial support and how frequently such contact will take place should only be made after careful consideration of both costs and potential benefits.

The roles tutors are expected to play differ from institution to institution, depending upon many factors. However, the functions carried out by OS tutors are distinctly different from those traditionally performed by classroom teachers in conventional schools. In the past, classroom teachers took full responsibility for planning a programme in line with the curriculum, and selecting and preparing content, which was delivered through didactic methods such as “chalk-and-talk.” This approach creates a situation where students are largely dependent upon their teachers to tell them what to learn, how to learn it and when it has been learnt satisfactorily.

When learners study through ODL methods, the same level of dependence is not sustainable. Most of the people who study with open schools do so voluntarily. They thus have greater freedom to decide what they want to learn, how best to go about this and (to some extent) when they have had enough learning. Because learners have only intermittent contact with a tutor, the entire curriculum cannot be covered in the time available for tutorials. This means that most of the learning that students do takes place between contact sessions. As a result, the most effective role that a tutor can adopt is that of a resource person, advisor, mentor or learning facilitator.

However, there can be tremendous resistance to this new model of tutoring and learning. Where teachers from conventional schools or colleges are employed to act as tutors, they frequently have difficulty understanding and adjusting to the new role. Normally, this topic forms a central part of any training programme for tutors. ODL learners may also expect the same style of teaching that they experienced at school and adopt a passive stance in

interactions with tutors. When tutors experiment with a facilitative approach, learners may even complain that such teaching is inferior (Rogers, 1986, pp. 123-130). For this reason, open schools must plan ways to prepare their learners (as well as their families and other stakeholders) for what to expect, by highlighting the differences between studying through ODL methods and attending a conventional educational institution.

Open schools train their tutors in different ways. Many provide face-to-face induction training, but this may achieve only limited success in changing the ingrained attitudes and beliefs of teachers about their role and practices. The Botswana College of Distance and Open Learning uses simulation exercises in their induction course in order to translate theory into practice. For example, prospective tutors are asked to mark sample assignments and then reflect critically on how they approached this task. The Commonwealth of Learning recently developed a Manual for the Tutors of Learning Centres in Open Schools, which can be downloaded free of charge at www.col.org/Tutors_OpenSchools.

An alternative to a pre-service course is on-the-job training. For example, Open Access College in South Australia uses a “buddy” system. This involves pairing up new tutors with an experienced tutor-mentor, with whom they can talk informally about their teaching practice over a period of time. Regularly scheduled continuous professional development sessions provide opportunities for such on-going conversations. At these sessions, tutors share examples of how they have managed to introduce particular techniques, while exploring why such experiments have not worked in all cases.

Given the urgent need to roll out an OS programme in Ghana, consideration should be given to the development of a module or course for tutors that can be delivered through ODL methods. A number of tertiary-level institutions around the world have already developed materials for such courses, and it may be possible for CENDLOS to acquire these at little or no cost. Ideally, arrangements should be made for the course to be offered and accredited by a Ghanaian institution of higher education as an elective for students pursuing a post-diploma level qualification in education. This would provide an incentive for practising teachers to register for and complete the course.

8. CERTIFICATION SUB-SYSTEM

The term certification refers to the process whereby an education or training body recognises that a learner has reached a given standard or level of competence. This recognition is usually signified through the awarding of a certificate. Certification is of particular importance because educational qualifications are often used to screen applicants for jobs in the formal sector of the labour market.

However, before any certificates can be awarded, it is necessary to assess the learner's performance. Although continuous assessment is widely used in the classroom, examinations are the most common form of assessment at the end of each phase of formal education. Many countries have established bodies to administer a national system of examinations at the end of primary school, and again on completion of the junior and senior cycles of secondary education. Some open schools make arrangements for their learners to sit for these examinations so that any certificates they receive will be recognised as equivalent to those awarded to school-based students. Alternatively, those registered for an OS programme may sit for examinations administered by a regional or international body that also awards certificates. Finally, an open school may choose to set its own examinations and award its own certificates while seeking to have these recognised and accredited by national or international authorities.

Since the requirements for certification and accreditation must be built into the curriculum, as well as into any learning materials that the open school develops, it is essential to have confidence in the certification sub-system that is selected. Changing over to another process for certification and accreditation at a later date will be very costly. (Freeman, 2004, pp. 61–62).

Existing Arrangements for Certification

As noted in Section 5 of this report, the arrangements for developing curriculum differ for formal education and TVET, and these differences carry through into the processes for assessment and certification.

Formal Education at Junior and Senior Secondary Levels

In 1952, the Governments of Ghana (then the Gold Coast), Nigeria, Sierra Leone and The Gambia (plus, Liberia, which joined in 1974) set up a regional examining board to harmonise and standardise pre-university assessment procedures in what was then British West Africa. Thirty years later, a new Convention establishing the West African Examinations Council (WAEC) was ratified by member states and came into force in 1984. Since its inception, WAEC has devised standards of educational attainment, conducted national and international examinations and awarded certificates that are equivalent to those issued by examining authorities in the United Kingdom.

In Ghana, WAEC administers the terminal examinations for all high school students, including the Basic Education Certificate Examination (BECE, at the end of JHS), the West African Senior [Secondary] School Certificate Examination (WASSCE, at the end of SHS), and the Ghana Commercial Examinations for the General and Advanced Business Certificate. These examinations also serve as selection tests for progression from one level to another in the country's education system. Students register directly with WAEC, which administers all aspects of the examination and certification process. It is highly desirable for open schools to take advantage of the existence of a certification sub-system that enjoys a high degree of public acceptance and confidence. In the Ghanaian context, it is likely that most of those who enrol for an OS programme will seek to prepare themselves for WAEC examinations.

In addition to external examinations, both the BECE and the SSCE include components of continuous assessment, though 'private candidates' for the latter are exempted from this requirement. If continuous assessment marks are required for those who prepare for these examinations through an OS programme, local schools or other centres where learner support services are provided should be assigned responsibility for gathering and maintaining whatever documentation is required by WAEC for this purpose.

Technical & Vocational Education and Training

One of the key objectives of the Council for Technical & Vocational Education and Training is to move towards a competency-based system for assessing and certificating TVEAT in Ghana. In competency-based certification sub-systems, participants typically compile portfolios of evidence to document their ability to perform critical tasks at a particular standard. Initially, competency is assessed by local training providers, whose judgement is externally verified by persons from the relevant industry. National training authorities, such as COTVET, then take responsibility for monitoring the assessment process, moderating results to ensure consistency throughout the country and approving the award of certificates to successful candidates.

Currently, the TVET courses available through the ODL mode are delivered in partnership with training centres or other local providers. In order to conform to COTVET's requirements for certification, these local partners should assist participants to compile and maintain their portfolios, conduct internal assessments and prepare them for any external tests that may be conducted.

Post-Literacy and Adult Non-Formal Education

According to information received during this consultancy, there is currently no national examination to mark the completion of primary school in Ghana. However, for adults who are attempting to climb the educational ladder outside of school, a system of intermediate awards is needed to acknowledge their achievements and to maintain their motivation during what will inevitably be a long journey. Thus, if CENDLOS decides to develop an open schooling programme for adults at the equivalent of upper primary level, it may be necessary to devise a mechanism for assessing and certificating the achievements of successful learners. Consideration should be given to adopting a competency-based approach that conforms to COTVET's procedures, and advice should be sought from the COTVET Secretariat and the MoE's Non-Formal Education Division in this regard.

9. MANAGING A NATIONAL OPEN SCHOOLING SYSTEM

The preceding sections have explored possible ways to organise the provision of open schooling programmes throughout Ghana. However, additional structures are required for the efficient and effective management of a national OS system, including the following components:

- a unit within the Ministry of Education (or other competent education authority) with responsibility for programmes aimed at learners outside the conventional system;
- a mechanism for consulting with stakeholders in the process of formulating policy and planning the future direction of open schooling for the country;
- an acceptable way of funding provision, normally through a combination of user fees, government subventions and other sources;
- one or more institutions to deliver open schooling courses and learner support services to students;
- a mechanism for regulating providers to ensure that the services they deliver meet or exceed minimum quality standards, thus safeguarding the interests of learners and their families;
- a system for pre-service education and training, continuous professional development and certification of open schooling practitioners;
- an association to represent the interests of OS practitioners (though this typically emerges only at a later date).

At present, CENDLOS is the unit within the Ministry of Education, reporting directly to the Minister, with responsibility for promoting open and distance learning at all levels. With only six permanent, full-time staff, it is very much a nascent entity. Discussions are taking place about its future status and possible roles, including most of the above functions. Clearly, some guidance on potential future configurations for CENDLOS and its relationship with other stakeholders is required.

First, it is necessary to point out that potential conflicts of interest are likely to arise if CENDLOS attempts to take on all of the roles outlined above. Current thinking on the role of government ministries/departments suggest that they are most effective when are confined to core functions, such as policy formulation, allocation of available resources and monitoring of performance. Responsibility for implementing policies and delivering services should ideally be delegated to separate entities, under the supervision of an independent regulator that performs a quality assurance function.

In Ghana's formal education system, for example, the MoE's head office looks after its core functions, while schools are allowed a degree of autonomy to deliver services under the supervision of staff in local government office and an independent Inspectorate. This configuration creates a healthy system of checks and balances between different actors and institutions, which is capable of inspiring public confidence by administering the education system in a transparent and equitable manner.

It is clear, then, that CENDLOS cannot “be all things to all men”. It cannot maintain its existing status as a unit within the Ministry of Education, while also trying to be a body for advocating increased use of ODL methods, a resource agency for open schooling, the national regulator and the principal provider of OS programmes.

In the consultant’s opinion, there are two possible pathways for the future development of CENDLOS:

OPTION 1: CENDLOS as the National Open School for Ghana

Perhaps the most common model for structuring OS programmes in developing nations around the world is to establish a national institution for this purpose (see Abrioux’s *Introduction* to Abrioux & Ferreira, eds., 2010, pp. 12-13). Although such open schools can be constituted as civil service structures within a government ministry or department, they tend to be more successful if given a degree of autonomy and flexibility to manage their own affairs, with appropriate oversight. Typically, national open schools incorporate a Materials Sub-System, as well as providing Learner Support services directly to the public, either through dedicated or part-time centres, though partnerships with local organisations are also possible.

OPTION 2: CENDLOS as the Executive Secretariat for a National Council for Open, Distance & e-Learning

The alternative is for CENDLOS to be constituted as the Executive Secretariat for a proposed national Council for Open, Distance and e-Learning (CODEL). Given the importance attached to alternative methods of educational delivery, it is desirable to put in a place a separate body with responsibility for coordinating the development of the sub-sector. Although the time available during this consultancy did not allow for a detailed consideration of the legal issues involved, it is assumed that the National Council for Higher Education and/or the Council for Technical & Vocational Education and Training would be appropriate models for the establishment of CODEL. Under this option, CENDLOS would not be a direct provider of open schooling programmes; instead it would perform various coordination and support functions for the ODeL sub-sector on behalf of the Council, as outlined below.

Such a configuration would ensure that most of the functions required for the efficient management of a national OS system identified above would be carried out, including:

Consultation with Stakeholders

The National Council for Open, Distance & e-Learning would act as a forum for stakeholders to articulate a plurality of views on the future development of ODeL in Ghana and contribute to government policy. At the minimum, CODEL should include representatives from, among others, the:

- Ministry of Education,
- other concerned ministries,
- universities,
- polytechnics,
- Metropolitan, Municipal and District education authorities,
- schools (both public & private) that wish to provide ODeL programmes,
- non-governmental, community- and faith-based organisations concerned with education,
- National Association of Teachers,
- commercial companies involved in the development of ICT infrastructure and e-learning applications.

By bringing together key people with different types of expertise, the Council would become a powerful force for coordinating the orderly development of the ODeL sub-sector, as well as for popularising this approach to education among the general public. The Council would also become a catalyst for inter-institutional collaboration and public-private partnerships in the provision of innovative programmes, as well as the focal point for international cooperation and the promotion of best practice in the field. If requested, the Council could also advise the Minister on the most appropriate mechanisms for funding ODeL programmes at various levels in the national education system.

Regulation of Providers

The Council could also perform a regulatory function for the sub-sector by establishing sub-committees to devise minimum standards for the delivery of quality ODeL programmes at various levels and to formally accredit institutions that provide courses through this mode. As the Executive Secretariat of the Council, CENDLOS would liaise with applicant institutions, conduct pre-accreditation visits, make formal recommendations to the Council and carry out periodic follow-up inspections to ensure that accredited providers are adhering to the prescribed standards.

Resource & Development Agency

As noted in Section 6 of this report, the Materials Sub-System is most efficient when centralised because of the high degree of expertise required and the economies of scale that can be achieved. If CENDLOS is constituted at the Executive Secretariat of CODEL, it could perform a valuable function as a central agency for the acquisition, adaptation and/or development of self-instructional materials for supply to OS providers in a variety of media. CENDLOS could also play an important role in building capacity among local staff to provide high quality ODeL programmes by organising training workshops, facilitating the creation of a community of practice and coordinating an accredited course for tutors and others involved in delivering ODeL programmes.

Liaison with ICTs in Education Initiatives

There is clearly a convergence of interests between those who provide learning opportunities through ODL methods and initiatives to introduce ICTs to support education. Any advancements in the ICT infrastructure available to schools and higher education institutions will be a benefit to both in-school and out-of-school students, while multi-media and digital content developed for those studying at a distance will also be a valuable resource for students in conventional classrooms or lecture halls. For this reason, it is proposed that the functions of CENDLOS and the MoE's ICTs in Education Coordination Unit be merged into a single agency to avoid overlap and duplication, and to ensure that synergies are achieved in the future development of these complementary initiatives.

10. FINANCING OPEN SCHOOLING

The cost structure of ODL institutions differs from that of conventional schools, colleges or universities. Building a conventional educational institution requires a substantial capital investment in infrastructure, while paying the salaries of teachers or lecturers involves high recurrent expenditure. By contrast, where programmes are delivered through ODL methods, new building are often unnecessary as existing facilities can be used after normal hours, and the recurrent costs of paying part-time academic and administrative staff to provide learner support services are relatively modest.

Nevertheless, ODL institutions often incur significant costs for the acquisition or development of self-instructional materials, and these are fixed regardless of how many students enrol for the course over its useful life. For this reason, the unit costs of delivering ODL programmes are higher than for conventional forms of delivery when student numbers are low. Significant economies of scale can only be realised when student numbers over the life of the course go up into the thousands or tens of thousands. For example, the National Institute of Open Schooling in India delivers its OS programmes for over 1 million learners per year at 11% of what it costs the State to provide education for the same number of students in conventional secondary schools. By way of contrast, the cost per student at the Namibian College of Open Learning, with only 28,000 learners in 2007, was 35% of what was spent to educate an equivalent number of students in government secondary schools (DuVivier, 2008).

The Importance of Financial Control

While the use of open, distance & e-learning methods holds out the potential of reducing the unit costs of providing quality education, savings can only be fully realised by exercising strict financial control. Where open schools have their origins in civil or public service structures, there is a tendency to adopt budgeting approaches wherein expenditure is only indirectly related to the number of learners enrolled for studies. Traditional models and norms for staffing in the public service are frequently used in drawing up post structures and staff establishments for such bodies. In addition, narrowly defined job descriptions and lack of flexibility in hiring and firing can lead to overstaffing and relatively low levels of productivity. Continuing to prop up such ODL units through incremental increases in their core funding without reference to outputs can stifle future development. For this reason, CENDLOS should adopt a policy of filling only key managerial, technical and administrative posts through permanent appointments, while making the maximum use of temporary and contract workers in other positions.

A cost-benefit analysis is particularly important when evaluating proposals for the introduction of new teaching and learning technologies, which can consume considerable financial resources without producing any savings or improvement in the quality of service available to students. Technology can only help to reduce costs when it:

- reduces the workload of existing staff;
- substitutes for some other element of production (for example, when digital resources delivered on a DVD substitute for the cost of printing paper booklets)
- displaces costs from the institution to students (for example, where students are required to purchase their own e-book reader or comparable device in order to use electronic textbooks).

Expenditure can also be reduced by:

- registering more students for a particular course,
- prolonging the life of existing study materials,
- limiting the scope of course offerings to those subjects where large enrolments can be guaranteed,

- minimising interactions between tutors and students (Rumble, 2009, pp. 58-61).

Government Subventions

Though the unit costs of open schooling are often lower than for conventional classroom-based learning, it can be fatal to start a national OS programme with the expectation that it will enable government to reduce the amount it spends on education. The economics of education at pre-tertiary level mean that governments will, almost inevitably, need to provide some form of subvention. Moreover, total expenditure on education will increase as the OS programme draws new learners into the system. Nevertheless, emphasising the need to achieve savings can be useful in shaping cost-efficient and cost-effective institutions.

When government policy links financial support for an open school to the number of full-time-equivalent learners it serves, this provides an incentive to increase enrolments and reduce unit costs. Systems where payment is contingent upon results have been decried by education administrators, yet introducing a funding formula in which the number of learner examination passes influences the level of financial resources an ODL institution receives can often contribute to improvements in the quality of services offered. In addition, setting expenditure targets for an open school as a proportion of the amount government spends on conventional, classroom-based education can lead to a leaner and more focused institution that seeks to maximise economies of scale (Du Vivier & Ellis, 2009, pp. 30).

The Ministry of Education's estimates for FY 2010 allocate Gh¢ 526 for each student enrolled in a senior high school (see Table B.2 in *Appendix B* of this report), though it unclear whether this figure includes capital expenditure for the construction of new school buildings or the provision of other infrastructure. While open school learners typically take fewer subjects at the same time, they tend to complete them in a shorter period. Thus, it is fair to assume that they can prepare for the full WASSCE examination over four years, the same time spent by their counterparts in SHSs.

Accordingly, where the *per capita* subsidy to an open school is less than this amount, the MoE will realise a saving compared to the cost of providing additional places in conventional classrooms. Finalising the percentage of the full cost *per capita* that will be used to calculate the subsidy is a matter for further consideration and discussion by MoE, in consultation with the proposed Council for Open, Distance & e-Learning. Similar calculations can be made in relation to subventions for open schools offering TVEAT programmes.

At junior high school level, on the other hand, unit costs at conventional schools are considerably lower, at Gh¢ 207 *per annum*, while *per capita* expenditure for OS programmes is unlikely to be much less than for learners preparing for WASSCE. In addition, because education for full-time students at conventional JHSs is provided free of charge, there may be greater resistance among out-of-school learners to the payment of student fees. For this reason, the Government subvention at this level may need to be higher in percentage terms.

Sale of Learning Materials

The sale of study materials and learning resources produced by open schools may provide a significant revenue stream that can be used to recoup the cost of their development or to cross-subsidise the provision of OS programmes. For example, roughly 10% of total income for the Namibian College of Open Learning comes from the sale of printed study guides for use in place of textbooks in conventional schools. However, as is the case with any commercial market, demand for a particular product is influenced by its perceived quality and utility, by the availability of alternative products and by price.

Recently, CENDLOS Management submitted a proposal to the Ministry of Finance & Economic Planning to raise revenue through the sale of video lessons which have already

been broadcast on Ghana TV. The proposal is based on projected sales of 5,000 units (a full set of VCDs for one year in a single subject) with an average profit margin of 25%, yielding projected net income of Gh¢ 75,000 *per annum*. Although the market for this product includes both those currently studying in schools and out-of-school learners, it is difficult to estimate the potential demand for such materials. With prices ranging from Gh¢ 65 - 94 per unit, the cost of these resources may be prohibitive for all but the wealthiest in Ghanaian society. In addition, potential users may decline to buy the video lessons if they are seen as supplementary to existing resources, such as school textbooks, to which students already have access. Adopting the DVD format as the medium for distributing these video lessons may lower the costs of production, since DVDs can hold much more data than VCDs, thus lowering the sales price and making the materials more affordable.

Given CENDLOS's mandate to produce materials that can be used not only by OS learners but also to enhance teaching and learning in conventional schools, attempting to earn revenue through this stream may not be sustainable. As more and more high-quality learning resources are made available free to users via the World Wide Web, many open schools are discovering that producing their own materials is no longer cost-effective. Instead, they have begun to focus on adding value to the process through the provision of academic and other support services that are responsive to learners' needs.

Thus, CENDLOS should consider adopting the Open Educational Resources model by making all of its existing materials, including both video lessons and study guides, available online free to users. Under this arrangement, those who wish to have their own copies of these resources in off-line form (either printed on paper, reproduced on DVD or copied onto some other form of removable memory) should only pay a modest charge to cover the actual costs of the blank stock and the labour involved in reproduction.

Cost Recovery through Fees

Rumble (2006, p. 89) identifies a global trend towards increasing levels of cost recovery through user charges as part of a wider strategy of 'cost-sharing' in relation to public services. However, where students are expected to meet the full costs of a course, this can restrict access for those living on low incomes and may also contribute to lower completion rates. Fees are often justified on the basis that paying for a service encourages students to take it seriously. Where learners pay a substantial charge for an OS course, they are less likely to drop out and more inclined to apply themselves to their studies. In addition, those who feel they are 'buying' a service are more likely to complain when it does not live up to their expectations, and such feedback can prove useful in highlighting where improvements are needed in OS programmes (Du Vivier, 2009, p. 122).

Currently, adolescents who enrol for studies at both government and private senior high schools in Ghana are required to pay fees, though there was insufficient time during this consultancy to collect information on current charges. In addition, the families of full-time students at conventional schools must bear a number of other expenses, which taken together often exceed the amount collected as fees. These additional costs include levies for the use of school laboratories, libraries and resource centres; charges for stationery and examinations; expenditure for the purchase and maintenance of the school uniform; as well as fares for transport to and from school on a daily basis or, alternatively, boarding charges. In most cases, those studying through an OS programme are not obliged to pay such charges or at least they do not pay as much as full-time students. As a result, the total costs of studying at a distance are often lower than those incurred for attending a conventional school, college or university.

If a cost-recovery model is adopted for determining the level of student fees for OS programmes in Ghana, the ideal arrangement is for the funds collected to cover all student-related variable costs, including direct expenditure for:

- reproduction and distribution of study materials,
- face-to-face tutorials or other forms of academic support,
- marking of assignments or other forms of continuous assessment by tutors,
- administration of the local study centre.

These represent the marginal cost of providing the service, which means that additional students can be accommodated at a particular study centre (provided numbers do not exceed its physical capacity or manageable range) without incurring any extra costs for staff or overheads (see Du Vivier, 2009, pp. 127-128). Effectively this enables each study centre to operate as a self-sustaining enterprise, without any subsidy from central or local government.

Affordability

The preceding discussion has avoided consideration of the financial position of learners (and their parents/relatives) or their ability to pay for education, both of which are extremely important considerations in setting fee levels or determining Government subsidies. Because CENDLOS was established by the Ghanaian Government to provide wider access to education for those who have been historically excluded, it must have due regard for its 'social mandate'. Many of those who fall into this target group (e.g. rural dwellers, women, unskilled men, minorities) have very low levels of disposable income that can be used to pursue their education. Where an open school, college or university is under pressure to increase cost-sharing through higher student fees, there is the danger that the many disadvantaged learners will, once again, find themselves excluded. For this reason, consideration should be given to ways of providing for the neediest learners.

Although many open schools attempt to achieve this objective by reducing fees across the board, this is not advisable. In terms of income foregone, this approach is an expensive way of supporting disadvantaged students. Moreover, for at least some of those who enrol for OS programmes, paying fees does not pose a significant hardship. Instead of targeting those students who are in greatest need of assistance, this approach benefits all students equally, even if they can afford to pay the full cost of their studies. More equitable alternatives include schemes whereby the neediest students can apply to pay a concessionary fee or obtain a study loan or scholarship to cover all or part of the cost of the course. In addition, disadvantaged students can often manage to pay fees if this can be done in instalments rather than all at once (see Du Vivier, 2009, pp. 136-138).

Another issue that affects the affordability of studying through an OS programme is the cost of examinations. Typically, open school learners register for a small number of subjects at a single sitting, in the hope that they can cover the entire syllabus and pass the exam within a single year before moving on to other subjects. However, the current fee structure for the WASSCE exam severely discriminates against those who are studying on a part-time basis. While the cost of entering for a single subject is Gh¢ 51, the charge per subject drops to less than Gh¢13 when a candidate enters for six or more subjects. It is difficult to understand why the charges are so disproportionate as each candidate must pay a separate Entry Fee, which presumably covers the administrative costs of creating an individual computer record. As a matter of urgency, an appeal should be made to the West African Examinations Council to reconsider its fee structure so that potential learners are not discouraged from pursuing further studies through an OS programme.

11. CONCLUSIONS AND RECOMMENDATIONS

There is an urgent need to put in place a national open schooling programme in Ghana. Despite the introduction of free and compulsory basic education as part of the 2007 reforms, at least one million children of school-going age are not enrolled in either primary or junior high school. In addition, less than one in five adolescents between 15-17 years of age attends senior high school or a technical or vocational training institution. Of those who do attend a junior or senior high school, over a quarter of a million leave school each year without any qualifications because they did not sit or failed at least one core subject in their terminal examinations. There are also around 30,000 adults who complete the National Functional Literacy Programme each year and who could benefit from an upper primary equivalency programme. In addition, an unknown number of adults who completed their primary education but never attended secondary school may also wish to upgrade their qualifications.

Providing learning opportunities for these potential learners outside the traditional classroom will involve cooperation between a number of stakeholders. An open schooling programme may be conceived of as a complex set of activities that are grouped into different sub-systems. Although some open & distance learning universities carry out most of these activities internally, open schools often find it more efficient and cost-effective to operate through a patchwork of arrangements with other bodies.

The approach adopted by the President's Special Initiative for Distance Learning and carried on by its successor body – the Centre for National Distance Learning and Open Schooling (CENDLOS) – has been to develop self-instructional materials that complement the curricula and syllabi used in the formal education. This policy enables these resources to be used by both in-school and out-of-school learners, and it should be continued when devising a national OS programme for Ghana. No changes are proposed in the existing processes used by the MoE's Curriculum Research & Development Unit or the Council for TVET, but it is desirable that CENDLOS to be more closely involved.

Ideally, the Materials Sub-System should be centralised in order to achieve economies of scale and to make best use of specialised staff. CENDLOS is well-placed to continue carrying out these functions for the national OS programme, with responsibility for materials acquisition, adaptation and/or development, along with their reproduction and distribution.

By contrast, the Learner Support Sub-System is most effective when provided at local level, so that OS learners do not have to travel long distances to avail of academic and administrative services. The preferred option is for these functions to be carried out by existing SHSs, while CENDLOS performs quality assurance functions by inspecting these facilities and recommending accreditation for those that meet or exceed minimum standards. CENDLOS will also need to support capacity-building for local providers and OS practitioners, especially centre heads and tutors.

Currently, the West African Examination Council administers the external assessment and Certification Sub-System for school-based learners in Ghana, while the Council for Technical & Vocational Education and Training is responsible for these functions within the TVET sector. Most of the learners who register for Ghana's national OS programme are likely to sit for the same examinations (BECE, WASSCE and TVET assessments) as their counterparts in conventional schools. In order to meet the needs of newly-literate adults, it may be desirable to devise an Upper Primary Equivalency Programme for delivery through ODL methods. Ideally, the assessment and certification process for this programme should be practically-oriented and competency-based.

The effective management of a national open schooling programme requires more than just OS providers. In addition, mechanisms need to be put in place to formulate policy and oversee the system, to obtain the input of stakeholders, to raise and allocate funding, to regulate providers and to train open schooling practitioners. Current discussions on the future direction and role of CENDLOS envisage that it will carry out many of these functions. However, if the Centre is to become a direct provider of open schooling services, then a conflict of interest will arise. For this reason, it is recommended that CENDLOS be constituted as the Executive Secretariat of a new Council for Open, Distance & e-Learning (CODEL). CODEL would provide a forum for stakeholders to have an input into plans for the development of this important sub-sector, while CENDLOS would act as a resource and development agency, an inspectorate of local OS providers and a liaison and coordination body for ICTs in Education initiatives.

Although ODL programme can be delivered at a lower cost per student than conventional classroom-based education, strict financial controls must be exercised in order to achieve such savings. No matter which option is chosen for CENDLOS's future development, it is essential to avoid the traditional approach used in the civil service to determine its staff establishment and post structure. It is recommended that only key managerial, technical and administrative staff at CENDLOS be employed on a full-time permanent basis, while other posts should be filled through temporary, part-time or short-term contracts.

Despite the potential to achieve lower unit costs, funding a national OS programme for Ghana is likely to involve some form of government subvention. Although revenue may also be generated through the sale of self-instructional materials to individual students or to schools as a substitute for textbooks, CENDLOS should consider making its materials available as Open Educational Resources, which can be accessed free of charge via the Internet.

Students should also contribute to the cost of their education through the payment of fees. Where fees are set at a level that recoups the full direct costs of providing open schooling services at local centres, then these can operate as self-sustaining enterprises without additional subvention from either central or local government. There are a number of options for ensuring that the neediest in society can still avail of OS programmes, including a concessionary fees scheme, payment by instalments and a scholarship fund.

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Persons Consulted during the course of this Mission

CENDLOS Head Quarters

Permanent Staff

Mr Joshua C. Mallet	Director
Mr Samuel Ofori-Arko	Senior Financial & Administrative Officer
Mr Frank K. Yeboah	Production Officer: Ghana Broadcasting Corporation
Ms Elizabeth Ameyaa Somuah	Stenographer Secretary
Mr Douglas Kofi Aninakwah	Driver
Mr Emmanuel Yaw Behene	Driver

Temporary Staff

Mr Peter Tettey Yamak	Kwame Nkrumah University of Science & Technology, BSc. (Mathematics)
Mr Michael Selorm Gawugah	Valley View University, BSc. (Computer Science)

National Service Personnel

Mr Elliot D.Y. Ayikpah	Cape Coast University, BSc. (Engineering Physics)
Ms Sheila Avorkah	University of Ghana, Legon, BSc. Administration (Accounting)
Mr Francis Owusu Agyekum	Trans Africa College, Adv. Dip. In Journalism & Media Studies
Ms Eunice Kyere-Mensah	Regent University College of Science & Technology, BSc. Management with Computing (Human Resource Management)

Village Communication, Ltd. (video production company for SHS Chemistry)

Mr Emmanuel Oware	Production Assistant
Ms Edna Akwensivie	Graphic Artist
Mr S.O. Peprah	Production Previewer (contract staff) and Chemistry Tutor, Presbyterian Boys SHS, Legon

National Film & Television Institute (NAFTI), University of Ghana (video production for SHS Integrated Science)

Prof. Linus Abraham	Rector
Mr Eugene Odame	Head of Production, NAFTI & Programme Coordinator
Ms Naa Arday	Editor

Prime Time, Ltd. (video production company for SHS Biology)

Ms Florence Appiah	Producer and Editor
Mr Alfred Amoah	Teacher, Francis Xavier SHS & Programme Previewer

National ICT & Science Resource Centre, Ministry of Education

Mr Augustus Owusu-Agyemfra Science Specialist

Rev. Joana Koranteng Science Specialist

Mr Peter Gyamfi ICT Specialist

Council for Technical & Vocational Education and Training (COTVET)

Mr Daniel Baffour-Awuah Executive Director

Ms Ernesticia Director: Finance & Administration

Mr Eugene Tagpenuu Administration Manager: Executive Director's Office

Curriculum Research & Development Division, Ghana Education Service

Ms Sarah Agyeman-Duah Director

Mrs Dina Esi Mantey Deputy Divisional Director

Non-Formal Education Division, Ministry of Education

Mr Charles Darlington Afare Acting Director

Ms Susan D.D. Berdie Deputy Director: Materials Development Section

MICAP Institute of Technology

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ICT Coordination Unit, Ministry of Education

Rev. E-K Dadebo Coordinator: ICT in Education Programmes

Ghana Prison Service, Nsewam Correctional Facility

Mr Chris Larvie Deputy Director of Prisons

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Dr Francis Donkor Dean of Business School, University of Education Winneba, Kumasi Campus and Former Deputy Director, PSI-DL



APPENDIX A – STATISTICAL TABLES

TABLE A.1 - Ghana, Educational Change, AY 2001/02 to 2008/09

	AY 2001/02	AY 2008/09	Percent Increase
Primary School			
Enrolments (P1-6)	2,586,434	3,710,647	43.5%
Percent Female	47.5%	48.6%	2.4%
Gross Enrolment Rates	80.4%	94.9%	18.0%
Net Enrolment Rates	59.4%	88.5%	48.9%
Junior High School			
Enrolments (JHS1-3)	865,636	1,285,577	48.5%
Percent Female	45.9%	46.7%	1.8%
Gross Enrolment Rates	64.2%	80.6%	25.4%
Net Enrolment Rates	30.4%	47.8%	57.5%
Senior High School			
	AY 2000/01	AY 2008/09	
Enrolments (SHS1-3)	207,000	490,334	136.9%
Percent Female	n/a	44.3%	
Gross Enrolment Rates	n/a	33.9%	
Net Enrolment Rates	n/a	17.7%	

Source: Ministry of Education (March 2009) *Education Statistics, 2001/02 to 2008/09 Academic Years*.

TABLE A.2 - Ghana, Education Indicators, AY 2008/09

	Totals	Males	Females
Primary School			
Population (6-11 years)	3,910,349	1,967,784	1,942,565
Enrolments (P1-6)	3,710,647	1,908,232	1,802,415
Gross Enrolment Rates	94.9%	97.0%	92.8%
Net Enrolment Rates	88.5%	89.6%	87.4%
Gross Admission Rates in P1	102.9%	104.7%	101.1%
Net Admission Rates in P1	72.1%	72.7%	71.5%
Completion Rates for P6	79.7%	74.0%	85.5%
Junior High School			
Population (12-14 years)	1,595,620	815,100	780,520
Enrolments (JHS1-3)	1,285,577	685,099	600,478
Gross Enrolment Rates	80.6%	84.1%	76.9%
Net Enrolment Rates	47.8%	47.9%	47.7%
Gross Admission Rates (JHS1)	84.6%	87.3%	81.7%
Net Admission Rates (JHS1)	43.6%	44.0%	43.3%
Repetition Rate (JHS1-3)	3.1%	3.1%	3.1%
Completion Rates (JHS3)	75.0%	79.7%	70.1%
Senior High School			
Population (15-17 years)	1,448,401	743,472	704,929
Enrolments (SHS1-3)	490,334	272,906	217,428
Gross Enrolment Rates	33.9%	36.7%	30.8%
Net Enrolment Rates	17.7%	18.0%	17.4%
Gross Admission Rates (SHS1)	35.0%	37.6%	32.3%
Net Admission Rates (SHS1)	9.7%	9.4%	10.0%
Repetition Rate (SHS1-3)	2.7%	2.7%	2.7%
Completion Rates (SHS3)	n/a	n/a	n/a

Source: Ministry of Education (March 2009) *Education Statistics, 2001/02 to 2008/09 Academic Years*.

TABLE A.2a - Ghana, Children Not in School AY 2008/09

	<i>In School</i>	<i>Not in School</i>	<i>Not in School less Overage Learners in lower level</i>
Primary School			
Population (6-11 years)	3,460,659	449,690	449,690
Overaged Learners	249,988		
Junior High School			
Population (12-14 years)	762,706	832,914	582,926
Overaged Learners	522,871		
Total for Basic Education			1,032,616
Senior High School			
Population (15-17 years)	256,032	1,192,369	669,498
Overage Learners	234,302		

Calculation based on Population of Target Age times NER, assuming that the balance of enrolments in each phase are made up of overaged learners. All figures based on Table A.2

TABLE A.3 - Ghana, Schools, AY 2008/09

	<i>Total Enrolments</i>	<i>Of which: Males</i>	<i>Of which: Females</i>	<i>No. of Schools</i>	<i>Percentage of Trained Teachers</i>	<i>Pupil/ Teacher Ratio</i>	<i>Percent with Electricity</i>
Primary School							
Enrolments by Type of School:	3,710,647	1,908,232	1,802,415	17,881	48.0%	32	
Public	3,041,895	1,570,307	1,471,588	13,510	58.4%	34	
Private	668,752	337,925	330,827	4,371	11.6%	26	
Junior High School							
Enrolments by Type of School:	1,285,577	685,099	600,478	10,213	65.0%	17	
Public	1,064,088	572,867	491,221	7,656	76.7%	18	
Private	221,489	112,232	109,257	2,557	22.0%	14	
Senior High School							
Enrolments by Type of School:	490,334	272,906	217,428	670	83.3%	22	94.0%
Public	441,324	250,122	191,202	493	86.8%	22	97.0%
Private	49,010	22,784	26,226	177	57.8%	18	85.9%

Source: Ministry of Education (March 2009) *Education Statistics, 2001/02 to 2008/09 Academic Years*.



TABLE A.4 - Ghana, Examination Performance, June 2008

	Total Enrolment in Final Year	Total Subject Entries	Total Passes	Percent Pass	Total No. of Failures & Non- Entries	Percent Wastage
BECE (Basic Education Certificate Examination) Core Subjects:						
Mathematics	386,446	336,197	199,849	59.4%	186,597	48.3%
English	386,446	336,245	202,950	60.4%	183,496	47.5%
Science	386,446	336,247	203,670	60.6%	182,776	47.3%
Social Studies	386,446	336,296	198,174	58.9%	188,272	48.7%
					741,141	
WASSCE (West African Senior Secondary Certificate Examination) Core Subjects:						
Mathematics	151,849	135,424	74,614	55.1%	77,235	50.9%
English	151,849	135,305	115,857	85.6%	35,992	23.7%
Integrated Science	151,849	135,094	93,737	69.4%	58,112	38.3%
Social Studies	151,849	135,091	118,483	87.7%	33,366	22.0%
					204,705	
Source: Ministry of Education (March 2009) <i>Education Statistics, 2001/02 to 2008/09 Academic Years</i> .						

TABLE A.5 - Ghana, Digital Opportunities Index, 2005/06

Country/Area	Opportunity	Infra- structure	Utilization	Digital Opportunity Index	Rank in Africa	World Rank
Ghana	0.56	0.04	0.03	0.21	21	142
<i>For comparison:</i>						
Mauritius	0.98	0.43	0.09	0.50	1	58
Nigeria	0.45	0.05	0.01	0.17	29	155
Niger	0.06	0.01	0.02	0.03	51	181
Africa as a whole	0.55	0.08	0.04	0.22		
North & South America	0.87	0.27	0.20	0.45		
Asia-Pacific	0.82	0.26	0.14	0.40		
Europe	0.97	0.50	0.28	0.58		
Source: ITU & UNCTAD (2007) <i>World Information Society Report</i> , pp. 157-163.						

TABLE A.6 - Ghana, ICT Costs, 2008*(as a percent of GNI per capita)*

Country/Area	ICT Price Basket	Fixed Line	Mobile	Broad- band	GNI per capita (US\$)	World Rank
Ghana	41%	10%	12%	131%	\$590	125
<i>For comparison:</i>						
Botswana	4%	4%	2%	6%	\$5,840	63
Nigeria	43%	13%	16%	890%	\$930	131
Niger	72%	58%	59%	249%	\$280	150
United States of America	0.4%	0.5%	0.4%	0.4%	\$46,040	2
Singapore	0.4%	0.3%	0.2%	0.8%	\$32,470	1
Luxembourg	0.5%	0.5%	0.2%	0.7%	\$75,880	3
Source: ITU (2009) <i>Measuring the Information Society</i> , pp. 56-57.						

APPENDIX B – FINANCIAL TABLES

TABLE B.1 - Ministry of Education Overheads (Excluding those shared by CENDLOS)	
	<i>Budget Estimates (Ghana Cedis)</i>
<i>Category of Expenditure</i>	<i>FY 2010</i>
Education Headquarters	
General Administration	1,655,000
Planning, Budgeting, Monitoring & Evaluation	2,390,000
Human Resource & Development	690,000
Statistics, Research, Information & Public Relations	250,000
National Service Secretariat	150,472,000
Internal Audit	134,000
National Inspectorate Board	500,000
GES Headquarters	
General Administration & Finance	4,260,582
Human Resource Development	1,964,717
Inspectorate	71,800
Internal Audit	328,239
GES Council Secretariat	135,960
Supply & Logistics	7,158,273
Regional Services	
Central Administration	86,986,909
Management & Supervision	3,077,615
TOTAL OVERHEADS	260,075,095
<i>These costs have been apportioned on a per capita basis for each level of the formal education system in the table below.</i>	

TABLE B.2 - Average Budgeted Expenditure per Student (Ghana Cedis)						
	<i>Budget Estimates (Ghana Cedis)</i>	<i>Enrolments (Student Nos.)</i>	<i>As a Percent- age of Total</i>	<i>Average Expenditure per</i>	<i>Duration of</i>	<i>Total Expenditure per Student</i>
<i>Category of Expenditure</i>	<i>FY 2010</i>	<i>AY 2008/09</i>	<i>Enrolments</i>	<i>Student per annum</i>	<i>Cycle</i>	<i>over Cycle</i>
PRIMARY EDUCATION	591,616,681	3,710,647	52.29%	GHC 159	3	GHC 478
GES Headquarters	72,475,051					
Regional Services	383,153,341					
Administrative Overheads	135,988,288					
JUNIOR HIGH SCHOOLS	266,283,172	1,285,577	18.12%	GHC 207	3	GHC 621
GES Headquarters	25,109,438					
Regional Services	194,059,736					
Administrative Overheads	47,113,998					
SENIOR HIGH SCHOOLS	257,914,196	490,334	6.91%	GHC 526	4	GHC 2,104
GES Headquarters	165,221,958					
Regional Services	74,722,412					
Administrative Overheads	17,969,826					
TECHNICAL & VOCATIONAL EDUCATION & TRAINING	22,627,764		0.07%	GHC 721	4	GHC 2,886
GES Headquarters	12,892,197					
Regional Services	9,557,714	28,941 F-T Students				
Administrative Overheads	177,853	4,853 P-T Students				



APPENDIX C

POSSIBLE STAFF ESTABLISHMENT FOR CENDLOS

TABLE C.1 - Proposed Staff Establishment						
OPTION 2: CENDLOS as the Executive Secretariat for a national Council for Open, Distance & e-Learning						
					Possible Transfers from Existing Establishment	
COUNCIL FOR OPEN, DISTANCE & e-LEARNING						
Accreditation Sub-Committee						
EXECUTIVE COMMITTEE						
1	Director/Chief Executive Officer				Director	1
2	Private Secretary				Stenographer Secretary	1
3	Coordinator for Corporate Planning & New Business Opportunities					
MATERIALS ACQUISITION DEVELOPMENT & PRODUCTION UNIT						
4	Head of Unit				Production Officer: GBC	1
INSTRUCTIONAL DESIGN & EDITING						
5	Team Leader					
6	Instructional Designer					
7	Instructional Designer					
	Language Editor			piece-work contract		
	Content Editors/Reviewers/Previewers			piece-work contract		
GRAPHIC DESIGN & LAYOUT						
8	Team Leader					
9	Graphic Designer					
	Illustrator			piece-work contract		
10	Web Designer					
11	Web/Desktop Publishing Technician					
	Web/Desktop Publishing Technician			temporary contract (as required)		
MULTI-MEDIA PRODUCTION						
12	Team Leader					
	AV Content Developer			temporary contract (as required)		
13	AV Technician					
14	Interactive Content Developer					
	Interactive Content Developer			temporary contract (as required)		
ACCREDITATION, QUALITY ASSURANCE & CAPACITY-BUILDING UNIT						
15	Head of Unit					
16	AQA Inspector					
17	AQA Inspector					
18	AQA Inspector					
19	Training Co-ordinator					
INFORMATION & COMMUNICATION TECHNOLOGIES UNIT						
20	Head of Unit				National Coordinator ICTs in Education Unit	1
	Programmer			temporary contract (as required)		
21	Systems Administrator					
22	ICT Technician				Technician: ICTs in Education Unit	1
23	ICT Technician				Technician: ICTs in Education Unit	1
FINANCE & ADMINISTRATION UNIT						
24	Head of Unit				Senior Financial & Administrative Officer	1
FINANCE & ACCOUNTING						
25	Senior Accountant					
26	Accounts Assistant: Procurement					
27	Stores Assistant					
HUMAN RESOURCES						
28	HR Officer					
GENERAL SERVICES						
29	Receptionist					
30	Office Assistant					
TRANSPORT						
31	Driver				Driver	1
32	Driver				Driver	1
CLEANING SERVICES					contracted out	
SECURITY SERVICES					contracted out	
32	Total No. of Full-time Permanent Posts				Total No. of Incumbents	9

APPENDIX D – APPRAISAL OF EXISTING PSI-DL/CENDLOS RESOURCES

As part of this assignment, the consultant was asked to appraise the learning resources, which were originally commissioned by the PSI-DL and which CENDLOS is continuing to produce and circulate. During the course of his visit, the consultant was able to view a considerable sample of video lessons in the following subjects:

- JHS3 English
- JHS3 Mathematics
- SHS1 Integrated Science
- SHS1 Chemistry
- SHS1 Biology
- SHS3 Integrated Science
- SHS3 Chemistry
- SHS3 Biology
- SHS3 Physics

The consultant took part in pre-broadcast previews of video lessons in some of the above subjects, which afforded the opportunity to discuss issues with representatives of the production company and the subject expert tasked with ensuring the accuracy of the material.

In addition, the consultant reviewed printed study guides for SHS1 English and for two TVET subjects: *Catering*, and *Block-Laying & Concreting*.

Preliminary Appraisal

There are many positive aspects about the video lessons, including the professional standards of production and (in most cases) the clarity of audio reproduction. A number of features in some of the videos should be retained and used more widely in future productions, including:

- stating the objectives or specific learning outcomes at the beginning of each lesson;
- clear explanations of new content;
- demonstrations of chemistry experiments and biology techniques (these are of particular importance since relatively few schools have fully-equipped science laboratories);
- the use of short scenarios performed by actors to illustrate particular points in real-life situations;
- setting of questions or problems for students to answer or solve as homework before the next lesson and the reviewing of these questions/problems at the beginning of the following lesson;
- the use of a studio audience of students to simulate the actual teacher-learner interaction in the classroom.

However, the effectiveness of the video lessons produced to date for PSI-DL/CENDLOS is limited by a number of factors, including:

- The teaching method adopted in most cases is the lecture. The style is almost completely didactic, relying heavily on a teacher/presenter speaking directly to camera and on-screen text with voice-over. Little or no attempt has been made to facilitate the creativity of effective teachers, who typically use a variety of interactive instructional methods in their classrooms.



- The capacity of the medium to illustrate points with static, animated or moving images is not exploited as much as it could be. Only limited use is made of illustrations, photographs and video clips, while some of these are not appropriate to the topic under discussion (e.g. illustration of organs in the human body as preparation for the dissection of a rat).

The printed study materials display similar shortcomings. The booklet for SHS1 English is simply a transcript of the video lesson and suffers from the inability of the printed medium to reproduce features of AV materials (e.g. discrimination between different sounds). The study guides for *Catering* and *Block-Laying & Concreting* are primarily concerned with the transmission of content, with little effort made to encourage learner interaction with the material. These problems are not unique to CENDLOS, but are common among textbook publishers and ODL institutions that are just setting up processes for the development of self-instructional materials. The primary aim of such publications is the transmission of a particular set of prescribed content, but this is not the same as instruction or learning.

Russell Ackoff is often credited as the first to identify the data-information-knowledge-wisdom or DIKW hierarchy in a 1988 address to the International Society for General Systems Research, but the distinction has been made in the literature from at least the beginning of the 20th Century. Essentially the DIKW hierarchy highlights the importance of processes in the human mind that transform raw data into useful information, which must be further transformed into knowledge, which in turn becomes wisdom by the application of principles and values, as illustrated in the figure below:

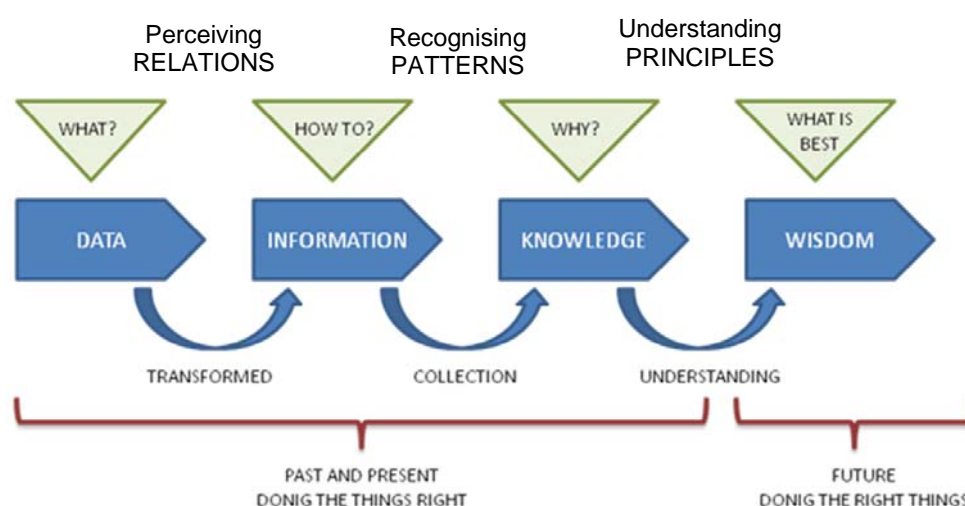


FIGURE D.1 – The DIKW Hierarchy

Source: Fugante, Valeria (2008) *From Data to Wisdom*. Blog retrieved from: <http://blogs.southworks.net/vfugante/2008/09/06/from-data-to-wisdom/>

Self-instructional materials differ from textbooks, reference works and other sources of information in that they are not simply concerned with the transmission of content. Instead, they seek to engage students' faculties to transform data into information and knowledge, and ultimately into wisdom. In ODL, this is achieved primarily by encouraging students to interact with the learning materials in a way that scaffolds the process of knowledge creation (Vygotsky, 1978) and enables them to achieve a higher state of understanding than they would have been able to reach by reading a traditional text. Similar distinctions between

superficial and deeper levels of comprehension or understanding are common in many theories of learning, as illustrated in Figure D.2 on the following page.

Some Suggestions for Improving these Materials

It would be relatively easy to increase the interactivity of existing video lessons by re-editing the master tapes for reproduction and distribution. The re-edited masters should include:

- smaller chunks of content, with breaks after every 7-15 minutes of presentation, in order to make the information easier for students to comprehend and to incorporate into their memories;
- opportunities for students to stop the VCD/DVD and answer questions, engage in activities, undertake exercises, take short quizzes or solve problems;
- sample answers immediately after the VCD/DVD is restarted to enable students to assess their understanding/performance.

For all new video lessons and printed materials, best practice guidelines for the creation of ODL materials should be incorporated at the planning stage. Prior to the drafting of scripts or texts, consideration should be given to some of the more common models of instructional design, such as:

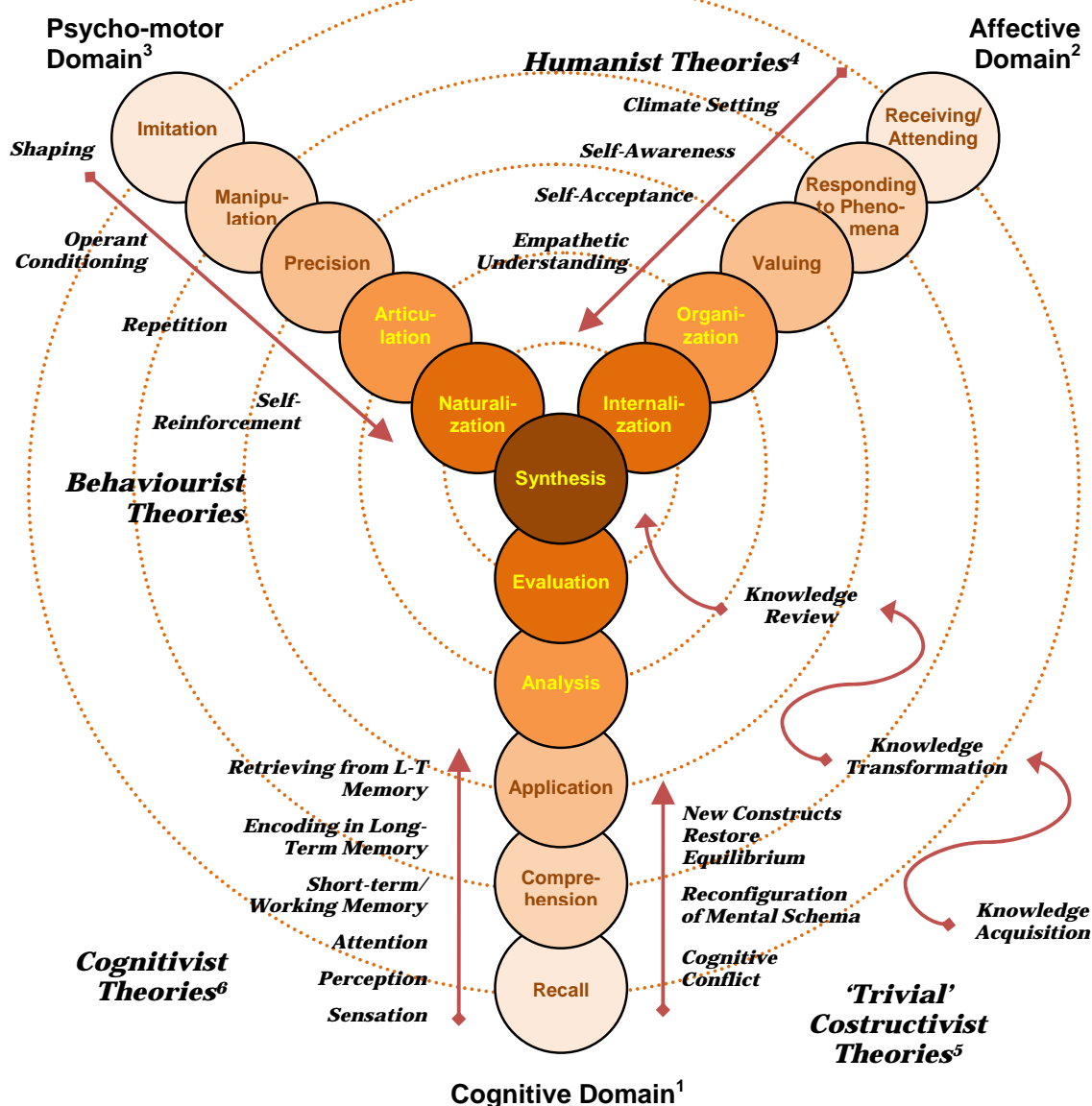
- Gagné's Nine Events of Instruction
- Keller's ARCS model
- Reigeluth's Elaboration Theory.

As a matter of priority, CENDLOS should employ someone with expertise in Instructional Design and ODL Materials Development:

- to advise production companies on how new video lessons can be designed to maximise their self-instructional potential;
- to make recommendations on how existing materials can be adapted for printing, as well as electronic delivery;
- to draw up guidelines for integrating self-instructional materials with other forms of learner support.



FIGURE D.2 – A Unified Model of Learning



Sources:

¹ Bloom, B. S. (1956/1972). *Taxonomy of Educational Objectives – The classification of educational goals, Handbook I: Cognitive Domain*. London, UK: Longman Group. The position of the highest two categories in Bloom's original taxonomy have been reversed, in line with recommendations in Anderson, L. W., Sosniak, L. A. (1994) Bloom's Taxonomy: A forty-year retrospective.

² Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964/1971). *Taxonomy of Educational Objectives - The classification of educational goals. Handbook II: Affective Domain*. London, UK: Longman.

³ Dave, R. H. (1975). *Developing and Writing Behavioural Objectives*. (R J Armstrong, ed.) Educational Innovators Press.

⁴ Rogers, C. (1969). *Freedom to Learn*. Columbus, Ohio, USA: Charles Merrill.

⁵ Bruner, J. (1966). *Toward a Theory of Instruction*. Cambridge, Mass., USA: Harvard University Press.

⁶ Jordan, A.; Carlile, O.; & Stack, A. (2008). *Approaches to Learning*. McGraw Hill.