

M U S T E R

Multi-Site Teacher Education Research Project

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Discussion Paper

18

**Costs and Financing of
Teacher Education in Ghana**

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Ghana
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South Africa
Trinidad &
Tobago



Multi-Site Teacher Education Research Project (MUSTER)

MUSTER is a collaborative research project co-ordinated from the Centre for International Education at the University of Sussex Institute of Education. It has been developed in partnership with:

- The Institute of Education, University of Cape Coast, Ghana.
- The Institute of Education, The National University of Lesotho.
- The Centre for Educational Research and Training, University of Malawi.
- The Faculty of Education, University of Durban-Westville, South Africa.
- The School of Education, The University of the West Indies, St. Augustine's Campus, Trinidad.

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MUSTER is focused on generating new understandings of teacher education before, during and after the point of initial qualification as a teacher. Its concerns include exploring how new teachers are identified and selected for training programmes, how they acquire the skills they need to teach effectively, and how they experience training and induction into the teaching profession. The research includes analytical concerns with the structure and organisation of teacher education, the form and substance of teacher education curriculum, the identity, roles and cultural experience of trainee teachers, and the costs and probable benefits of different types of initial teacher training.

MUSTER is designed to provide opportunities to build research and evaluation capacity in teacher education in developing countries through active engagement with the research process from design, through data collection, to analysis and joint publication. Principal researchers lead teams in each country and are supported by three Sussex faculty and three graduate researchers.

This series of discussion papers has been created to provide an early opportunity to share output from sub-studies generated within MUSTER for comment and constructive criticism. Each paper takes a theme within or across countries and offers a view of work in progress.

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ABSTRACT

This paper considers the teacher education system from a cost and financing perspective. It begins by providing an overview of the education system as a whole and the socio-economic context in which it operates. It then moves to focus on teacher education and analyses enrolment at teacher training colleges (TTCs), tutor qualifications, and teacher supply and demand. It then draws a number of policy-related conclusions from this analysis. It notes that, in the context of significant population growth and teacher attrition, the outputs of TTCs need to increase if pupil-teacher ratios are to be kept at the current level and numbers of untrained teachers in the system are to be decreased. Therefore, to achieve this goal, three possible policy options and their consequences are considered in detail: firstly, resource allocation to teacher training colleges could be increased; secondly, internal efficiency in the TTCs could be improved; or thirdly, more radical alternatives could be considered, involving distance and modular approaches to teacher education, public/private partnerships, and more staged professional development in the early stages of a teacher's career, rather than the current "front-loaded" model of three years of pre-service training. The paper ends with a consideration of some aspects of the proposed "In-In-Out" reform in teacher education, which will increase teaching practice to one year, and highlights some of the cost implications and likely outcomes of such a policy.

CHAPTER 1

CONTEXT

Ghana is located in tropical West Africa and has a population of 18.7 million. Its GNP per capita is US\$390. Between 1990 and 1997 GNP grew at 1.7% annually¹. Over one-third of its people have incomes below the Ghanaian poverty line defined as two-thirds of average income. Population growth average 3% over the last decade. The 0-14 year old dependency rate is 84%² and 44% of the population are under 15 years old. About 36% of the people live in urban areas, two-thirds are primarily dependent on agriculture for livelihoods and income. Life expectancy is around 60 years. About one-third of adults are illiterate and the primary gross enrolment rate is currently 72%.

Ghana gained independence from British colonial rule in 1957 and inherited an academically orientated formal educational system which provided schooling to a minority of the population. Development in the first period after independence was rapid and by 1970 Ghana had consolidated what was recognised as one of the most highly developed education systems in West Africa (EIU 1996: 16). Recurrent government expenditure on education averaged 24% of the total recurrent budget in the early 1970s, substantially higher than the average of 17% for other West African countries (World Bank, 1985 in Glewwe & Ilias, 1996:397). Gross enrolment ratios were increasing, 60% of teachers in primary schools were trained, and the Ministry of Education (MOE) projected that all untrained teachers would be eliminated from the education system by 1975 (Konadu, 1994: 12).

The late 1970s saw a sharp economic decline. GNP per capita fell by 23% between 1975 and 1983. As a result, the real value of government financing for education fell sharply. It also fell as a proportion of GDP from 6.4% in 1976 to 1.4% by 1983. The educational gains since independence were jeopardised and the education system was near collapse (MOE, 1994). Teachers were not paid promptly, there was little supervision or inspection, school buildings fell into disrepair, and the supply of textbooks and instructional materials virtually ceased (Nti, 1997:5, World Bank, 1996:2). The deteriorating working conditions prompted the exodus of trained teachers to find better paid work in other countries, especially Nigeria.

¹ This is a UNESCO estimate (World Education report 2000). Other estimates suggest growth may have been somewhat higher.

² 0-14 year olds as a percentage of 15-65 year olds

Untrained teachers were employed as an emergency measure to fill the gaps with the consequence that by 1982 the percentage of trained primary school teachers had fallen to less than 50%. Despite a steady rise in the number of primary schools, enrolments and teachers between 1974 and 1982, the quality of the education system declined.³

The severity of Ghana's economic problems peaked in 1983 at which time the Government of Ghana launched the Economic Recovery Programme with financial assistance from the World Bank and other development agencies. As an integral part of its plan for economic recovery, the government initiated the 1987 Education Reform Programme (ERP) to reverse the decline in the education system. Its major goals were to expand access to basic education, improve quality and relevance to Ghana's socio-economic needs, and ensure sustainability of the reform programme after the economic adjustment period (MOE, 1994: 13). An Education Reform Review Committee (ERRC) was set up in 1994 to review the achievements of the 1987 ERP. It found that although the ERP had resulted in increases in enrolments and improvements in school facilities, teaching and learning outcomes remained poor.

The overarching message of the 1994 ERRC was that the expansion of access to basic education and increases in physical inputs could not be sustained unless accompanied by improvements in teaching and learning in schools. The Government of Ghana sought to address this issue by launching a new programme - Free, Compulsory and Universal Basic Education (FCUBE) - designed to universalise basic education. Key FCUBE elements include improvements to access through the rehabilitation and construction of school facilities, the fostering of full-scale community ownership and management of schools, and measures to increase education participation by girls and disadvantaged children. Measures to improve the quality of teaching and learning included redesigning of pre-service and in-service training programs to ensure well-qualified teachers, curriculum review and development, and the more adequate provision of instructional materials. The management efficiency component of the programme involved decentralisation and district capacity building, more effective monitoring, supervision and evaluation of education sector activities, and more efficient financial and personnel management.

Specific targets were set under FCUBE to improve the quality of teaching and learning in basic education (primary 1-6 and JSS 1-3). It was intended that the pass rate for admission into the second cycle schools (senior secondary and technical/vocational schools) would reach 80% by the year 2005 and that at least 70% of primary 6 pupils would meet the minimum acceptable standards of performance on a national criterion referenced tests. Repetition and dropout rates were targeted for annual reductions of 1% at each grade level. By 2005 the gender balance in the number of entrants to primary 1 was to be equalised and the gender differential in P6 completion, and JSS 1 entry reduced by 50 percent of its level in 1995. FCUBE intended that universal entry to grade 1 would

³ Using data from the Ghana Living Standards Survey 1988-89, Glewwe & Ilias (1996) find that after controlling for years of schooling, older Ghanaians score higher on Mathematics and English tests than younger Ghanaians. They suggest that this is due to the deterioration in the educational quality in the early 1980s

be achieved by 2000, 95 percent of pupils would complete P6 by 2005 and enter JSS and 85% of those entering would complete JSS3 successfully.

CHAPTER 2

THE GHANA EDUCATION SYSTEM

Basic education in Ghana is made up of 6 years primary (P1-6) and 3 years junior secondary school (JSS1-3). Senior secondary school (SSS1-3) lasts for three years. All post-secondary education is classified as tertiary education and this includes the Polytechnics, Teacher Training Colleges, Agricultural Colleges and Universities. The transition from P6 to JSS1 is essentially automatic unless students' performance is extremely weak. JSS 3 pupils sit a selection examination that determines access to senior secondary school. The curriculum in basic education is designed to achieve literacy, numeracy, and to impart appropriate knowledge of culture and practical skills. Ghanaian languages are intended to be the medium of instruction in lower primary (grades 1-3). Above this level the medium of instruction is English. Implementation of the language policy is uneven as a result of the number of languages and problems with the deployment of teachers from different language groups.

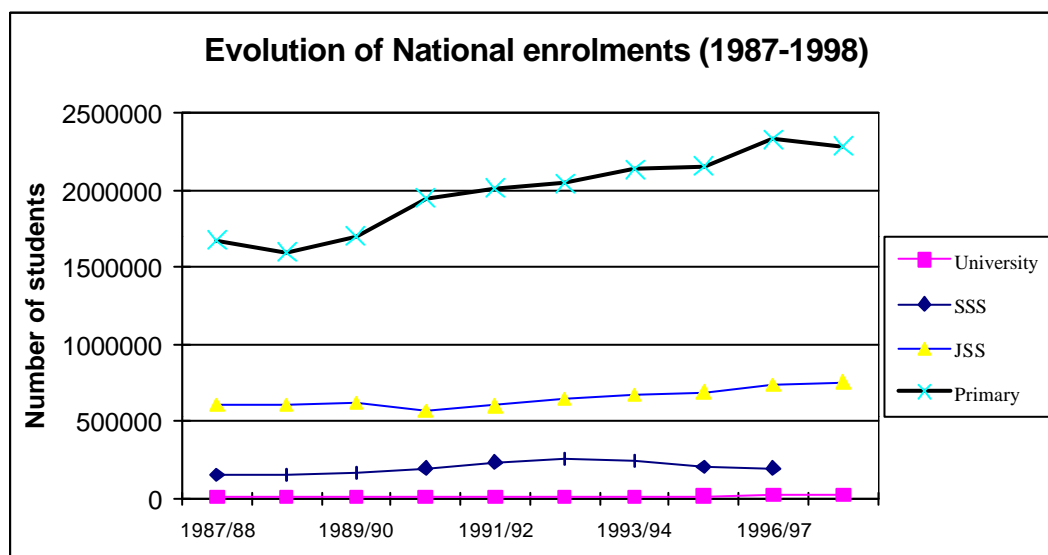
About 2.3 million pupils are enrolled in primary schools, 750,000 in JSS, and 200,000 in SSS. Gross enrolment rates are 72% in primary and 58% in JSS. Less than 2% (about 60,000) are enrolled at tertiary level institutions. In the ten years since 1987 enrolments have not grown rapidly. Table 1 and Figure 2 show the evolution of enrolments. Primary has grown at an average of 3.7%, JSS 2.5%, SSS 3.5% and tertiary at nearly 14%. The school system has been growing slower than the increase in the school age group which average nearly 4% over this period. Moreover, growth in enrolments has been uneven and sometimes negative.

Table 1: Enrolment and Enrolment Growth Rates (1987-1997)

	Primary		JSS		SSS		University	
YEAR	Number	Growth Rate	Number	Growth Rate	Number	Growth Rate	Number	Growth Rate
1987/88	1677074		610094		153284		8565	
1988/89	1598443	-4.7	608690	-0.2	154477	0.8	8609	0.5
1989/90	1703074	6.5	625018	2.7	167640	8.5	9641	12.0
1990/91	1945422	14.2	569343	-8.9	199260	18.9	9997	3.7
1991/92	2011602	3.4	605760	6.4	235962	18.4	11857	18.6
1992/93	2047293	1.8	644976	6.5	257355	9.1	14278	20.4
1993/94	2138635	4.5	676182	4.8	245897	-4.5	15183	6.3
1994/95	2154646	0.7	690558	2.1	209190	-14.9	18000	18.6
1996/97	2333347	8.3	738057	6.9	199028	-4.9	23126	28.5
1997/98	2288768	-1.9	755162	2.3			26684	15.4
OVERALL		3.7		2.5		3.5		13.8

Data for 1997/98 for SSS not available

Figure 1: Evolution of National enrolments (1987 –1998)

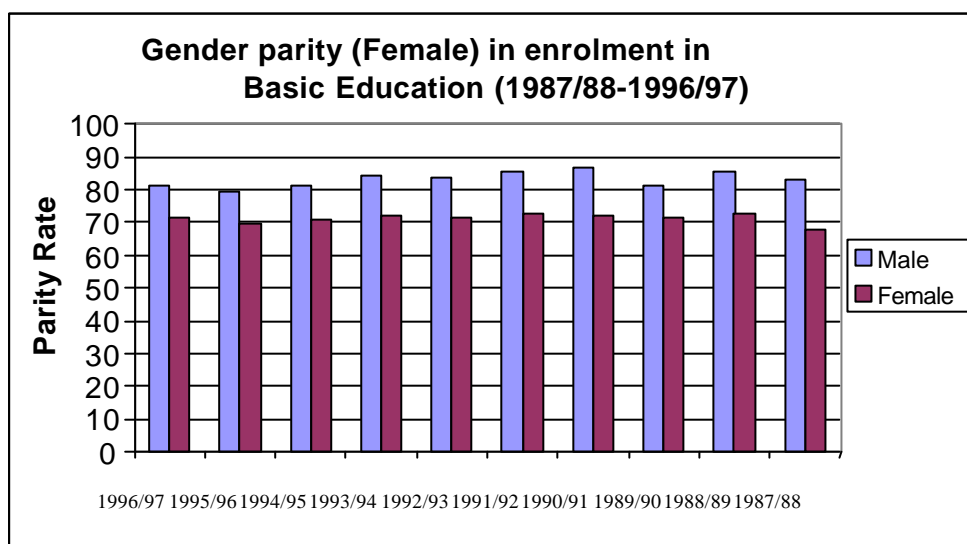


From 1987 to 1994 under the previous educational reform programme average enrolment growth rates were 4.3% at primary, 1.9% at JSS, 8.5% at SSS, and 13.8% at the university level. After the FCUBE was initiated in 1995, the average growth rates fell to 3.2% annually (from 1995 to 1997) at primary, whilst that for JSS increased to 4.6%. SSS fell significantly between 1993 and 1997 for reasons that are unclear.

Gender disparities in enrolment at the primary level are apparent from Figure 2 and these have remained at the level of about a 12% preponderance of males despite the fact that there are more females than males of school age. Policy to reduce the disparity is yet to be reflected in actual enrolment patterns.

The imbalance in enrolment of girls and their retention in formal education has been seen as largely a rural problem. A Girls Education Unit (GEU) was established within the GES in 1997 to promote the education of girls in order to improve access and develop the social capital of women. The specific tasks of the GEU are to increase enrolment of girls in primary schools to equal that of boys by the year 2005, to reduce the dropout rates for girls in primary schools from 30% to 20% and of girls in JSS from 21% to 15%.

Figure 2: Gender parity (female) in enrolment in Basic Education (1987/88-1996/97)



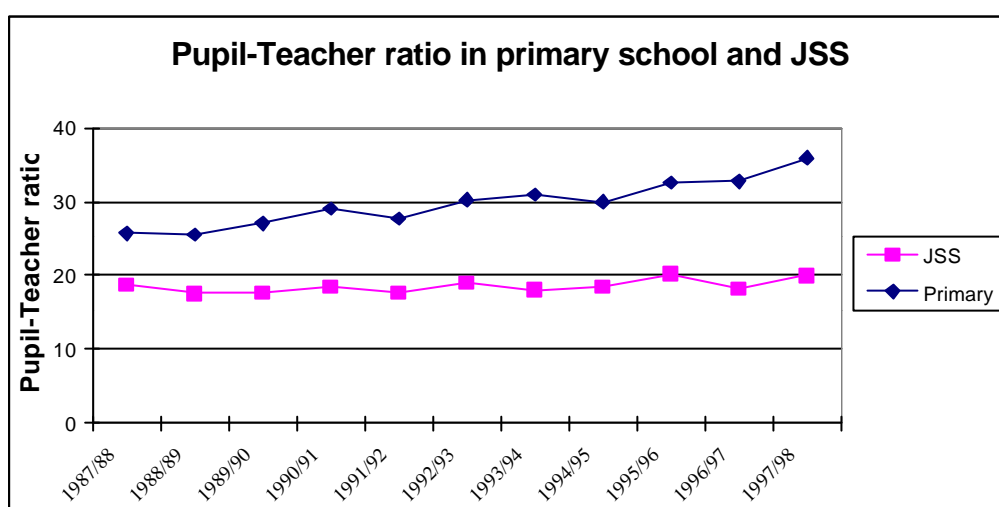
In 1998 Ghana had 12,300 primary schools (11,200 public and 1,100 private), 6,000 JSS schools (5,600 public and 400 private), and 500 SSS schools (450 public and 50 private). There were 64,000 teachers at primary level, 38,000 in JSS, and 11,500 in SSS. Average pupil-teacher ratios were 36:1, 20:1 and 17:1. About 20% of primary teachers were untrained as were 14% of JSS teachers.

Figure 3 shows that since 1987 the PTRs at both the primary and JSS levels have increased from 25.7:1 to 35.9:1 and from 18.7:1 to 20.0:1. This is not what was intended by the educational reform programmes which anticipated improved educational quality arising from reductions in pupil-teacher ratios.

Figure 3 shows that the pupil-teacher ratio at the JSS is a little more than half that at primary and has remained stable. Primary ratios have deteriorated significantly. The output from the training colleges has not been sufficient to replace those leaving primary teaching for one reason or another or to meet the demand created by an increasing school

population. Perennial and acute shortages of teachers persist in rural areas. The Ministry has great difficulty getting trained teachers to accept postings to the rural areas which are perceived as economically deprived. When teachers do accept postings they may not stay for long. There are also some indications that qualified teachers are deserting teaching for better paid jobs in the private sector and in NGOs. Newly trained teachers are bonded to work for a number of years but this system is rarely enforced. Under a new proposal District Assemblies will be asked to sponsor teachers in training in 2001. These trainees will be contracted to teach for three years in the districts that sponsored them. This may or may not improve the supply of teachers to rural areas.

Figure 3: Pupil-Teacher ratio in primary school and JSS



Survival rates are low and continue to militate against the aspirations of the reform programme. Cohort analysis indicates that of 1000 pupils entering primary one less than 600 pupils would complete JSS 3 and just a little above 200 would enter SSS (National Forum document, 1999). Survival rates are shown in Figure 5. It can be seen from Figure 4 that the survival rates are lowest between P1 and P2, and between JSS3 and SSS1 when many leave the system. About 10% of P1 pupils fail to reach P2. In other years the attrition rates average about 4%.. Males have higher survival rates than females.

Figure 4: Cohort Survival Rates from P1 (1987/88) to SSS1 (1996/97) by Sex

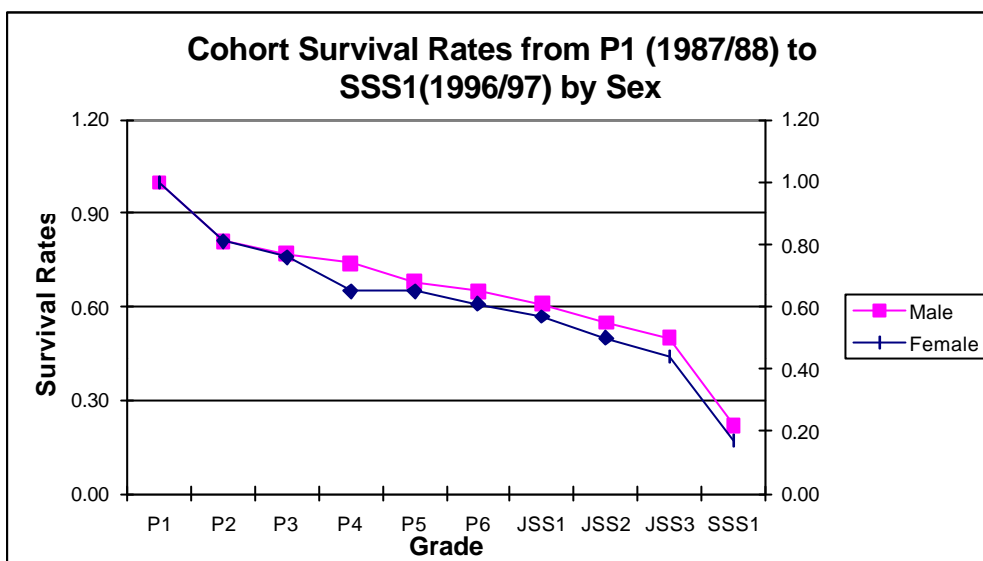
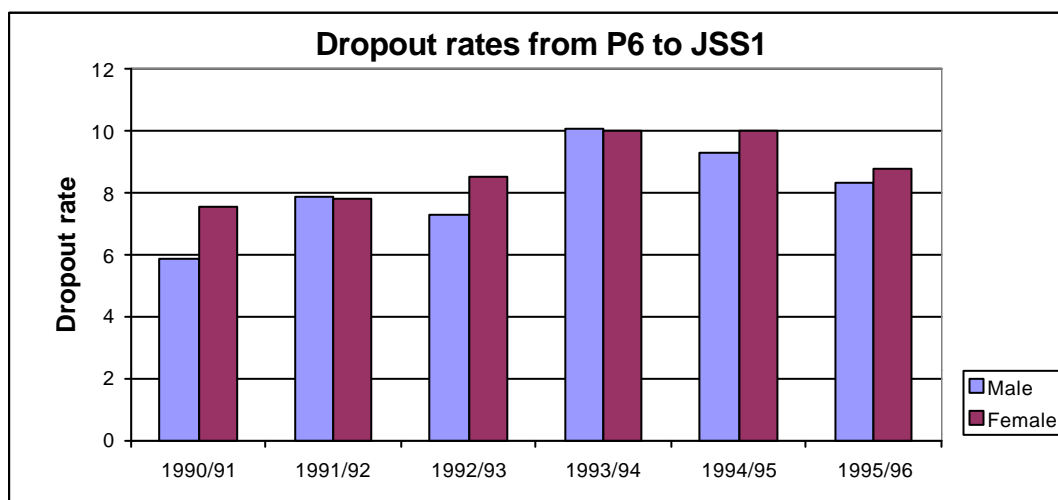


Figure 5 shows the dropout rate from P6 to JSS1, the transition from primary to junior secondary school. After rising in the early 1990's they began to fall. Dropout rates were higher for females from 1990 to 1994 but decreased from 1995 whilst those for males did not follow much of a pattern. The reasons for dropout include the effects of rising school fees, pregnancy, and the opportunity costs of schooling in poor families, especially for girls. Interventions to reduce female dropout are focused on rural areas in the Northern, Upper East, and Upper West Regions.

Figure 5: Dropout rates from P6 to JSS1



Rates of repetition are very low and have remained fairly stable since 1987. Repetition is a result of school level decisions on whether to promote pupils based on school tests at the end of the year that are not standardised. Few repeat and those that do will have had the consent of their parents. What repetition there is highest in P1 (an average of 6.3% from 1987-1995) and lowest in P5 (an average of 2.2%). At the JSS level the rates are lowest in JSS1 (1.2%). Promotion rates are therefore high because of effective automatic promotion for most pupils not because of efficient delivery of the curriculum or high achievement by pupils.

The Criterion Reference Tests (CRT) results from 1994 revealed the poor state of primary school education in the public sector. These results show that children in the public school system performed much worse in English and Mathematics than those in Private Preparatory Schools. The mean scores and percentage of students reaching mastery levels are shown in Table 2. These figures suggest that there is a serious question about the quality of achievement in the public school system since so few appear to reach mastery levels. The 1994 results showed that of every 1000 pupils in the public schools only 15 pupils could reach mastery in mathematics whilst 33 pupils could reach mastery in English. Automatic progression from primary school to JSS has allowed many primary school pupils to progress who may not be academically prepared for junior secondary school and who are hardly literate and numerate. Private schools have the benefit of a more selective entry of pupils from predominantly urban and relatively wealthy households and this may partly explain their superior performance.

Table 2: Results of Criterion-Referenced Test (1994-1997)

Sector	Description	1994		1996		1997	
		English	Mathematics	English	Mathematics	English	Mathematics
Private	PRM	51.40	31.70	56.50	31.00	68.70	40.40
	Mean Score	58.80	47.30	61.00	47.00	67.40	51.70
Public	PRM*	3.30	1.50	5.50	1.80	6.20	2.70
	Mean	31.00	27.70	33.00	28.80	33.90	29.90

Source: Quansah, K.B. (1997), 1997 Report on the Administration of Primary 6. Criterion-Referenced Tests. MOE, Accra

*PRM is an acronym for 'Percentage Reaching Mastery'.

CHAPTER 3

COSTS AND FINANCE

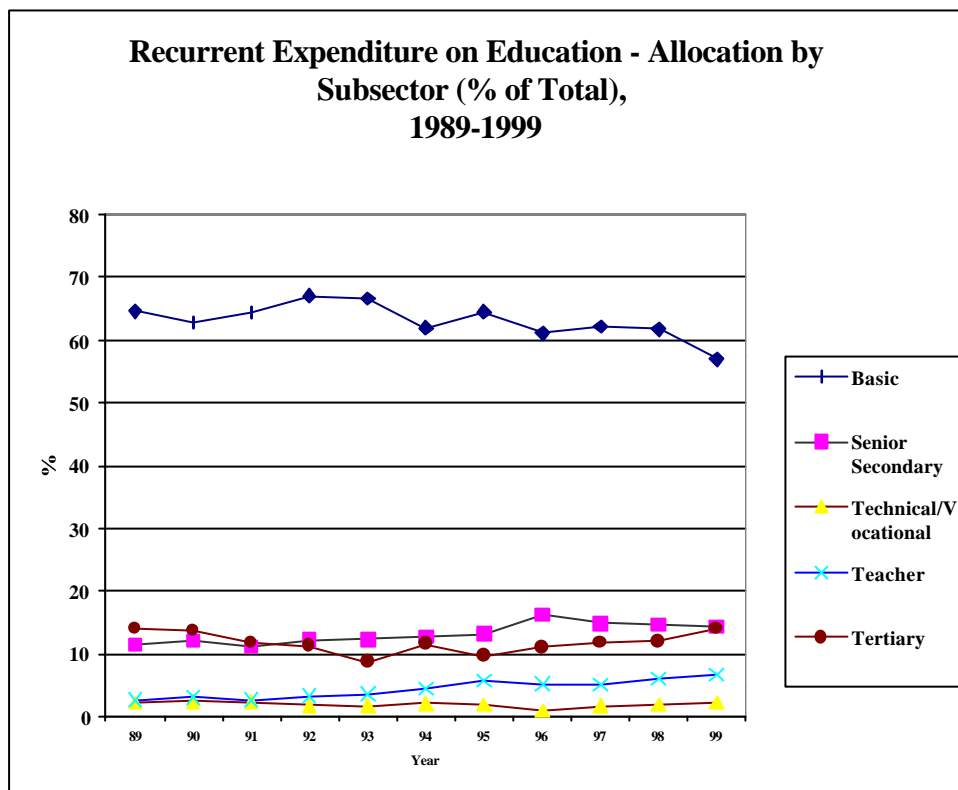
The financing of education in Ghana is shared by government, parents (through the payment of school fees), and supported externally by the World Bank, and other multilateral and bilateral sources. Education's share of the national discretionary recurrent budget increased from 17.0% in 1984 to 35.0% in 1998, while its share of the GDP also increased from 1.5% in 1984 to 3.8% in 1998. Since 1987, over US\$500 million of external funding has been mobilised from international agencies.

The evolution of recurrent expenditure by sector is shown in Table 3

Table 3: Recurrent Expenditure by Sector 1989-1998 (Billions of Cedis)

	Basic Education	%	Senior Secondary	%	Technical Vocational	%	Teacher Education	%	Tertiary	%
1989		64.6		11.6		2.3		2.7		14.1
1990		62.8		12.1		2.4		3.1		13.7
1991		64.4		11.2		2.4		2.7		11.8
1992		67.1		12.3		1.9		3.4		11.3
1993	10	66.6		12.3		1.8		3.6		8.8
1994	10	62.0		12.8		2.1		4.5		11.6
1995	17	64.6		13.2		1.9		5.8		9.7
1996	27	61.1		16.3		1.0		5.3		11.0
1997	33	62.2		14.9		1.7		5.2		11.9
1998	37	61.7		14.8		2.0		6.0		12.0

Figure 6: Recurrent Expenditure on Education – Allocation by Sub-sector (% of Total), 1989-1999



Basic education has accounted for between 60 and 67% of the recurrent budget and has fallen back from its peak in the early 1990s. Within this amount about 35% is spent on primary, 20% on JSS and the remainder on pre-schools. Expenditure on SSS has been rising and now accounts for about 15% of the total despite falling enrolments – the same as tertiary level expenditure. Teacher education has seen its share rise substantially from under 3% to about 6% and is planned to reach 6.7% in 1999. Allocations to tertiary have fluctuated between 11% and 14%.

Table 4 shows the recurrent cost per student by educational level over the period 1992 to 1998 adjusted for inflation using constant 1996 US\$ prices. It indicates that the relative differences in the unit costs by level of education have changed during the 1990s. Unit costs at the primary level have remained fairly constant but have declined in the most recent period despite the FCUBE. Unit costs for JSS have also fallen back to their 1992 levels. By contrast expenditure per student at the SSS has increased significantly. The unit costs of technical and vocational education have increased since falling in the mid-1990s. The unit cost of polytechnic students more than doubled between 1992 and 1998. Over the same period, the university student unit cost declined by 37.5%.

Table 4: Recurrent Public Expenditure Per Student (constant 1996 US\$ - 1996 (US\$1=c1637)

Level/Type of Education	1992	1995	1998
Primary	36.79	44.25	41.75
JSS	66.76	86.55	67.96
SSS	77.44	153.88	168.00
Vocational/technical	188.37	139.04	299.54
Teacher education	246.62	442.60	617.31
Polytechnic	102.18	131.80	209.63
University	1376.94	1123.87	855.91

Source: Adapted from data in MOE, 1999: Appendix 4.1; World Bank 1998: 16

The most dramatic change in unit costs has been the increase in cost per student in teacher education. In real terms, the annual unit cost of teacher education increased by 79.5% between 1992 and 1995, and then by 39.5% between 1995 and 1998. The numbers in the training college system during this period remained fairly stable at around 18000. Most of the costs of teacher training (77%) lie in the payment of salaries and wages of tutors, ancillary staff and the allowances given to teacher trainees. The remaining 23% is used for administration and other running costs. Table 5 shows this.

Table 5: MOE Recurrent Expenditure on Teacher Education (1998)

Division	Recurrent Expenditure Billions of Cedis	Percent of Total
General	820.0	2.2
Manpower	178.3	0.5
Training	105.7	0.3
CRDD Inspectorate	27.6	0.1
Teacher Education	1.0	2.9
GES Secretariat	89.4	0.2
Supply and Logistics	59.5	0.2
Central Administration	5.8	15.6
Teacher Training	28.8	76.9
Management	463.3	1.2
Total	37.5	100.0

CHAPTER 4

THE TEACHER EDUCATION SYSTEM

Teachers for the basic education cycle are trained through a three-year post-secondary full-time programme which is offered in the 38 Teacher Training Colleges (TTCs). Seven TTCs train female teachers only, one is an all-male technical teacher training college, and the remaining 30 are co-educational. With the exception of the TTC in Accra, all others are residential. All colleges prepare teachers for both primary and JSS levels, but at the time of writing plans to introduce college specialisation are being discussed by the TED.

The number of new trainees each year is based on a quota allocated by the MOE. This changes each year and does not appear to be linked to analysis of teacher demand. TTC enrolments in total, and by sex, for the academic years 1992/93 to 1997/98, are shown in Table 6. Since 1993, the number of trainees enrolled has increased by 51%. In general, the population of training college students has been increasing except for a slight fall in 1993/94. Female enrolment as a percentage of total enrolment has also increased from 33 to 38% between 1995 and 1998. Annual output of new teachers has been between 5,500 and 6,000 since 1995.

Table 6: Total Enrolment in Teacher Training Colleges, 1992-1997

Year	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99
Male	-	-	-	12,316	12,935	12,576	
Female	-	-	-	6,110	6,722	7,823	
Total	13,561	13,457	16,447	18,426	19,657	20,399	
Output	4847	6434	5576	5446	5698	6190	5948

Source: Teacher Education Division/GES Statistics 1998/1999

Table 7 shows enrolment at all the TTCs for the academic year 1996/97. The colleges are dispersed among all ten of Ghana's administrative regions and vary in size in terms of trainee enrolment. In 1996, the smallest was Mampong Technical TTC with 241 trainees; the largest Foso with 914. Average enrolment in 1996/97 was 510.

Table 7: Teacher Training Enrolment by College, 1996/97⁴

	TTC	Region	Male	Female	Total
1.	Abetefi	Eastern	274	83	357
2.	Accra	Gt. Accra	317	124	441
3.	Ada	Gt. Accra	306	106	412
4.	Agogo	Ashanti	0	327	327
5.	Akatsi	Volta	456	117	573
6.	Akrokerri	Ashanti	451	169	620
7.	Atebubu	B. Ahafo	341	71	412
8.	Bagabaga	Northern	488	43	531
9.	Bekekum	B. Ahafo	368	81	449
10.	Dambai	Volta	382	70	452
11.	Enchi	B. Ahafo	296	58	354
12.	EP, Amedzofe	Volta	352	86	438
13.	EP, Bimbilla	Northern	483	101	584
14.	Foso	Central	696	218	914
15.	Gbewaa	Upper East	396	55	451
16.	Holy Child	Western	0	377	377
17.	Jasikan	Volta	429	99	528
18.	Kibi	Eastern	375	193	568
19.	Komenda	Central	440	152	592
20.	Mampong	Ashanti	241	0	241
21.	Mount Mary	Eastern	322	139	461
22.	N.J. Ahmadiyya	Upper West	289	70	359
23.	Ofinso	Ashanti	476	149	625
24.	Ola	Central	0	773	773
25.	Peki	Volta	308	111	419
26.	PTC	Eastern	611	187	798
27.	PWTC	Eastern	0	406	406
28.	SDA, Korofidua	Eastern	513	195	708
29.	St Francis	Volta	351	103	454
30.	St John Bosco's	Upper East	495	113	608
31.	St Joseph's	B. Ahafo	546	166	712
32.	St Louis	Ashanti	0	409	409
33.	St Monica's	Ashanti	0	445	445
34.	St Teresa's	Volta	0	311	311
35.	Tamale	Northern	451	140	591
36.	Tumu	Upper West	301	31	332
37.	Wesley College	Ashanti	483	184	667
38.	Wiawso	Western	515	155	670
	Total		12,752	6,617	19,369
	% of Total		65.8%	34.2%	100.0%

Source: TED, GES, 1998

Admission into training colleges follows a two-stage procedure. First candidates are selected who meet the minimum entry qualification. Secondly candidates are invited by

⁴ The total enrolment figure differs from that given in the previous table. It is possible that they were collected by different departments at different times during the academic year or that one is a revised set of figures in the light of more accurate data. It is not clear which set of statistics is the more accurate.

each college for an interview and to sit short tests in core subject areas. Two groups are eligible to apply for entry into the TTCs: 'O' level holders, and non 'O' level holders who sit the Senior Secondary Certificate Examination (SSCE).⁵ The minimum entry requirements for non 'O' level holders are four credits that have to include English and mathematics, and one other pass; 'O' level holders need a minimum of five grade 'Es'. Candidates are permitted to accumulate the minimum requirements over several years if they do not pass at the first attempt. Colleges tend not to admit 'A' level applicants as they often leave for university once they are able to improve their 'A' level grades. Students looking for post-secondary education have a clear order of preference: universities, polytechnics, other further education institutions, and then TTCs. The TTCs receive students from the lower second and third quartiles of senior secondary completers.

Most applicants are between the ages of 20 and 22. It is rare to take people over the age of 35, because of the perceived problems this might cause in terms of relations with other students and tutors. Less than 2% accepted in 1998/99 had taught before. The number attending interviews is roughly double the number of places available. Entry exams are devised and assessed individually by each TTC, and these tests vary greatly among colleges in terms of content, scope, structure and difficulty. Across all TTCs, however, written examinations test applicants' abilities in English and mathematics.

The tutors in the colleges have a variety of qualifications ranging from diploma certificates to graduate level degrees. They can be classified into two broad groups: graduate and non-graduate tutors. The total number of teaching staff in the academic year 1994/95 was 846, comprising 69% graduates and 31% non-graduates. Table 3.4 shows the distribution of graduate and non-graduate TTC tutors by subject for the academic year for 1994/95.

⁵ The SSCE was introduced in 1994 and 'O' levels gradually phased out. 1997/1998 was the last year of 'O' level examinations.

Table 8: Distribution of Tutor Qualification by Subject, 1994/95

Subject	Non-Graduate Tutors	Graduate Tutors
Mathematics	14	96
Science	24	24
Agricultural Science	15	43
Ghanaian Language	1	57
English	75	82
Cultural Studies	1	6
Physical Education	-	38
Life Skills	1	26
Vocational Skills	8	42
Social Studies	60*	4
Accounting	-	3
Religion	10	7
Music	-	29
Technical Skills	-	25
Art	6	16
Total	269	586

Source: Basic Education Sector Assessment School Review, MOE, 1995a

Note: *Social studies tutors consist of those who have studied geography, economics, political science and history, and not necessarily social studies as a discipline

More recent data on the number and qualifications of TTC tutors in 1997/98 reveals an increase to 1,044, and a slight increase in the proportion of non-graduate tutors to 33%. Current policy encourages TTC tutors to gain at least a degree-level qualification. In 1997 female tutors made up only 21% of the total teaching staff. In the same year, the student population of 20,399, and tutor population of 1,044, resulted in an average trainee-tutor ratio of 19.5. If the official trainee-tutor target of 15:1 is applied there is a shortage of TTC tutors.

Table 9: Teacher Training College Tutors by Qualification and Gender, 1997/98

	No of tutors	Graduate Tutors	Non-graduate Tutors	Male	Female
Total	1044	348	696	821	223

Source: TED/GES Statistics, 1997

The TTC curriculum is a three-year Certificate 'A' course for basic education. It provides for three thematic areas - general education (30%); academic education (30%); and, professional studies (40%). General education is comprised of eight 'core' subjects taught in all 38 TTCs. These are basic mathematics, English language, science, Ghanaian language, physical education, cultural studies, education, and agricultural studies. Under the 'academic education' component of the programme, each student takes two elective subjects chosen from science-based subjects (group one) or vocational subjects (group two). Subject availability varies from college to college with some specialising in group one subjects, and others in group two subjects.

Timetabling provides for about 30 forty minute periods a week over three years. Officially, all colleges provide 33 weeks of instruction per year. Colleges, however, have the flexibility to organise their own schedule, but are required to inform the Teacher Education Directorate. During the second and third years, each subject area is divided into two parts: subject knowledge content and subject methodology. The education course is focused on issues related to the theory and practice of education, and does not relate to any specific subject area.

Table 10: Teacher Training College - Core Subject Time Allocation (per week)

Core Subject	Year 1	Year 2	Year 3
mathematics	4	4	0
science	4	4	0
agricultural science	3	3	0
English language	5	5	5
Education	6	6	6
Cultural studies	3	3	0
Physical education	2	2	0
Ghanaian language	3	3	0
Total	30	30	11

Table 11: Teacher Training College - Elective Subject Time Allocation (per week)

Elective Subjects	Students select two subjects from either Groups 1 or 2			
	Year 1	Year 2	Year 3	
Mathematics	2	2	10	GROUP 1
Agricultural science	3	3	10	
Science	2	2	10	
Technical skills	7	7	8	
Physical education	6	6	10	
English literature	5	5	12	GROUP 2
Social studies	5	5	12	
Vocational skills	5	5	12	
life skills	5	5	12	
French	7	7	12	

Teaching practice is officially expected to last eight weeks although the actual time spent appears to be much less, typically five to six weeks. This is largely due to the poor organisation of teaching practice in the schools (Akyeampong, 1997).

An analysis of three TTCs by Akyeampong (1997) revealed during the three year course that only about one-third of the time is spent on activities directly related to classroom instruction and assessment (see Table 2.4). Moreover, this excludes time lost due to tutor absenteeism, tutor lateness, and other regular college disruptions. Consequently, the quality of instruction and assessment suffer.

Table 12: The Breakdown of Official Term Time in Three Colleges

Term	Official Term Time (weeks)	Approximate Contact Time for Teaching and Learning (weeks)		Examination Time (weeks)		Other Activities/Events (weeks)	
1	12	Year 1: 10 Years 2&3: 6	Year 1: 0 Year 2: 0	Year 1: 0 Year 2: 0	Year 1: 0 Year 2&3: 4 Teaching Practice (TP): 1 Orientation/Settling: 1 Sporting Events: 1	Year 1: 0 Year 2&3: 4 TP: 1 Examination preparation: 1 Sporting Events: 1	Year 1: 0 Years 2&3: 4 TP: 1 Examination preparation: 1 Sporting Events: 1
2	11	Year 1: 7 Year 2&3: 3	Year 1: 2 Year 2&3: 2	Year 1: 2 Year 2&3: 2	Year 1: 0 Years 2&3: 4 TP: 1 Examination preparation: 1 Sporting Events: 1	Year 1: 0 Years 2&3: 4 TP: 1 Examination preparation: 1 Sporting Events: 1	Year 1: 0 Years 2&3: 4 TP: 1 Examination preparation: 1 Sporting Events: 1
3	10	Year 1: 7 Year 2&3: 4	Year 1: 2 Year 2&3: 5	Year 1: 2 Year 2&3: 5	Year 1: Exam Preparation: 1 Years 2&3: 0	Year 1: Exam Preparation: 1 Years 2&3: 0	Year 1: Exam Preparation: 1 Years 2&3: 0
Total	33	Year 1: 24 Year 2&3: 13	Year 1: 4 Year 2&3: 13	Year 1: 4 Year 2&3: 13	Year 1: 5 Years 2&3: 13	Year 1: 5 Years 2&3: 13	Year 1: 5 Years 2&3: 13

Source: Akyeampong, 1997

The Institute of Education at the University of Cape Coast has sole responsibility for conducting examinations and certifying post-secondary teacher trainees. The Institute engages examiners to set questions and moderators to check them, and administers the examinations. Selected tutors from the training colleges mark the examination scripts at a central residential marking centre. The examination constitutes 70% of the overall marks awarded to teacher trainees, with the remaining 30% from internal continuous assessment.

Each subject examination consists of two papers. Paper 1 focuses on subject knowledge. Paper 2 covers the subject application (or methodology). Teaching practice (practicum) and 'long essays', in which students have to write on an approved topic related to teaching and learning, constitute separate examinable subjects. Students have to pass the teaching practice before their remaining subjects can be considered for assessment. Candidates are required to obtain at least an average pass mark of 40% in both papers before they are awarded a pass in the subject as a whole. Teaching practice is supervised by college tutors using a one to five grading scale that is related to specified competencies, skills and attitudes in teaching.

CHAPTER 5

TEACHER SUPPLY AND DEMAND

The basic parameters which determine the demand for new teachers in Ghana at primary and JSS level are the growth in the school age cohort, the need to increase participation rates to levels that ensure all children complete the basic cycle, the numbers leaving teaching who need replacing (attrition), and the aspirations to limit increases in the pupil-teacher ratio to maintain quality. In addition those who are currently untrained will need upgrading to minimum levels of qualification to ensure that all teachers are trained.

The age cohort of six year olds was reckoned to be 582,000 1998 (GMOE 2000) of whom 457,000 were enrolled giving an intake rate of about 78%. Primary school enrolment in 1998 was 2.29 million, and 1.31 million at JSS. Gross enrolment rates across the primary cycle averaged about 73% in 1998, having fallen from nearly 80% in the early 1990s. At JSS level gross enrolment rates were stable through the 1990s at around 58%. Over the period from 1988 to 1998 the school age population of 6-14 year olds grew by nearly 4% per annum (GMOE 2000).

Changes in the number of students and qualified and unqualified teachers and the pupil-teacher ratio are shown in Table 13

Table 13: Numbers of pupils, trained and untrained teachers, and pupil-teacher ratios 1988-1998.

	Primary			JSS		
	1988	1993	1998	1988	1993	1998
Pupils	1677100	2047300	2288800	610100	645000	755200
Teachers	65300	67800	63700	32600	33800	37700
Number qualified	37500	46400	51000	22200	25500	32600
Number unqualified	27800	21400	12700	10400	8300	5100
% unqualified	42.6	31.6	19.9	31.9	24.6	13.5
Overall PTR	25.7	30.2	35.9	18.7	19.1	20.0
Qualified teacher PTR	44.7	44.1	44.9	27.5	25.3	23.2

The total number of teachers at primary level has fallen over the last ten years, whilst enrolments have grown by 37% with the necessary consequence that the average pupil-teacher ratio has increased from 26:1 to 36:1. Interestingly the pupil to qualified teacher ratio has remained fairly constant at about 45:1. At JSS level the number of teachers has increased by 16% and the number of students by 24%. Overall pupil-teacher ratios have increased marginally to 20:1 and the pupil per qualified teacher ratio has fallen to 23:1. 12,700 primary teachers and 5,100 JSS teachers are untrained.

Teacher attrition rates are difficult to estimate. Over the period 1988 to 1998 Meruku (2000) estimates that training colleges produced 54,100 teachers who were posted to the basic school system⁶. In 1988 there were about 59,700 trained teachers employed in primary and JSS schools. Ten years later the number was 83,600 – an increase of 23,900 or 40%. Thus the rate of increase in the number of trained teachers employed was a little below 4%. The rate at which newly trained teachers were being posted was averaging about 9% of the number of trained teachers employed. The difference (9-4% = 5%) gives an estimate of the underlying rate of trained teacher attrition from all causes.

There are reasons to suppose that the attrition rate may be rising. Meruku (2000) notes that the intake into UCEW programmes to upgrade Certificate “A” teachers has increased dramatically from about 300 per year in the early 1990s to 2300 in 1999. These teachers study full-time and therefore create temporary vacancies in the schools. If most do not return to primary or JSS teaching after completing their upgrading they will increase the rate of attrition of trained teachers by between 1% and 2%. It is possible, but by no means certain, that attrition rates may rise further if HIV/AIDS follows a similar pattern to that in some Southern African countries where teacher attrition has risen to well over 10% (Kunje and Lewin (2001), Bennell, Hyde and Swainson (2002)).

It is now possible to estimate future demand for teacher training over a ten year period using different assumptions. Table 14 shows the results using a number of basic assumptions. First the rate of growth of the age cohort is maintained at its historic level of 4%. Second, the pupil-teacher ratio remains at 36:1 and teacher attrition is 5% annually. Third, the gross enrolment rate remains constant at 72% in primary and 58% in JSS. The number of new teachers that need to be trained each year is indicated in row 10 for 2000, 20005 and 2010. The additional numbers that would be needed to achieve a GER of 100% are indicated in row 12. Lastly the numbers of untrained teachers requiring training are indicated in row 13. Table 15 reports the same projections for JSS.

⁶ This figure represents those posted. There is no data on how long they may have remained in these postings or if they actually took them up.

Table 14: Future Demand for Teachers at Primary Level

	Year	1998	2000	2005	2010
1	Age group 6 years	582223	629732	766166	932158
2	Primary population 6-11 years	3155758	3413268	4152762	5052470
3	Primary Enrolment	2288768	2475531	3011863	3664391
4	Qualified Teachers	50964			
5	Unqualified Teachers	12725			
6	No. teachers needed at PTR of 36:1	63577	68765	83663	101789
7	No. of teachers in post	63689			
8	New Teachers needed as a result of population growth	2543	2751	3347	4072
9	Teacher attrition at 5%	3179	3438	4183	5089
10	Total annual demand for teachers at constant GER 72%	5722	6189	7530	9161
11	Total number of teachers needed for GER100%	87660	94813	115355	140346
12	Additional numbers needed GER 72% to GER100%	24083	26048	31692	38558
13	No. unqualified needing training	12725			

Table 15: Future Demand for Teachers at JSS Level

	Year	1998	2000	2005	2010
15	JSS population 12-14 years	1309780	1416658	1723581	2097000
16	JSS Enrolment	755162	816783	993742	1209039
17	Qualified Teachers	32647			
18	Unqualified Teachers	5081			
19	No. needed at PTR of 1:20	37758	40839	49687	60452
20	No of teachers in post	37728			
21	New Teachers needed as a result of population growth	1510	1634	1987	2418
22	Teacher attrition at 5%	1888	2042	2484	3023
23	Total number of teachers needed at constant GER of 58%	3398	3676	4472	5441
24	Total number of teachers needed for GER 100%	65489	70833	86179	104850
25	Additional numbers needed GER 58% to GER 100%	27731	29994	36492	44398
26	No unqualified needing training	5081			

The results of these projections show that:

1. If the PTRs and GER remain constant annual demand for new teachers rises from 5,700 to 9,100 at primary and 3,400 to 5,400 at JSS i.e. a total of 9,100 to 11,300 over the period from 1998 to 2010.

2. If all untrained teachers were to be trained over a five year period then demand for training, but not new teachers, would increase by about 2,500 at primary level and 1,000 at JSS⁷ or 3,500 a year.
3. Total annual demand for new primary and JSS teachers rises from about 12,600 a year at the beginning of the projection period to 15,500 in 2005 (the last year of training of the untrained), and to 14,500 by 2010 (after all untrained teachers have been trained). This can be compared to the current total output of about 6,000 per year from the 38 training colleges.

These levels of demand for training are substantially above current capacity. Before reaching conclusions it is important to note some of the factors that may mean the estimates are too high or too low. First we consider factors which might increase demand.

- i). Trained teacher attrition rates may be greater than the 5% assumed, especially for JSS teachers. If greater numbers take up opportunities for study leave and higher level training they may move out of the basic education sector altogether. Attrition rates related to HIV/AIDS may rise. In other countries prevalence of infection is greatest amongst the age group into which teacher education students fall. If attrition rates were to reach 10% the number of new teachers needed each year at constant GER and PTR would increase from about 7,100 to 11,700 at primary, and from 4,500 to 7,000 at JSS by 2005. This would create an additional demand of about 7,100 per year by 2005 to be added to the numbers necessary under 5% attrition giving a total demand of over 20,000 a year.
- ii). Dropout rates appear high from P1 to P2, and from P6 to JSS1. Dropout rates appear to have been falling from an average of about 8% to lower levels (MOE 2000). This will have the effect of increasing the number of students in the system. If the PTR is to remain constant the demand for new teachers will increase, as will the gross enrolment rate. The magnitude of this effect is uncertain but it could add to annual demand for new teachers substantially. If average dropout fell by 1% per year at least 1,000 new teachers a year would be needed. If the historically high dropout between P1 and P2 was dramatically reduced the number needed would be much greater.

The main factors that might reduce demand for new teachers are identified below.

- i). The rate of growth in the school age cohort may slow. This rate is determined for the next six years by those already born. In the long run a fall from 4% to 3% would have the effect of reducing demand for new teachers by 25% but this would only have its full effect nine years after the six year old age group began to shrink. For medium term planning reductions in birth rate occurring now are unlikely to be significant.

⁷ This would also temporarily increase the demand for new teachers assuming that replacement cover was organised for those in training.

ii). If repetition is reduced the flow of pupils through the school system will accelerate, reducing total enrolments. However, repetition in Ghana is already low and appears to be no more than 2% as a result of automatic promotion. The effects of any reduced repetition will therefore be marginal.

iii). If pupil-teacher ratios were allowed to rise, the demand for new teachers would diminish. We can simulate the effect of allowing PTRs to increase from 36:1 to 40:1 at primary and 20:1 to 25:1 at JSS whilst maintaining constant GERs and a 5% attrition rate. The result is that new teachers needed annually would fall from 7,500 to 6,800 at primary and from 4,500 to 3,600 at JSS by 2005, a total reduction of about 1,600. It should be remembered that class sizes are often between 25%-50% greater than PTRs at primary level, and 50% to 100% greater at secondary, as a result of teacher class ratios being greater than 1:1. Increases in PTR are therefore not desirable.

In summary the demand for new teachers, and training to reduce the backlog of untrained teachers, is more than double current output from the Colleges of Education. If attrition rates rise to 10% it will rise to three times current output if PTRs are not to rise.

The prognosis is even more challenging if FCUBE is to achieve its objectives.

If a conservative target is chosen (i.e. the achievement of GER 100% by 2010 for primary and JSS, representing the condition where there are enough school places for all children of school age⁸) additional teachers are needed over and above these estimates which assume that GERs remain constant. The total additional number needed rises from about 24,000 to 39,000 at primary, and from 28,000 to 44,000 at JSS over the period from 1998 to 2010. Translated into annual additional demand, something like 7,000 more new teachers would be needed each year to achieve GER 100% at primary and JSS, over and above those needed to maintain current GERs. This implies a total annual demand of 22,000 to 29,000 depending on the attrition rate chosen. Once GER 100% was achieved demand would fall back to replacement levels of about half these amounts.

⁸ See Colclough with Lewin 1993 for a full discussion of Education for All goals and their definition.

CHAPTER 6

EMERGING POLICY ISSUES

A number of conclusions can be reached from the analysis so far.

First, the teacher education system needs to increase its output substantially if PTRs are not to increase and the proportion of untrained teachers is to be reduced.

Second, the magnitude of increases needed is substantial. Between two and three times current output is needed to maintain the existing GERs, and cover demand generated by population growth, attrition and reduced dropout.

Third, achieving GER 100% by 2010 would require an increase in output of three to four times current levels.

Fourth, these levels of demand could not easily be met by expansion of the current system. It is not feasible to assume that the 6% of the education budget allocated to teacher education could be raised to the levels necessary. Nor is it plausible that increased internal efficiency could result in gains in output of these magnitudes.

Several strategies could address the questions raised by this analysis and the issues identified in the earlier description of the teacher education system. The options can be put in the following way.

1. Increase allocation of resources to teacher education
2. Increase the internal efficiency of the training college system to generate increased output at reduced unit cost by exploring opportunities for costs saving, and improved use of college resources.
3. Consider radical alternatives for the training of teachers which would increase supply at sustainable cost.

6.1 Increased Allocation of Resources to Initial Teacher Education

The share of the recurrent budget that teacher education takes has been rising. Few countries allocate more than 6% of national educational spending to initial teacher education. Currently 6% of the recurrent budget amounts to about US\$14 million. Increasing this through the strategic use of foreign assistance is imaginable given the magnitude of the flows of assistance available. If initial teacher education were to be prioritised within FCUBE it is conceivable that the amounts allocated could be doubled

or tripled for a period against the target of achievement of universal enrolment and a fully trained teaching force working in schools at appropriate levels of pupil-teacher ratio. This observation merely indicates that the financial challenge is not insurmountable.

Two other observations are important. Even if it were possible to expand the financial resources available the current teacher education system does not have the capacity to double or triple enrolments. It should not be assumed that simply increasing the scale of the existing system is the best option given the evidence that MUSTER has accumulated on its efficiency and effectiveness.

Second, we note that a considerable volume of resources is currently directed towards the upgrading of qualified primary and JSS teachers through to diploma and graduate status. These programmes are mostly full-time residential courses which have a direct cost and a teacher replacement cost (i.e. every student is costing more than twice their gross salary to up-grade). They also anecdotally often lead to those who have upgraded leaving primary and JSS teaching.

The key question that has to be addressed is whether some of the public resources used for upgrading should be redirected in the short term to initial training. This would allow the GER to increase and maintain the pupil-teacher ratios at existing levels in line with FCUBE objectives. The present system appears to value the possible increase in quality that might arise from up grading, over the benefits that would accrue from providing more trained teachers to schools which have untrained teachers and very large class sizes.

6.2 Increased Internal Efficiency

The MUSTER studies lead to a number of observations about the internal efficiency of the present system of initial training. First a reminder of existing college costs and financial structure.

6.2.1 The Structure of Costs

Data from 12 colleges indicate that average college costs per trainee are about US\$680 per student. There is a variation from about US\$550 to as much as US\$ 1,000 which, in this sample is unrelated to size. Typically colleges are small in terms of total enrolment (average 450 in this sample and 500 across all colleges) and have about one member of teaching staff to 15 to 20 students. This year college size and student teacher ratios may have been falling as stricter entrance conditions have been imposed.

Table 16: Trainees, Staff, Student Teacher ratios and Unit Costs for 12 Colleges

College	No Trainees	Teaching Staff	Student Teacher Ratio	Unit Cost (US\$)
1	445	23	19.3	553
2	440	22	20.0	592
3	535	28	19.1	614
4	489	21	23.3	686
5	600	41	14.6	676
6	309	20	15.5	459
7	494	34	14.5	940
8	358	22	16.3	727
9	436	27	16.1	550
10	494	34	14.5	637
11	519	22	23.6	688
12	364	20	18.2	1004
Average	457	26	17.9	677

The structure of College financing is unusual in the sense that most of the costs lie in the value of trainees' stipends. This can be illustrated with reference to budgetary data from a particular college for the current year (2000). In this case there are about 320 students, 30 teaching staff, and a total of 48 non-teaching staff.

Table 17: The allocation of a College Budget

Category	Percentage of Total
Teaching Staff Salaries	12.8
Non-teaching Salaried Staff	3.3
Daily Paid Staff	3.9
SSF	2.5
Miscellaneous	0.3
Trainee Stipends	76.8
Vehicle maintenance etc.	0.1
Total	100.0

This specific case confirms MUSTER data across the college sector. Typically across the college sector about 75% of direct costs are in student stipends, 20% in college salaries split between teaching and non-teaching staff about 60/40, and about 5% in no n-salary expenses. College running costs are concealed in this budgetary allocation system. Trainees do not receive the entire value of the stipends since a proportion is held back and used by the colleges for operating costs. Our estimates indicate that about 40% is deducted from payments to trainees and allocated to purchases of food, equipment, learning materials etc.

The scope for cost saving is limited by the main parameters identified above. Increasing the student-staff ratio would reduce costs per student but ratios above 20:1 might be thought to be unsuited to conventional curriculum delivery. The only element of costs

that might be reduced relates to students' stipends. Judgements would have to be made whether that proportion which is withheld is efficiently allocated and whether the proportion of the stipend paid directly to students for living expenses (excluding what the colleges provide in the form of board and lodging) is appropriate. The latter amounts to about US\$ 330 per year, out of a total unit cost of nearly US\$700.

This unusual cost structuring has implications for ways in which efficiency gains might be constrained. A first order analysis of college costs indicates that as currently structured most costs are variable and rise directly with the numbers of students. This is because so much of the cost is in stipends. Increasing average college size from current levels which are small by international standards ought to reduce unit costs as fixed costs are spread over more students. This would not result in significant savings in this system since it is only perhaps 10% of the costs that could be regarded as fixed within different ranges of enrolment. It would be logical and managerially useful to separate budget running costs and student stipends, and separate fixed and variable costs. Currently there appears no incentive to increase the efficiency with which resources are used.

6.2.2 Curriculum and Assessment

We have already noted that the college teaching year is not as it seems in the sense that the actual number of weeks of teaching delivered in the colleges is well below the theoretical maximum (see Table 12). Although 33 weeks are available a year for teaching the real number of teaching weeks is much less. Our estimates suggest that normal teaching takes place for about 24 weeks in the first year, and 13 weeks in the second and third years (excluding a nominal 4 weeks of teaching practice a year). As much as one-third of teaching time is used for other activities, notably very substantial amounts of time in preparing for and taking assessment tasks.

The college tutors we have interviewed frequently referred to the constraints of time on what they could actually do. With looming examinations in mind, overcrowded syllabus, and extracurricular activities there was very little time, in their view, to engage in learning activities that required extensive exploratory or reflective work by students. This had the effect of compelling them to resort to lectures and note-taking. We frequently observed the interest shown by students in pamphlets that had been written by tutors for sale to students. These pamphlets were in actual fact lecture notes using past examination questions as examples and were very popular.

Fully 9 weeks out of 33 weeks are being used in years 2 and 3 of the existing curriculum for examination preparation and sitting. This does appear excessive. Increasing active learning time could improve the quality of learning and might lower failure rates. Failure rates of 20%, an average across the Colleges, increase unit costs per trained teacher by a similar amount and represent wastage, especially if failure is not retrieved by successful resitting.

6.2.3 Curriculum and Teaching Loads

The way in which teaching is organised has important implications for curriculum delivery. In the training colleges almost all the teaching is organised in a classroom and scheduled according to subject specific contact hours with tutors. This means that often a tutor's teaching load is viewed strictly in terms of the fixed contact time with students. A common complaint from tutors is that their teaching load is excessive and that this makes it unrealistic to expect them to provide learning experiences of kinds that would potentially increase their teaching workload. It raises all sorts of questions for curriculum delivery in the colleges.

For example, if for reasons of providing rich professional learning for students, tutors are encouraged to provide a wider range of learning opportunities, what are the implications of this for their teaching loads? Are tutors currently heavily loaded and how should we conceptualise teaching loads? Is it possible, or indeed reasonable to reduce tutor-student contact hours and increase student group work vis-à-vis projects, investigations, reflective assignments and individualised study, to take advantage of the possibilities these offer for improving learning to teach?

MUSTER has analysed tutors' teaching loads in two colleges, to ascertain whether the much referred-to impact of teaching load on instructional practice reflects lack of management efficiency or is an organisational problem. The distribution of students on each of the programs in the two colleges used for this analysis are shown in Table 1

The overall staff-student ratio is as follows: College A – 1:15, College B – 1:21. Colleges A and B run slightly different programmes

Table 18: Number of Tutors and Student Distribution by Number in Each Programme for 1999/2000

College	No. of tutors*	Programme/Number of students			
		GTTP	PTP	SSP	Total
A	45	500		197	697
B	35	470	256	-	736

*Number of tutors excludes Principals of the colleges

GTTP – General Teacher Training Programme, PTP – Primary Training Programme, SSP – Subject Specialist Programme

The Ghana Ministry of Education (MOE) policy on staff recruitment stipulates that staff-student ratio should be 1:15 and tutors should teach between 32 – 36 periods a week (a period = 40 minutes). Based upon this policy, College A has a high staff-student ratio of 1:21 and College B a ratio of 1:15 which satisfies the official requirement.

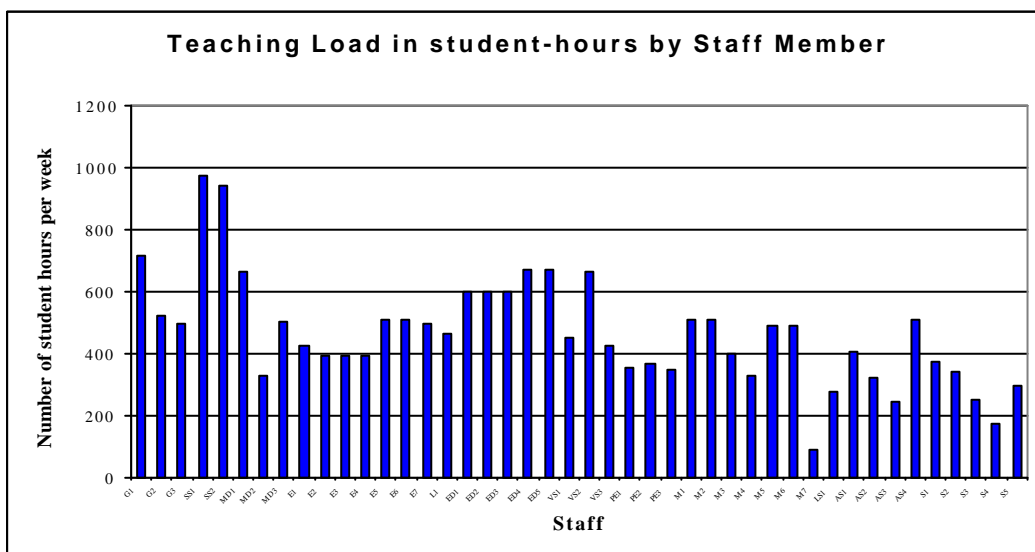
If one makes the assumption that a tutor teaches *different* student groups of 15 students for each period, the following results can be deduced. For a staff-student ratio of 1:15, a tutor has to be in a classroom with teaching contact with a minimum of 480 students (15 students per period x 32 periods) and a maximum of 540 students (15 students per period

x 36 periods) a week. This actually results in an official teaching load in *student-hour* terms ranging from 320 per week to a maximum of 360 student-hours per week.⁹ . What is the actual teaching load in the colleges and how do they compare with the official figures?

Using *actual* teaching loads the average teaching load in student-hours for WTC is 458. The estimated contact time with students is 12 hours, the average number of periods per week is 17 (ranging from 3 –18). The average tutor is engaged in teaching 278 student periods each week. In College A the tutor-student ratio is 1:15 as recommended. Tutors have larger loads in terms of student periods than implied by the guidelines. However this is achieved by using group sizes which average 40. The consequence is that the average number of teaching hours a tutor actually teaches is only 12 per week for the weeks of normal operation. Our data illustrate a wide range of teaching loads across the tutors which arises from their specialisations, the elective choices that students make, and choices made about teaching group size. Most tutors teach both first and second year courses and therefore have to prepare material for both.

Figure 7 shows the staff teaching loads in terms of contact hours and student teaching hours delivered by the teaching staff (excluding the Principal and Vice-Principals) in the subjects offered in College A.

Figure 7: Teaching Load in student-hours by staff member - College A



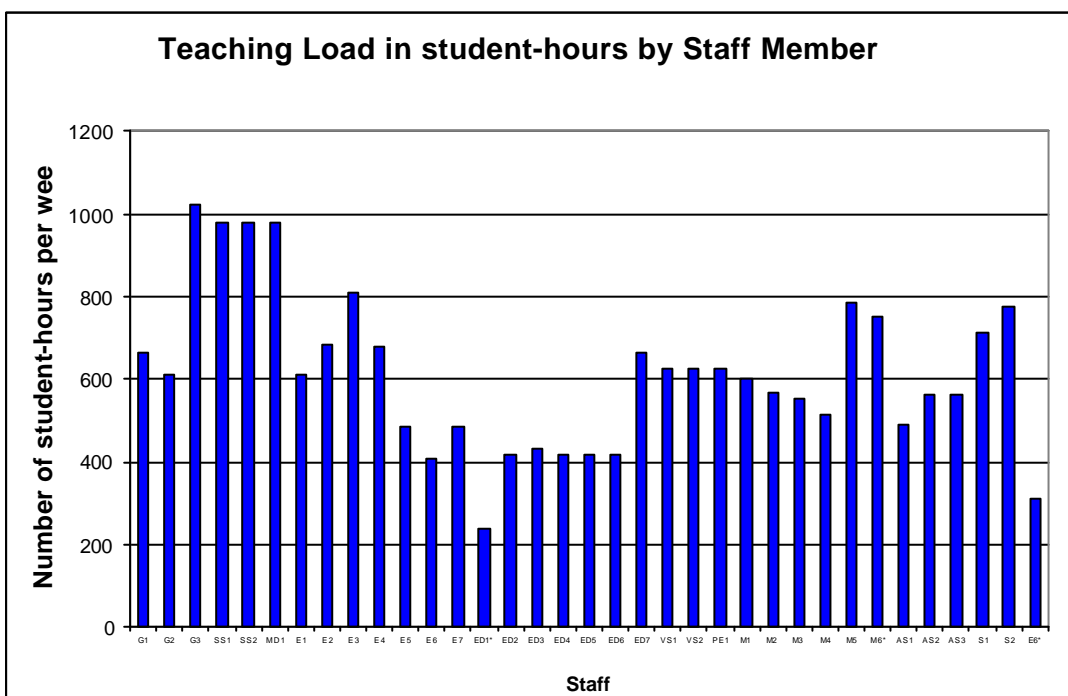
Although 71% of tutors teach more than 360 student hours per week, they are actually in contact with student groups for 12 hours on average. Inefficiencies arise from uneven

⁹ Student-hours appears to provide a better picture of workload. Each period of 40 minutes for a 32 or 36 period schedule works out to be a minimum of 21.3 contact hours and a maximum of 24 contact hours respectively. In student-hours terms this is between 320 – 360. (i.e. 21.3 x 15) Therefore the higher the value of student-hours the greater the work load because of the number of students to deal with and its implications for the organisational demands of student learning.

work loads across staff with different specialisations, whereby some are relatively heavily loaded and others have fewer periods with small groups.

In College B none of the tutors is able to meet the MOE minimum teaching load of 32 periods a week, partly because the college has a favourable staff-student ratio. Figure 2 shows the staff teaching loads in terms of contact hours and student teaching hours delivered by the teaching staff (excluding the Principal and Vice-Principals). The number of student periods a tutor works in a week ranges from 51 to 736. The average is 363 student teachers a week, a figure much higher than that of College A. Tutors teach on average 7 classes in a week and most work at two different levels. The average class size is 52. The average teaching load in student-hours a week is 614 which is considerably higher than College A and 97% exceed the notional Ministry guidelines. However tutors teach on average 12 hours a week, the same as in College A, because of the larger average group size.

Figure 8: Teaching Load in student-hours by staff member College B



E6 belongs to two different departments, E1 and M6 are Vice-Principals of the College

Recruitment of staff is done exclusively by the Principal of a College whose only guiding rule is to keep within the officially recommended staff-student ratio of 1:15. It is clear that the guideline is also sometimes ignored. It also leads to situations where some departments are understaffed and overburdened whilst others are overstaffed and under-utilised. For example, although College A has the full complement of staff (using the 1:15 ratio), the social studies department has only two tutors teaching a total of 70 periods a week, whereas the science department has five tutors teaching a total of 48 periods a week. The physical Education department has three tutors sharing a total of 27

periods a week. It would appear from the analysis of teaching load in the two colleges that the problems emanate from both organisational structure and curriculum demand.

Issues about staff-tutor ratio and tutors workload are complex and their resolution may not be simple as they raise a lot of challenges that touch on policy, politics and practice. Nevertheless, any serious attempt to improve curriculum delivery to yield positive professional learning outcomes will need to face the challenges it presents. Certainly more research into this is required, particularly analysing data from all the 38 teachers' training colleges in Ghana to see the patterns that emerge, which colleges are managing better and why.

The data we have do indicate that there may be some scope for more efficient utilisation of staff. Average class contact times of 12 hours per week (2 hours per day) do not seem excessive especially when coupled with the large amounts of time allocated to assessment tasks. Group sizes could be smaller with larger numbers of contact hours, if it was thought this would improve the quality of learning. More fundamentally the problem of efficient utilisation of staff revolves around the relatively small size of Colleges, the number of subjects in the curriculum and the willingness and ability of tutors to teach two or more subject areas. A review of policy in these areas might produce opportunities to expand enrolment and maintain student contact and deepen learning experience with modest increases in staff-student contact time. Currently Colleges do not appear to have an obvious incentive to manage staff time more efficiently. Teaching group sizes are not monitored and more rather than less effective deployment brings no clear benefits to the College.

6.3 Reflections on the Proposed “In-In-Out” System

A policy decision has been made to adopt an “In-In-Out” model of initial training to replace the current three-year full-time “In” programme. This would reduce the period in College to two full-time years followed by a year of supported teaching practice in schools leading to a final examination and certification. The details of this new system are emerging. Materials are being developed to support the “out” year and the college curriculum is being adapted for a two-year cycle. Many of the details of how the system will work are yet to be determined and this makes analysis of its potential benefits problematic. It is useful, however, to offer some preliminary observations related to finance and to problems of increasing output of trained teachers.

As we have seen the costs of the current system of teacher education based in the Colleges are substantial. Each trainee incurs direct public expenditure of about \$700 per year, making the cost of training a teacher about \$2,100 over three years. During this time trainees do not teach, except during their teaching practice. There is therefore a notional opportunity cost of three years of a primary teacher's salary (about (US\$600-1,800 per year) to be added to the \$2,100 if a full costing is to be made.

If an “In-In-Out” system were adopted the consequences might be as follows.

First, output of the Colleges would increase by 50% assuming College plant were utilised at the same level of intensity as is currently the case. New trainees could be admitted during the “out” year. Thus each training cohort across the College system would increase from about 6000 to about 9000. After three years annual output would rise to 9000 with the completion of training of the existing cohorts.

Second, assuming no additional teaching staff were recruited to the Colleges, costs per trained student would fall. The reduction would depend on whether staff could cover whatever additional workload was generated by students during the “out” year over an above their current workload. If additional staff were employed savings would be reduced pro-rata.

Third, no additional non-teaching staff would be needed unless infrastructure was required to support trainees at a distance. Costs per student arising from this category might then fall.

Fourth, there might well be increases needed in the non-salary budget if the frequency of school visiting was increased and more material support needed to be produced (self-instruction manuals etc).

Fifth, currently about 40% of students’ stipends are withheld for College running expenses. Presumably student teachers would receive the whole subsidy if they were working in schools, not the 60% currently paid directly to students.

Under the “In-In-Out” proposals the cost per graduate is unlikely to fall significantly. This is because the bulk of costs are in student stipends which would continue to be paid. Any reductions in costs related to college salaries per student would only affect the 20% of unit costs which is currently allocated for this purpose. Simply put if staffing costs per graduate fell by 20%, the net effect would only be a fall in overall unit costs per trained teacher of about 5%. And this assumes no significant additional costs arising from in-school support in the form of substantially increased school visiting and/or allowances to school staff to mentor trainees.

A simple comparison can be made between conventional three-year training and “In-In-Out”. Table 19 does this. The assumptions are: that overall unit costs are about US\$ 700 per year, in-college costs do not vary, for the third year support is provided which is costed at 25% of teaching staff salaries, 10% of non-teaching staff salaries, and 50% of non-salary costs. Student stipends remain unchanged. The result is that the overall cost of a trained teacher falls from US\$2,100 to US\$1,969 – a reduction of about 6%. Since the output from “In-In-Out” would be 9,000 not 6,000 after three years, the total costs of initial training would rise by $50\% - 6\% = 44\%$.

Table 19: comparisons of Costs between Conventional and ‘In-In-Out’ (US\$)

	Teaching Staff Salaries	Non-teaching Salaries	Stipends	Non-salary	Overall Unit Cost
First Year College Cost	84	56	525	35	700
Second Year College Cost	84	56	525	35	700
Third Year College Cost	84	56	525	35	700
Total Cost	252	168	1575	105	2100
‘In-In-Out’					
First Year College Cost	84	56	525	35	700
Second Year College Cost	84	56	525	35	700
Third Year College Cost	21	6	525	18	569
Total Cost	189	118	1575	88	1969

The main reservation to this analysis, which shows only marginal cost savings per trainee, is that real and substantial savings arise if student teachers in their ‘out’ year perform some or all of the normal duties of teachers in schools. If they take responsibility for classes, thus releasing other teachers to teach other classes, then they add to the numbers of teachers in post. Their stipend can be thought of as a salary, and there is no notional replacement cost. This may or may not be what is intended. If it is not then ‘In-In-Out’ is not much cheaper than the existing system. If higher levels of support than those assumed in this model were to be provided (e.g. through allowances to school staff to support trainee students actively), then ‘In-In-Out’ could be more expensive than the current system.

One further reservation is apposite. ‘In-In-Out’ may dilute contact time between College staff and students during the period in College. It is possible internal timetabling decisions will result in larger group sizes. This is because in each College the same total numbers of students will be grouped across two years rather than three. If this occurs the number of teaching contact hours per tutor will fall by up to one-third. If this occurs, although costs will appear similar, the experience of students and their contact with staff will be diminished.

CHAPTER 7

SOME MORE RADICAL ALTERNATIVES

None of the options we have explored would be sufficient to meet the levels of demand for new teachers identified in the analysis of supply and demand. Though the financing of substantially increased initial teacher education to increase the probability of achieving the goals of FCUBE is imaginable with external support, the mechanisms necessary to provide expanded output without reduced quality are unclear. Exploring the scope for cost savings within the pattern of college budgeting remains attractive, better use could be made of learning and teaching time, and more efficient timetabling and deployment of staff could have benefits. Taken together these could not result in a doubling or tripling of output. At best “In-In-Out” will increase output by 50% three years into the future. Are there any other options which could be explored to meet the needs of FCUBE?

First, as already noted, significant training capacity and public subsidy is currently allocated to upgrading trained teachers. This is desirable but the question is whether it should take precedence over the need to expand initial training. If the judgement is that initial training is more critical to FCUBE then some of the resources currently invested should be redirected. One possible pathway would be to shift upgrading activity towards distance and modularised programmes which can be completed without long periods of full-time attendance and full pay release time. To progress through initial training at Certificate level, through a Diploma to degree level currently takes seven years or more of full-time study, which cost at least double the salary cost of a teacher per year. This may be anomalous whilst GERS in basic education remain below 75%.

Second, no use is currently made of capacity that may exist in the private sector to provide training environments for new teachers. The CRIPEQ studies suggest that private schools achieve higher levels of pupil achievement than those in public schools. They are also responsible for educating a substantial proportion of the age group. It may be that opportunities exist to enter into public private partnerships with established private sector providers that could assist in expanding training capacity and in improving quality. The possibilities should be explored.

Third, more radically the demands of FCUBE invite reconsideration of perceptions of the nature of a trained teacher and the career trajectory for professional development. The current system of initial training is heavily front-loaded. Three years of full-time training is expensive and risky. There is no guarantee that those who accept a long period of subsidised training will work long enough to repay the cost through more effective performance on the job. Shortening the initial period of training to one or two years, and arranging sequential periods of subsequent professional development after several years in post, could have several possible advantages. It would provide an incentive to remain in the teaching profession, it would ensure that those invited for further training were still

practising, and it would mean that such training could truly be constructed as continuing professional development, drawing on the experience in the classroom of the kind initial trainees currently do not possess. It might invite the kind of career progression that moved through a series of stages which offered promotion in stages over time to those who applied themselves effectively.

Fourth, if a reality is to be made of more school-based approaches to training, links between Colleges and schools need to be strengthened. MUSTER research suggests that though teaching practice is highly valued by trainees it is often organised in ways which do not take full advantage of its potential benefits. It may not be well supported either from Colleges or by schools, the experience that students have may not provide them with a range of experience across grades and with different types of pupil, and they may experience a largely unplanned induction into teaching rather than one designed to maximise the opportunities to learn good practice. If this were to change one strategy will be to link Colleges and their staff much more closely to clusters of schools, their needs and the needs of school staff in a supportive role. This would have considerable advantages in developing more opportunities to capitalise on the expertise that does exist in schools and bring the theory of teacher education into a closer relationship with the practices of the profession.

Fifth, MUSTER research reveals that the academic achievement of many applicants to initial training is low. Subject up grading, especially in the core subjects of mathematics, science, and languages is very expensive if conducted at College levels of costs. Senior secondary schools operate at much lower levels of cost (about 25% of TTC costs per student) and teach subjects to the levels required for trained basic education teachers. If subject competence is problematic amongst entrants, especially if a substantial expansion in training is contemplated, there may be ways of up grading the academic level of trainees that are much cheaper than those currently employed. If this is a core problem then the possibilities should be explored.

Sixth, the goals of FCUBE are unattainable without a substantially expanded output of trained teachers. There may be no one strategy that could result in increases in supply of the magnitudes that appear necessary. A variety of options should be considered against the financial and planning realities that this analysis reveals. Much could be done to increase the probability of progress towards the goals of universalising enrolment in schools with trained teachers operating at reasonable pupil-teacher ratios. The current system of initial training does not have the capacity to meet the needs. It may also be in need of reinvigoration and some level of reinvention to reflect the need for more effective, and more cost effective, methods of addressing the goals of FCUBE.

CHAPTER 8

CONCLUDING REMARKS

Investment in education, and in basic education in particular, is a central feature of Ghana's economic development strategy and is based on the experience of countries that have made the transition to sustainable economic growth through the promotion of human resource development. Teachers are central to the question of the quality of education which leads to the acquisition of knowledge and skill and which starts at the basic level of education where children are at the formative stages in their development.

Issues relating to cost and financing have often not been as seriously considered in debates about educational development in Ghana as other parameters, for example the organisational structure and curriculum. This has led to a paucity of understanding of the constraints on the development of teacher education and difficulties in making judgements about the value for money, efficiency and effectiveness of current methods of delivery. Education is at the crossroads for many African countries and policies for educational change, often influenced by a global agenda of education for all, may have consequences far beyond the capacities to achieve them. Educational targets that are set in national policy documents can be influenced by fashions, particularly in the current climate of setting international development targets.

Ghana will not see growth in its economy without a teaching work force that is of the right quality, produced in the right amounts and at a cost that is affordable and sustainable. In this discussion paper we have raised questions about all of these in the Ghanaian education system and whether indeed the system is capable of producing teachers in the right quantities to meet targets set by FCUBE at current levels of cost and financing of teacher education.

In examining the data relating to teacher education in Ghana, we have developed an analysis of teacher supply and demand and the implications it has for achieving the goals and targets for FCUBE. We have also put forward some suggestions for the way forward and what the implications might be in terms of cost and curriculum restructuring. Teacher education in Ghana is clearly an expensive business. The foremost question to ask is whether there are alternatives that can guarantee quality and achieve training targets which would allow FCUBE goals to be met. The answer cannot be a simple one, and a combination of several alternative approaches may be the best way to improve the situation. Targets set by FCUBE require substantially increased output which is unlikely to be met through expansion of the existing system alone. Ghana needs to produce teachers at costs that are sustainable and have the potential to maintain and improve quality. Rates of teacher attrition give cause for concern and are related to the status of the profession of primary school teaching, the structure of opportunities for career development (which can lead to promotion out of primary schools in a relatively short

time), and the uncertain impact of HIV/AIDS on career lifetimes. The issues related to teacher education curriculum also need reconsideration (Akyeampong et. al., 2000). Whatever adjustments are made to the teacher education system to improve production targets at sustainable costs, the content and learning experiences of student teachers will remain at the centre of any new strategy. The “In-In-Out” scheme has been accepted in principle and now remains to be detailed in terms of its implementation. Three key concerns need addressing.

1. To what extent will “In-In-Out” contribute to meeting the demand for new teachers? This may require a reconceptualisation of the “out” stage of training by giving the student teacher on his/her “out” stage full responsibility for teaching a class, with strong professional support from regular teachers. If “out” year student teachers do not take such responsibility, and full-time teachers remain in the class room with them, much of the benefit of reduced time in College for teacher supply will be lost. This calls for strengthening school level support structures to make them more effective training grounds, with most of the training at that stage undertaken by teachers and headteachers concurrently on the job. This is not a new idea in Ghana and is a model that many private schools employ in the training of their “untrained” teachers. This has cost benefits: student teachers’ stipends effectively pay for an additional teacher for a year. Ultimately, this is about whether we are willing to rethink our concept of a ‘trained teacher’ as one competent to take responsibility for classes after two years, not three, albeit en route to final certification. A ‘trained’ teacher by current definitions still needs professional support particularly in the first year of teaching. This would simply extend this notion back to the “out” year with reductions in time as the teacher becomes more competent in his/her practice.
2. Secondly, there is the danger that the “out” period will become merely an extension of training college work, with the student teachers spending about the same time as in college in self-study whilst also teaching. This would forego the benefits that might come from an emphasis on the school-based aspects of developing competent practice that could be stressed in the “out” curriculum. It might place a high burden on new teachers engaged in academic study for College courses whilst also managing a full teaching load. That is, the “out” period could become a disguised form of “in” training, only being different because the student teacher spends longer in school.
3. Thirdly, the “In-In-Out” system would raise output from about 6,000 to 9,000 a year after three years when fully operational. Costs per student might be less. Total costs will be more because of the increased numbers. Our analysis draws attention to the fact that any arrangements that require dependence on extensive and elaborate external support to schools during the “out” year will increase the operational cost of the programme and may make it unsustainable without external assistance. In effect, we have to see the two-year in-college period as quite sufficient for what it intends to achieve, and be willing to reduce the content we feel teachers should learn at college to prepare them to teach. However, this reduction must not be seen as devaluing the teacher education programme; rather it requires that we emphasise the essentials and improve instructional practice to make student teachers take more responsibility for learning.

4. Our analysis of teaching loads in the Colleges suggests that some colleges may not be utilising instructional time efficiently and that there are opportunities to improve the quantity and quality of contact between college tutors and trainees, especially if student teachers take more responsibility for their own professional development. If an “In-In-Out” system results in timetabling decisions that increase teaching group size by 50% in the Colleges (as a result of having only two year groups rather than three) quality will not improve and lecturers contact time will fall. There is also evidence that the predominantly transmission mode of training, the extensive and time consuming assessment system and the extent of peripheral extra-curricular activities in the training colleges may be factors that undermine the quality of the “in-in” training (see, Akyeampong et. al., 2000).

At current levels of cost and efficiency the goals of FCUBE will certainly be undermined unless we rethink seriously teacher education in terms of cost, financing and quality. In conclusion the argument of this report is that a range of alternatives and ways of conceptualising teacher education in Ghana are needed which are informed by issues relating to cost and efficiency. It would appear that the “In-In-Out” programme can be a step in the right direction. However, our analysis shows it does not necessarily mean this will improve quality at reasonable costs; it depends how it is implemented. Our evidence suggests that the “In-In-Out” is insufficient to meet targets of achieving 100% GER, which themselves represent a conservative interpretation of FCUBE. Other more radical strategies may need to be considered, or the rate at which goals are achieved may have to be rescheduled.

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