

Exploring the Mismatch Between Teacher Demand-Supply in Sub-Sahara Africa: Ghana as Case Study

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Abstract

This study presents an analysis of the factors affecting the supply and demand of school teachers in Ghana. The findings suggest that the major pull causing the mismatch in teacher supply-demand equation can be summed up under: a) economic demand, b) demographic factors and c) market forces. Sixty percent of those sampled constituting 162 of the respondents were of the view that there was a significant correlation between remuneration and supply while the other 40% (108) not attributing it to remuneration per se, nevertheless saw a link between supply and other economic issues such as end of service benefit. Ninety five percent of respondents were of the view that teacher upgrading in higher market premium courses in institutions of higher learning exacerbate teacher attrition into other better paid jobs: an indication of non-incentives pulling teachers from the teaching profession. The objective of the study is to contribute to advocacy on teacher issues, especially increased resources as well as innovative funding for the employment of sufficient number of teachers.

Keywords: Teacher, demand, supply, attrition, remuneration

1. Introduction

The concern for quality education, especially in the developing nations is crucial because of the symbiosis between education and productivity, between education and human capital development and between education and the demands of the labour market (Naidoo, 2006). Any serious discussion on quality education cannot ignore the need to maintain sustainable and efficient teacher training, since at the heart of the education debate is the teacher. It is in this light that national policies are vital especially in the developing nations on such issues as teacher supply and demand, quality of training, funding, and curriculum development (Lewin and Stuart, 2003). This calls not only for sufficient funding, but above all a strong political will to put structures in place to cater for teacher education policies. Most researchers agree that school teachers have a powerful impact on the learning experiences of school students. It is therefore important that quality teaching be facilitated by the availability of appropriately skilled teachers, as well as appropriate supplies of education leaders. High quality school level educational experiences will foster better transitions to work and further education for school students, giving better outcomes for individuals, and from an employer perspective, a more skilled and productive workforce. (http://www.mceecdya.edu.au/verve/_resources/-DAS_teachers-PartsA-d.pdf)

The acute shortage of qualified teachers has been identified as one of the biggest challenges confronting Sub-Sahara Africa in its efforts to realize the Education for all (EFA) by 2015 (www.unesdoc.unesco.org). It is estimated that in Sub-Sahara Africa, 1.6 million new posts and four (4) million additional teachers will be needed if the Universal Primary Education (UPE) is to be achieved. Traditional teacher training colleges cannot keep up with the demand. Teaching is seen as a career in decline with low status and salaries and little opportunity for professional development and career progression. These challenges lead to difficulties with respect to recruiting and retaining adequately trained and motivated teachers (ibid).

These challenges become more critical when seen within the context of the mismatch between teacher demand and supply in Africa south of the Sahara. For example, between 1999 and 2005, it is estimated that children enrolled in pre-primary schools in Sub-Sahara Africa increased by 61%, with the average gross enrolment ratio rising from 10% to 14%. Some countries such as Ghana, Cameroon, Lesotho, Namibia and South Africa, have substantially increased their enrolment ratios while others such as Burundi, Burkina Faso, Chad, the Central African Republic, the Democratic Republic of Congo, the Niger and Uganda having preprimary gross enrolment ratio of less than 5%. The implication is that with the gross enrolment ratio increasing in most countries, the demand for more qualified teachers at the basic level

is likely to go up such that the supply might not commensurate with the demand (<http://unesdoc.unesco.org>). Thus the greatest challenge with respect to teacher supply lies in countries in sub-Saharan Africa. According to estimates, the region will need to raise its current stock of teachers by 68%- from 2.4 to 4.0 million- in less than a decade. For example, by 2015, Chad will need almost four times as many primary teachers and Ethiopia will need to double its stock of primary teachers (UNESCO Institute for Statistics, Montreal, 2006).

In Ghana, for example, in the 1970's and early 1980's, per capita income fell by 23% between 1975 and 1983. The real value of government financing for education fell sharply from 6.4% of GDP in 1976 to 1.4 % in 1983. This resulted in near collapse of the education system (Akyeampong et al 2000). This of course had a negative impact on teacher demand and supply. Many teachers in Ghana migrated to nearby Nigeria with the consequent fall in the students' performance coming far below the standard of education. Improving access to basic education de facto implies the need for a sufficient number of teachers who are trained, have access to upgrading their skills as well as motivated enough to be retained in the teaching service. Given the expansion of schools and the increase in school enrolment coupled with financial constraints of a fragile economy, can nations in Sub-Sahara Africa be able to meet the required number of qualified teachers?

2. Purpose of the Study

The purposes of this study therefore were to:

- 1) identify the inter-related factors that cause the mismatch between teacher supply and demand at the basic level of education in Ghana;
- 2) examine the link between teacher upgrading and attrition in Ghana;
- 3) discuss financial constraints and how these set limit to teacher education, recruitment and retaining of teachers;
- 4) make some projections for teacher stock and outflows;
- 5) identify roles of government and other stakeholders in the recruitment of qualified teachers to meet up with the increasing enrolment of the students;
- 6) to offer some recommendations for policy framework for teacher recruitment, maintaining and retaining of teachers.

3. Statement of Problem

Improving the quality of education requires the recruitment of more and better trained teachers. For example, it is estimated that preprimary pupil/teacher ratios (PTRs) are high in Sub-Sahara Africa, above 31:1 on average in 2005- and it has increased since 1999. We have a situation where either the supply of teachers grew, but not enough to commensurate with the large increase in enrolments such as in countries like Burundi, the Congo and Senegal; or it could also be that it remained stable while enrolment increased as in Benin. The shortage of teachers observed in many countries on the continent south of the Sahara is compounded by a low percentage of trained teachers. The shortage of trained teachers worsened between 1999 and 2005. The significant increase in primary enrolment (by 29 million, or 36%) between 1999 and 2005 translated into a rise of the average primary NER for the region from 57% to 70%. Benin, Ethiopia, Guinea, Lesotho, Madagascar, Mozambique, the United Republic of Tanzania and Zambia saw their primary NERs increase by more than twenty percentage points between 1999 and 2005 (<http://unesdoc.unesco.org>).

In Ghana, it is estimated that basic education alone needs fifteen thousand (15,000) teachers annually to fill vacancies (Anamuah-Mensah and Benneh Margaret, 2006). Meanwhile the thirty-eight (38) public Teacher Training Institutions at any given year supply an average of eight thousand five hundred (8,500). Teacher attrition rate in Ghana, even though it is difficult to estimate the exact figures continues to be on the increase (Mereku, 2000). In a survey jointly conducted by the Ghana National Association of Teachers (GNAT) and the Teachers of Education Workers Union (TEWU) in 2009, ninety percent (90%) of teachers interviewed have plans for further studies and this exacerbates the rate of attrition.

Total projected estimates for funding education in Ghana in 2005 was 6.8 trillion cedis, out of which 57% was Government contribution, 11% from external donors, 22% from the Ghana Education Trust Fund (GET- fund) (MOESS, 2005a:97). Thus financial limitation is also one of the challenges facing education generally and particularly teacher education in Ghana. For example, it is estimated that teacher education in Ghana, receives only 2.4% of the Ministry of Education budget. Thus, notwithstanding the above challenges facing teacher education such as teacher supply falling short of demand, increasing enrolment of schools, financial constraints, higher rate of teacher attrition, etc. not much

study has been conducted to explore the determining factors of these teacher related issues and their consequent impact on quality education in Ghana. It is in the light of this, that this study was undertaken.

4. Research Questions

This survey focused on five major teacher-related issues, namely, teacher demand, teacher supply, teacher attrition, teacher remuneration and teacher education funding. It was carried out in the Ashanti and the Brong Ahafo regions of Ghana. The following five questions guided this research:

1. What are the factors that affect the demand of teachers in Ghana?
2. What are the factors that affect the supply of teachers in Ghana?
3. Are there any significant relationships between teacher remuneration and the teacher supply equation?
4. To what extent does teacher upgrading in higher market value courses in the Universities exacerbate the rate of teacher attrition into other more lucrative professions?
5. Is there a link between teacher education funding and the teacher demand-supply equation?

5. Hypothesis

The underlying assumption in this study is that there are five fundamental determinants that are the push and pull of the mismatch between teacher supply and demand in most countries of Sub-Sahara Africa especially in Ghana. Thus, the imbalance between teacher demand and supply can hardly be understood without reference to these five critical factors. Based on this assumption the research was conducted to test the following hypothesis:

1. There exists a correlation between the present teacher demand in Ghana with the high level of school enrolment, population increase and the historical antecedent of the early post independent development agenda.
2. On the supply side, there is a link between the increase in the duration of teacher education in the Colleges of Education, increase of school enrolment and the increasing awareness of education as the means towards social mobility in developing nations.
3. There are significant relationships between teacher remuneration and teacher supply.
4. There is a connection between teacher-upgrading in higher market value courses in the Universities vis-à-vis the low morale of the teaching profession precipitating teacher attrition.
5. Low Funding for Education is also a determining factor in the teacher-demand supply equation.

6. Some theoretical perspectives on attrition/turnover

Any analysis of teacher demand-supply needs to consider possible workplace and labour market considerations. For example, possible dissatisfaction with the workplace can be a critical pulling factor for teachers to seek alternative opportunities. Thus the more teachers believe there are other alternative opportunities the less willing they might be to address workplace frustrations. Crouch and Perry (2003:496) has identified what they refer to as 'looming' shortage in their analysis of the South African teaching profession in which they attributed this 'looming' shortage to factors such as HIV/AIDS, administrative control of educators training capacity in the 1990's, and lack of interest in the teaching profession in South Africa.

Turnover/attrition is described as the movement of employees out of the organization or any permanent departure beyond organisational boundaries (Croasmun, Hampton & Herrmann, 2002:1; Rohr & Lynch 1995). Various researchers advance theories on employee turnover. Ruhland (2001:3) cites Chapman's theory, which expands on Holland's theory of vocational choice. The theory posits that vocational satisfaction, stability and achievement depend on the congruence between one's personality and work environment. Ruhland (2001:3) also cites Krumbolt's social learning theory of career selection, which propounds that factors like genetic endowment and special abilities, environmental conditions and events, learning experiences and task approach skills explain why individuals change occupations throughout their lives. Ruhland (2001:4) uses these theories to develop a public school teacher retention/attrition model. According to this model, teacher retention and thus attrition is a function of teachers' personal characteristics, educational preparation, initial commitment to teaching, quality of first teaching experience, social and professional integration into teaching and external influences.

Khatri, Budhwar and Fern's study of employee turnover (1999) employs a model that posits three groups of factors influencing employee turnover, namely, demographic, uncontrollable and controllable factors. Demographic factors

include age, gender, education, tenure, income level, managerial and non-managerial positions. Uncontrollable factors are the perceived alternative employment opportunity and job-hopping. Controllable factors include pay, nature of work, supervision, organisational commitment, distributive justice and procedural justice (*cf.* Institute of Management, 1999:55; Special Reports, 1999:1).

Celep (2003) draws from the organisational commitment theory and posits that teachers' levels of commitment are determined by factors such as their belief and acceptance of the school organisation's goals and values, the willingness to exert effort on behalf of the school and a strong desire to keep up membership in the organisation. Lower commitment to the school organisation affects both the effectiveness of the school and causes teachers to be less successful or to leave the profession.

Ingersoll (2001a:26) draws from theories advocating teacher turnover as a function of ageing and increasing student numbers. He postulates that teacher turnover can be understood by examining the school organisational characteristics and conditions. His exposition asserts that improvement in organisational conditions such as salaries, increased support from the school administration, reduction of student discipline problems and enhanced teacher input in decision-making would all contribute to lower rates of teacher turnover. The foregoing theoretical exposition of factors influencing turnover seem to confirm school organisational factors as being critical in teacher turnover. These factors include the teaching job itself, supervision, incentives and rewards, which relate to compensation and recognition, career development, advancement and employment security, poor job performance, which relates to lack of skills, low motivation, bad performance and lack of resources (*cf.* Jackson & Schuler, 2000:280).

7. Possible Selves Theory

Possible selves are dynamic, future-oriented, representations of the self. These self-representations are concerned with both what one hopes to become (i.e., hoped-for possible selves) as well as what one might fear becoming in the future (i.e., feared possible selves). Markus and Nurius (1986) described possible selves as self-knowledge pertaining to "how individuals think about their potential and about their future" (p. 954). Possible selves result from individual actions and beliefs, the social environment, and the interaction between individual and the social environment (Markus & Wurf, 1989). Just as knowledge in an information-processing model is stored in long-term memory and may remain inactive until accessed, so too are self-representations, including possible selves stored, but inactive in long-term memory. When stimuli or cues from environmental or interpersonal contexts are perceived, specific self-representations become active in the working self. As such, possible selves, then, are dynamic in that they are being formed in response to the contingencies of intrapersonal goals and interpersonal influences. They are also "working self-conceptions" that are formed from self-representations related to goals, efficacy and other self-beliefs made salient under specific circumstances and settings (Doug & Chasidy 2007).

8. Research Methodology

8.1 Sample and Design

This study used the purposive sampling design from two hundred and seventy (270) sample from two administrative regions of Ghana: the Ashanti and the Brong Ahafo. One hundred and seventy (170) out of the 270 sample was drawn from the Ashanti region, while the remaining one hundred (100) was sampled from the Brong Ahafo region. In both regions, half of those sampled were both males and females, that is one hundred and thirty-five (135) were males and the remaining one hundred and thirty-five (135) were females. In both two administrative regions, the study was concentrated in the capital, namely, Kumasi and its environs and Sunyani and its neighboring villages in the Ashanti and the Brong Ahafo regions respectively.

Out of the one hundred and seventy (170) interviewed in Kumasi and its environs in the Ashanti region, ninety (90) were teachers, sixty (60) were university lecturers and twenty (20) were in top administration in the Ghana Education Service Secretariat. The one hundred (100) sample drawn from the Brong Ahafo region was in the following distribution: sixty (60) were teachers, twenty (20) were lecturers in the University and Polytechnic and twenty (20) were in the Ghana Education Service administration. Kumasi was chosen for this study in the Ashanti region, because Kumasi is geographically a nodal city: people from North and South, East and West of Ghana converge on this city. This allowed for easy sampling drawing. Besides, the Ashanti region is territorially the third largest of the ten (10) administrative regions in Ghana occupying a total land surface of 24,389 square kilometers or 10.2 per cent of the total land area of Ghana. In terms of population, however, it is the most populated region with a population of 4,780,380, accounting for 19.4 per cent of Ghana's total population (2012 Ghana Census)

The Brong Ahafo Region, formerly a part of the Ashanti Region, was carved out of Ashanti and was created an administrative region in April 1959. It covers an area of 39,557 square kilometres and shares boundaries with the Northern Region to the north, the Ashanti and Western Regions to the south, the Volta Region to the east, the Eastern Region to the southeast and La Cote d'Ivoire to the west. The region lies in the forest zone and is a major cocoa and timber producing area. The northern part of the region lies in the savannah zone and is a major grain- and tuber-producing region. The region has a population of 2,310,983 which constitutes 9.4% of Ghana's population figure. Enumeration covered all the 17,546 localities in the region (ibid).

When permissions were obtained, the two hundred and seventy (270) respondents were given a survey pack which contained a consent form and a questionnaire. The researcher with the help of a research assistant personally delivered and collected the self-administered questionnaires from the respondents; thus gaining good cooperation and number of completed questionnaires returned.

8.2 Procedure and Measures

The questionnaires were divided into different sections. These sections sought to measure the different study variables. They were as follows: a) *personal data of respondents*. Respondents were asked to report information on their age, ethnicity, level of education, marital status, monthly income, occupation and number of children; b) *respondents perception of inter-relating factors influencing teacher demand and supply*. Here the focus was on finding out what respondents perceive as constituting the determining factors that affect teacher demand and supply equation in Ghana; c) the view of respondents as to whether or not there is significant *relationship between teacher remuneration and supply*; d) whether there is a link between *teacher upgrading and attrition*; e) *low education funding as a determining factor of the teacher demand-supply equation*.

8.3 Instrumentation

Two instruments were used to gather the data: questionnaire titled 'exploring the link between teacher demand and supply' and records obtained from the planning, research and statistics departments of the Ashanti and Brong Ahafo Directorates of the Ghana Education Service. Method used in data analysis was the descriptive, inferential statistics, using simple percentage, and mean to analyze research questions. There was a total of eight items in the measure using Likert's 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

9. Results

9.1 Demographic Profile

There were 270 (two hundred and seventy) respondents. Two hundred and ten (210) of the respondents constituting 78% of the total respondents were professionally trained teachers. Out of this two hundred and ten (210) professional teachers, one hundred and fifty (150) that is about 71% have taught for over ten (10) years. Sixty (60) of the 210 constituting 29 % have taught between 5-10 years. Thirty-eight percent (38%) of the 210 professional teachers constituting eighty (80) teachers possessed the Masters degree in respective areas of specialization, while thirty-three percent (33%) that is seventy (70) possessed the Bachelors degree in Education and the remaining 60 constituting 29% had the Diploma in Education. The remaining sixty (60) of the total two hundred and seventy (270) respondents that is 22% were untrained teachers. Twenty (20) out of this sixty (60) which constituted 33% had bachelor's degree, 7% had Masters and 60% had no degrees. The mean age of professional teacher respondents is 46 for those with Masters Degree and 32 for those with Bachelors degree. The mean average age of the non-professional respondents with Masters Degree was 46 years, bachelors 32, and no degree 20 years and had studied for a minimum of 6 years after primary education

Demographic Profiles of respondents

a) Professional and non-profession teachers interviewed:

Profiles of respondents	No of Respondents	Percentage
Professional teachers	210	78%
Non-professional teachers	60	22%
Total	270	100%

Source: field work, 2012

b) Professional and years of teaching:

Years of teaching	No. of Respondents	Percentage
10 years and above	150	71%
Between 5-10 years	60	29%
Total	210	100%

Source: field work, 2012

c) Professionals and Qualifications:

Qualifications	No. of Respondents	Percentage
Masters degree	80	38%
Bachelors	70	33%
Diplomas in Education	60	29 %
Total	210	100%

Source: field work, 2012

d) Non Professionals

Qualifications	No of Respondents	Percentage
Masters degree	4	7%
Bachelors degree	20	33%
No Degree	36	60%
Total	60	100 %

Source: field work, 2012

Mean Age and level of Education of respondents

e) Professional

Qualifications	Mean Age
Masters Degree	46
Bachelors degree	32

Source: field work, 2012

f) Non-professional

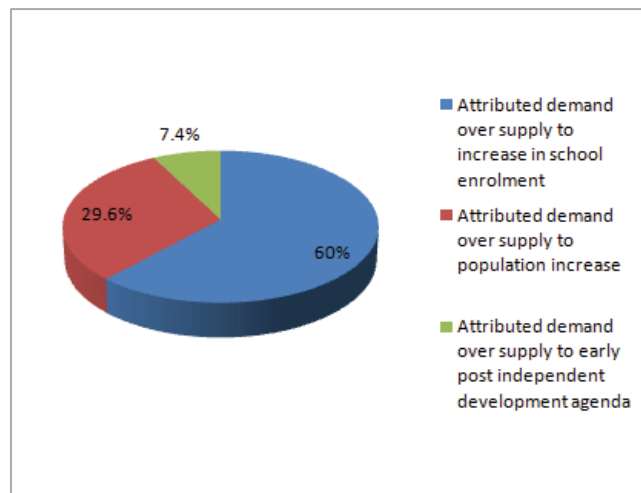
Qualifications	Mean Age
Masters Degree	46
Bachelors degree	32

Source: field work, 2012

9.2. Factors affecting the demand of teachers in Ghana

Under this section, three main variables were investigated, namely: a) the high level of school enrollment and its impact of teacher demand-supply, b) the increase in population since the 1980's and c) the early post independence development agenda. One hundred and sixty two (162) constituting 60% of the respondents attributed the main cause of the demand for teachers that is over and above the supply to the increase in school enrollment especially the millennium agenda of education for all by the 2015. Eighty respondents (29.6%) felt that teacher demand in excess of supply was the result of the population increase which is not unrelated to the increasing demand of school enrolment, while the remaining twenty respondents (7.4%) attributed the increase in demand to the early post independence developmental agenda in the 1960's which sought to recruit as many untrained people as possible into the teaching field to make up for the shortage. This, they felt paved the way for the imbalance in teacher demand and supply. Thus, the large influx of untrained personnel into the field gave the rather false impression that demand if at all was more or less at parity with supply. It is when the untrained (which still constitute a large percentage of teacher supply) are taken off, only then can we get the clear picture of the extent of the mismatch between teacher demand and supply in Ghana.

Results of factors affecting the demand of teachers in Ghana

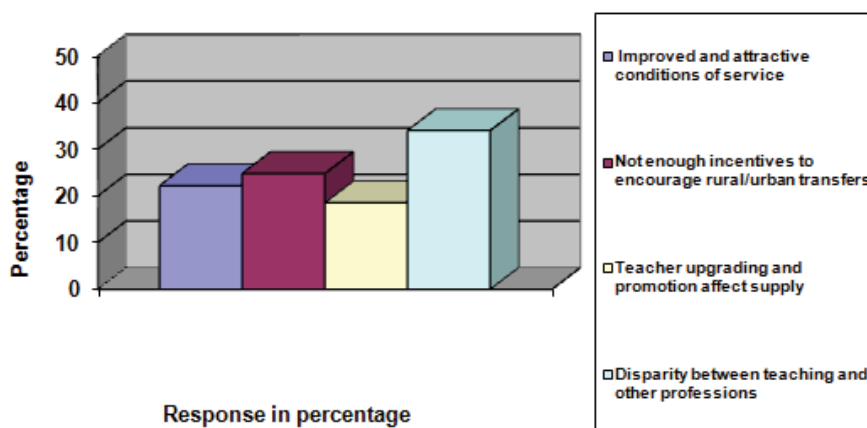


Source: fieldwork 2012

9.3 Factors that affect the supply of teachers in Ghana

Four variables that were perceived to affect teacher supply issues were examined under this section. They were: a) improved and attractive conditions of service, b) incentives to encourage rural/urban transfers, c) teacher upgrading and promotion and d) disparity between teaching and other professions. Sixty (60) respondents representing 22.2% were of the opinion that improved and attractive conditions of service were vital determining factors affecting the supply of teachers. The general perception that most people in Ghana and other parts of sub-Sahara Africa had about the teaching profession was that it was very poorly rewarded with the least attractive benefits that would entice the younger generation. Sixty seven (67) respondents constituting 24.8% reported that there were not enough incentives to encourage rural/urban transfers. This incentive is perceived to be crucial in view of the fact that school enrollment keeps increasing across the length and breadth of Ghana due to population increase. Regarding teacher upgrading and promotion as a factor of teacher supply, fifty respondents, which comprised 18.5% perceived the issue of teacher upgrading and promotion as a critical factor determining the supply side of the teacher demand-supply equation. These respondents were of the view that when teaching is matched with the other professions such as in the financial institutions, the manufacturing sector, and in the medical professions, the upgrading and promotion of the teacher is far below expectation. The variable on disparity between teaching and other professions received the highest ranking in the survey under this section. Ninety three (93) of the respondents comprising 34% of the sample were of the view that the disparity in terms of remuneration and other end of service benefits between teaching and other high market value professions constitute the number one cause of the supply side of the equation being less than the demand. This same reason was advanced by the fifty (50) respondents on the teacher upgrading and promotion variable as the cause of the imbalance between demand and supply.

Factors influencing the supply of teachers in Ghana

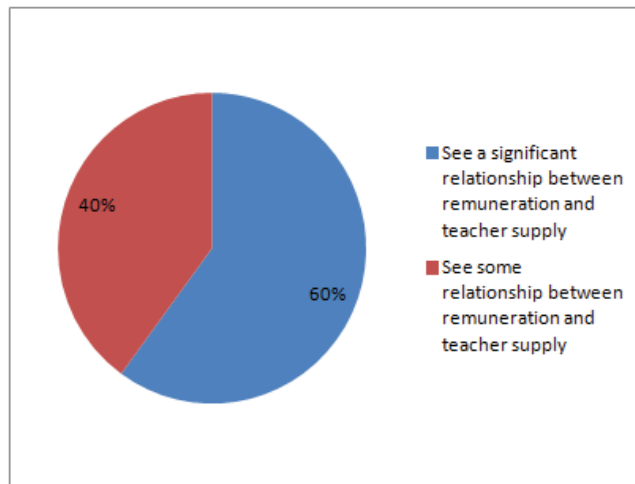


Source: fieldwork 2012

9.4 Significant relationships between teacher remuneration and the teacher supply equation

One hundred and sixty two (that is 60%) of those sampled for this survey were of the perception that indeed that was a significant relationship between teacher remuneration and the teacher supply equation. This according to this group of respondents was based on the attrition rate of those who leave the teaching profession after upgrading in the universities and fail to come back to the teaching profession. The remaining 40 %, constituting one hundred and eight respondents felt that there was certainly some relationship between the two variables: remuneration and supply. This notwithstanding the relationship between the two was not that mechanical. They were of the opinion that considerable number of teachers loves their work not simply because of the financial benefits as just a little modicum of better conditions of service such as a better end of service benefits that would help teachers have pleasant retirement.

Relationships between teacher remuneration and teacher supply

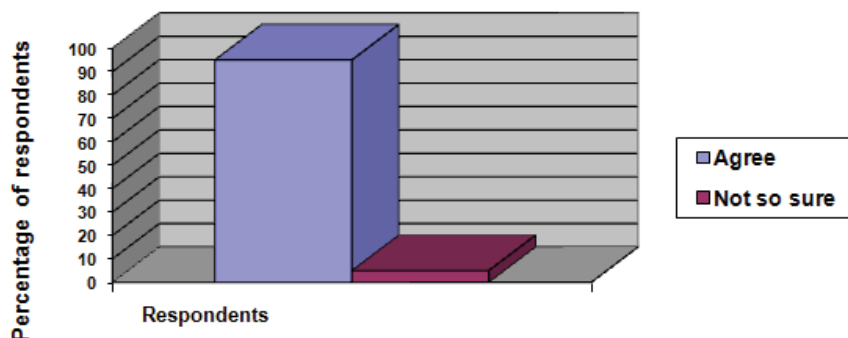


Source: fieldwork 2012

9.5 To what extent does teacher upgrading in higher market value courses in the Universities exacerbate the rate of teacher attrition into other more lucrative professions?

This part of this research focused on examining the link between the following variables in the teacher demand and supply issue: upgrading in higher market value courses in the institutions of higher learning such as the natural sciences, biology, chemistry and physics and the business-related disciplines such as accounting, financial management, etc. Ninety five percent (95%) constituting about 256 agreed that there was a link. Indeed upgrading in higher market premium courses in the natural sciences and the business oriented courses precipitates teacher attrition into better paid jobs. After training in these better-paid courses, a considerable number of teachers fail to return to the classrooms. In many instances, those who come back to the classroom are mainly those in the arts and the humanities. This is because the industries and the financial institutions appear to offer better remuneration and better end of service benefits. The remaining five percent (5%), that is 14 of the respondents were not so sure to whether or not teacher attrition was related to higher market premium courses.

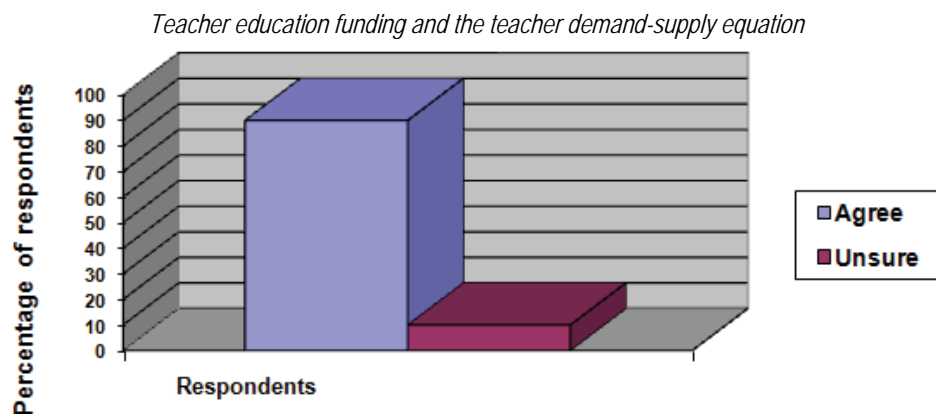
Upgrading in market value courses and attrition



Source: fieldwork 2012

9.6 Is there a link between teacher education funding and the teacher demand-supply equation?

There does not seem to be any clear cut policy on teacher education funding in most countries in Africa including Ghana. Over the years, funding seems to be dwindling. This part of the survey was to find out if the perception was indeed real and if it was, to what extent has this contributed to the imbalance between teacher demand and supply? Majority of those interviewed, comprising 243 (90%) of the respondents were of the opinion that indeed teacher education funding keeps fluctuating in Ghana over the years. Indeed the contention among these 243 respondents was that teacher education funding in Ghana at any point in time was contingent upon the viability of the economy and external donor funding. This comes out clearly during the early and mid eighties when Ghana's economy was in shambles. The poor economy affected not only the quality of teacher supply but also the number of the supply to meet the required teaching labour force. Out of this number who responded that teacher education funding was related to the supply, included all those respondents who were holding top administrative position in the Ghana Education Service. Over, all, only a tiny minority of 27 respondents (10%) were not quite sure that the two variables were related.



Source: fieldwork 2012

10. Discussion

The findings of this research suggest that teacher demand-supply in Ghana is contingent upon and sensitive to three crucial interrelated factors: economic demand, demographic factors and market forces. For example, studies conducted in the US have demonstrated that higher salaries are associated with lower teacher attrition. A longitudinal study by Murnane & Olsen (1989) suggested that a significant pay rise for teachers (relative to local pay scales) was correlated with an increase of more than four years in the median teaching spell duration. (Guarino et al 2004, Murnane & Olsen, 1989 and 1990).

In Sub-Sahara Africa however, the reverse happened in some countries. With the expansion of access to education in these low income countries, teachers' salaries have often fallen in real terms. It is estimated that between 1985 and 2000, teacher salaries in Africa fell from 6.3 times GDP per capita to 4.4 GDP per capita (Lambert 2004). Despite these falls, however, teacher salaries remain higher than global averages when expressed as a multiple of GDP per capita. The average primary education teacher salary (ratio per capita between 1975-to 2000) in African countries with GDP below 2000US dollars fell as follows: 8.6 in 1975, 6.3 in 1983, 6.0 in 1992 and 4.4 in 2000. Between English speaking, French speaking and Sahel countries in Africa, the hardest hit were the latter followed by the French speaking countries with the Anglophones doing a little bit better. In Ghana, for example, it fell by 2.7 in 1970, 0.9 in 1980, 1.3 in 1990 and 3.6 in 2000 (going by the 1998 figures) (ibid). Thus, if these data are anything to go by, they do indicate that levels of remuneration perceived to be low can result in hidden attrition, as teachers leave their posts to engage in additional income generating activities. In Malawi for example, it is reported that teachers are often reluctant to leave their positions formally if employment opportunities are scarce, but that when salaries are low and sometimes late, teachers may seek other ways of supplementing their income, and this can contribute to absenteeism (Kadzamera 2006). A Presidential Commission of Inquiry, setup in Malawi to investigate the reasons behind the poor examination performance of students at MSCE, found increasing levels of absenteeism and indiscipline among teachers (Presidential Commission of Inquiry 2000). Students interviewed during their inquiry also reported that most of their teachers were engaged in moonlighting activities in order to generate extra income (Kadzamera 2006).

Thus, as per the findings of this research, supported by other research work there appears to be significant relationships between teacher remuneration and the teacher supply equation. Sixty percent (60%) constituting one hundred and sixty two (162) of those who participated in the study were of the view that the supply of teacher cannot be divorced from the economic dimension, specifically on remuneration, while the other 40% (one hundred and eight) while not attributing it to remuneration per se, nonetheless saw that there was some connection between teacher supply and other economic issues such as conditions of service and end of service benefits. This finding also gives some support to the Ghana experience in the early and mid 1980's, when the economy was in shambles, teacher supply fell sharply and many Ghanaian teachers left for neighboring African countries for greener pastures. Thus the relative pay of teachers as well as the relative pay progression in the teacher labour market condition can be a pull factor for teachers either to leave for alternative employment or chose to remain but find ways to supplement their meager income resulting in absenteeism and poor student performance (as in the case of report from Malawi). This gives some strength to confirm our hypothesis that teacher remuneration is significantly related to the supply equation. The more teachers feel motivated in terms of salaries, the less likely it is that they would leave into other better paid jobs.

The influence of the market forces does affect the supply of teachers. In a study conducted in Ghana in 2009, the analysis shows that the majority (90%) of respondents intended to further their education. This is an indication that most teachers want to acquire higher knowledge which may have positive effects on the quality of education. However, it may also be an indication of the rate at which teachers want to leave the classroom (even if for a short period). Thus, most teachers want to pursue higher education in the universities either for bachelor's degree or for a higher qualification. This implies that teachers who pursue further education on full time basis are likely to stay out of the classroom for between two and five years depending on the course of study (Gnat & Tewu, 2009). Sixty four percent (64%, representing a frequency of 502) in this Gnat & Tewu survey said they wanted to come back to the classroom and the teaching profession if adequately remunerated, while 35 % (frequency of 275) said they would not come back. Some of these who obtain higher qualifications in better remunerated jobs fail to come back to the classroom. In this 2009 Ghanaian survey the respondents who do not intend to return to the teaching profession after further education were asked to indicate what sector they intend to move to. The results show that about 60% of them would want to take a job either in the finance sector or in the community, social and personal sectors. The remaining 40% are distributed fairly across the other major economic sectors as agriculture, mining, manufacturing etc.

This implies that the market forces especially with respect to better paid opportunities in the market do affect negatively the demand and supply of teachers. It is likely that after upgrading in higher studies at the universities some fail to come back. This finding from this 2009 Ghana survey gives some plausibility to this research findings in which 60% and 40% attributed the teacher demand-supply to both remuneration and better conditions of service and end of service benefits respectively. Besides when one examines the combined results of respondents in our research on the variable factors affecting the supply of teachers, one can see that the scores are evenly distributed among respondents: 22.2% were of the view that improved and attractive conditions of service, 24.8% said there was not enough incentives to encourage rural/urban transfers, while 18.5% saw teacher upgrading and promotion and 34 % were of the view of other economic matters. This underscores the fact that disparity in terms of remuneration, and other conditions of service between teaching and other professions is a major cause of the pull affecting both the demand and supply.

Global available data suggest that there is often high attrition of teachers in the early years of their careers (Bobbitt et al., 1994; Boe et al.; Stinebrickner, 1998, 1999, 2001; Theobald, 1990, Quartz 2008). A study in Texas (Kirby et al 1999) characterized this as a U-shaped pattern of attrition with high attrition in the early years, followed by lower attrition of mid-career teachers, and rising attrition in late career as teachers approach retirement age. They found that the attrition rate of young teachers was about 11-13%; for those aged 40-54, the attrition rate was only 5% and for those aged 55 and older attrition rose sharply because of retirement. Similar patterns of high attrition in the early years have been found for the US as a whole, with 11% of teachers leaving after the first year, but only 6% leaving after the fifth year.

Thus these data confirm one of the hypotheses of this research finding, namely that there is a connection between teacher-upgrading in higher market value courses in the Universities vis-à-vis the low morale of the teaching profession precipitating teacher attrition. The fact that globally, there appears to be a u-shaped pattern of teacher attrition, that is, in the early years, attrition is high, in the middle years it goes down and getting to retiring age it shoots up again, is a pointer to the fact that new teachers entering the field are not oblivious of the attractiveness of other better paid jobs in the labour market compared to teaching and may decide in the early periods to switch professions before it is late. As teachers grow older and confer with their peers in retirement, they realize the hard fact that retirement benefits are really meager and will not be enough to support them and may decide to opt out. In the Ghana survey mentioned above in 2009, 98 % were not satisfied with their pay: some respondents received as low as GH¢ 74 (\$52) per month while others also received an average monthly salary GH¢ 405 (or approximately \$287 per month in 2009)(Gnat & Tewu, 2009). Teacher retaining and maintaining is therefore contingent upon motivation and job satisfaction. In some countries in sub-Saharan Africa such as

Zambia, 2008 report indicated that attrition of basic education teachers totaled 6,745 out of which 2,191 constituting 32.5% resigned from teaching profession. Twenty four percent (24%) of teachers comprising 1,626 left for other reasons (cf. ITFT, EFA, 2010). Thus all these give some plausibility to the findings of this research, namely that teacher attrition even though difficult to have exact estimates is nevertheless a factor to the mismatch between teacher demand and supply in sub-Saharan Africa.

11. Conclusion

At the beginning of the millennium, the World Education Forum defined the Education for all (EFA) agenda. Six core areas were identified, namely, a) early childhood care and education, b) primary education, c) youth and adult learning needs, d) literacy, e) gender equality and f) quality education. In addition to these core areas three main goals were set for 2015: a) to reduce global illiteracy by 50%, b) ensuring universal primary education and c) gender equality. All these could hardly be realized without adequate numbers and quality of teachers. Thus the precondition to the achievement of these goals is contingent upon a large number of qualified trained teachers who have job satisfaction and fulfillment, adequately remunerated to dedicate themselves to teaching. With only three years from 2015, this study and other research findings seem to suggest that there are still gaps in the provision of teachers in Ghana and other sub-Saharan Africa. In Ghana alone, it is estimated that it will need about fifteen thousand (15,000) teachers annually to fill vacancies (Anamuah-Mensah and Benneh Margaret, 2006). Approximately one million (1,000,000) teachers have to be replaced in Africa every year to balance out the attrition of teachers (cf. Projection figures from 2007 (source: UIS). Not many nations in Sub-Saharan Africa are economically in a position to raise this number of qualified teachers. This de facto puts such nations at risk to achieving the millennium goals. This calls for national, continental and a global policy framework based on findings of research work to help nations at risk to come out with clear-cut comprehensive national teacher policies on teacher recruitment, retaining and maintaining. This will call for the following:

- a) advocacy on teacher issues, especially increased resources as well as innovative funding for the employment of sufficient number of teachers;
- b) strengthening geographic partnerships such as north-south and south-south that will aim at filling the teacher demand-supply imbalance;
- c) responding to poor countries request for support to address the teacher demand and supply mismatch;
- d) supporting the development of national strategies and plans to rectify the teacher gap in Sub-Saharan Africa regarding data, policy making, policy implementation and evaluation.

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