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GENDER DIFFERENTIALS IN THE ADMISSION, PROGRESSION AND GRADUATION OF STUDENTS IN THE HND STATISTICS PROGRAM: A CASE STUDY OF ACCRA POLYTECHNIC

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Abstract

All over the world, education of the girl child has been of primary concern in the past two decades. Females are particularly encouraged to pursue educational programs which eventually lead to careers in so called male dominated fields of science and engineering. According to a UNESCO Institute for Statistics report, the international community pledged to eliminate gender disparities at all levels of education by 2015 as part of the Millennium Development Goals. The question one may ask is the extent to which this particular MDG has been achieved. Educational institutions like the Technical and Vocational training centres have a major role to play in achieving this goal. Polytechnics offer a wide variety of programs with the objective of giving its students practical oriented training to provide manpower, largely, for the middle level. Accra Polytechnic runs at least five programs each in the fields of Science and Engineering. This paper looks at the differentials in gender in the enrolment, progression and completion of students in the HND Statistics program in Accra Polytechnic, since the inception of the program about two decades ago. The use of educational statistical measures clearly shows the academic prowess of the female HND Statistics student, despite the disparity in enrolment. With a scholastic acceleration rate of 0.83 for females in their final year and a cumulative grade attainment rate of 0.97 for females in the 20-25 years age bracket, it is gratifying to note that females in the HND Statistics Program are making inroads in a perceived male dominated field.

Keywords: MDG, Statistics, Differentials, Scholastic, Attainment.

1.0 Introduction

1.1 The Concept of Education

Education is defined in several ways by different authors, each of which stresses on the acquisition of knowledge to develop oneself. It is seen as the act of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and generally of preparing oneself or others intellect for a mature life. It is a matter of fact that education begins from the day one is born through to the end of the individual's life. Arguably the best form of education is to have hands-on experience and not just studying theory in books. This form of education has metamorphosed into the now popular Competency Based Training, which is provided by Technical and Vocational institutions.

1.2 Female Education in Africa

Education for women in Africa has faced a hard time with a history of conservative customs, the elitist residual heritage of colonialism and tribal cultures that have contributed to the marginalization of females in higher education and education planning (Anzia, 2007; Mama, 2003). International organizations have made various attempts to numerically capture and quantitatively research gender inequity in Africa higher education using a combination of different measures. The reality, however, is that this information is not consistently available even within the UN system and at best policy makers rely on estimation procedures characterized by irregular national census data collection.

This applied research study is premised on the notion that for African tertiary institutions to effectively maximize their engagement with a full diversity of external stakeholders and to sustainably contribute to the continent's development there is the need to understand the socially constructed relationships between men and women within the higher education sector.

The underlying purpose of this study is to investigate the internal state of gender equity within Accra Polytechnic with regards to the HND Statistics program.

1.3 The Millennium Development Goals 2&3

Global inequity between the education of men and women has been internationally recognized as a human rights and development challenge for several years. The recognition has been manifested through several international accords (Ramsey, 2013). Most notably, the international community met at the Millennium Summit of the United Nations in 2000 to adopt the United Nations Millennium Declaration in September 2000 and subsequently the eight Millennium Development Goals (MDGs).

MDG 2 specifically targets basic education by committing member states to "achieve universal primary education" by 2015, whereas MDG 3 commits member states to "promote gender equality and empower women". Despite reports of progress towards Goals 2 and 3 in terms of primary and secondary education in developing countries, global progress is not being realized in tertiary education – particularly in Sub-Saharan Africa as seen in the region's worsening Gender Parity Index for gross enrolment in tertiary education between 1999 and 2010, (Ramsey, 2013).

1.4 Ghana's Progress towards Achieving MDG 3

The MDGs come from the Millennium Declaration, signed by 189 countries, including 147 heads of State and Government, in September 2000. Building on the UN global conferences of the 1990s, the UN Millennium Declaration of 2000 marked a strong commitment to gender equality, among others. Goal 3 is to promote gender equality and empower women. The target is to eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015. According to a July, 2013 GSS publication on the MDGs in Ghana, there are three indicators to measure the success or otherwise of this goal, (Millennium Development Goals in Ghana. 2010 Population and Housing Census Report. Ghana Statistical Service, July 2013). The indicator of interest here is the ratios of girls to boys in primary, secondary and tertiary education.

This indicator measures the equality of opportunity, fairness and efficiency of education, measured as a ratio of the number of enroled girls to enroled boys in primary, secondary and tertiary education (also known as the gender parity index), regardless of ages. It is widely acknowledged that eliminating gender disparity at all levels of education would help to increase the status and capabilities of women and reduce feminization of poverty (GSGDA, 2010). Female education is also an important determinant of economic development. The emphasis on girls is because girls are more likely than boys to suffer from limited access to education, especially in rural areas and/or where families have to make difficult choices in situations of limited resources or low income. The situation is even worse at higher levels of education as it is well acknowledged that in most developing countries girls potentially face additional hurdles in accessing and remaining within the educational ladder, particularly in the later grades as daughters assume additional burdens within the home and are more susceptible to harassment from male pupils/students and teachers as well as forced early marriage.

2.0 Methodology

The study looked at female access to tertiary education nationwide, but focused on female admission, progression and graduation of students in the HND Statistics program at Accra Polytechnic. On the national front, secondary data obtained from the 2010 PHC report was analyzed with regards to gender differentials at the tertiary level by region and locality. The MDG report of the Ghana Statistical Service published in July, 2013 was also utilized in this study. Internally, secondary data on enrolment into the Polytechnic with focus on the School of Applied Science and Art and specifically the Statistics department from the 1995/96 academic year to the current 2014/15 academic year was obtained. These data were picked for the computations of the educational measures.

Education is an important variable in accounting for demographic behavior. In this study three broad categories of educational measures are considered. These are measures of educational input, progression and output. The measures of educational input are concerned with actual enrolment in school or in any grade or level of school, with types of school and fields of study and with enrolment expectations. Specifically, the study looks at enrolment at the first year in Accra Polytechnic in the field of Statistics. Measures of educational progression have to do with retention in school from one grade or age to another with graduation and with grade standing relative to age. For this study, retention in the program from one level to another with graduation at the third year, or maximum five years is used. Finally, measures of educational output relate to eventual educational status, such as literacy, educational attainment and educational qualifications.

3.0 Findings

3.1 Ratio of females to males in tertiary education by locality

A comparison of Gender Parity Index in urban and rural localities shows that it is lower at all levels of education in rural localities ranging from 0.9 in primary, 0.78 in secondary and 0.6 at tertiary levels as against 1.01, 0.97 and 0.73 respectively in urban areas. Figure 3.1 shows the ratio of females to males for only tertiary education comparing urban to rural localities. The GPI is greater for the urban locality, where assess to tertiary education is higher.

3.2 Ratio of females to males in tertiary education by region

Although the variations at the regional level are generally small, the Greater Accra region has a GPI at tertiary of 0.84, whereas the Northern region has the lowest GPI at all levels with tertiary being 0.47. This is shown in Table 3.1

A comparison with the 2000 PHC results suggests that all the regions saw an increase in tertiary enrolments. Greater Accra and Volta regions recorded the highest increase in GPIs of 21% and 20% respectively at the tertiary level.

3.3 Gender parity in education (2008 – 2011)

The Gender Parity Index (GPI), according to the 2010 PHC data, reduces as one move higher on the educational ladder. GPI at the primary level is 0.95, which means for every 100 boys in school there are 95 girls while secondary school and tertiary level are 0.88 and 0.71 respectively. Trend analysis shows that the GPI has reduced by one percentage point when compared with the 2000 PHC data, indicating slow progress towards achieving the MDG target of 1.00 GPI. However, substantial progress has been made at the tertiary level where the GPI has increased from 0.58 in 2000 to 0.71 in 2010. This increase may indicate the beginning of a positive trend in increased enrolment of female students compared with male students at the tertiary level, and thus a positive development for the country's quest for equitable and universal education for all.

Table 3.2 shows trends in GPI since 2009 computed with data from the Ministry of Education as contained in the GSS MDG report. The GPI obtained from the institutional data depicts a wide disparity of female enrolment at the tertiary level. The limited progress in GPI in recent years suggests that if parity is to be achieved, a concerted and targeted strategy is required to close the gap in access at all levels.

3.4 Measures of Educational Input

The data on enrolment from the 1995/96 academic year to the current 2014/15 academic year was obtained and averaged over the twenty year duration. Table 3.3 shows the summary of the average enrolment. According to Shryock et al (1980), the educational measures of Input, Progression and Attainment include the following. The authors have adapted these measures for the computations that follow.

(i) Crude Enrolment Rate, which is the ratio of the total enrolment into the school of Applied Science and Art to the total enrolment of all first year students in the institution. This gives a value of 15.9%.
(ii) General Enrolment Rate, which is the ratio of the total enrolment into the school of Applied Science and Art to the total enrolment of all first year HND students. This was computed as 18.6%.
(iii) Program-Specific Enrolment Rate, which is the ratio of the enrolment into a program to the enrolment into the school of Applied Science and Art. This was found for four programs of study within the school. The fifth program is a recent addition; hence no data was obtained for the twenty year duration. The PSER values for Statistics, Science Laboratory Technology, Fashion and Institutional Management are respectively 7.1%, 54.0%, 19% and 19.9%.
(iv) Gender-Specific Enrolment Rate, which is the ratio of enrolment by gender into the four programs to enrolment into the school of Applied Science and Art. For males, the value is 41.2% and for females it is 58.8%.
(v) Gender-Program-Specific Enrolment Rate, which is the ratio of enrolment into a program by gender to the enrolment into the school of Applied Science and Art. This gives 5.7% for males in the HND Statistics program and 1.4% for females.

3.5 Measures of Educational Progression

Data on educational progression provide a basis for seeing to what extent population groups persist in school and to what extent continuation in school is related to normal grade progression. Of major concerns are the concepts of school retention and dropout and also scholastic retardation and acceleration. School retention refers to the

continuation of person's enroled in school from one school grade or level to another. The data on enrolment from the 1995/96 academic year to the current 2014/15 academic year was segmented into some age groups and levels, by gender. Table 3.4 shows the average enrolment by age and level for females in the Statistics program. Based on this data, the following educational measures of progression have been computed.

(i) Program Retention Rate for females in the Statistics program is 93%, which compares favorably with the institution's target of 96% by the year 2018, as contained in Accra Polytechnic's Strategic Plan (2013 – 2018).
(ii) Assuming ages 20 and 21 are normal for HND I, the Scholastic Acceleration Rate for females in HND Statistics I is computed as 19.6%
(iii) Assuming ages 21 and 22 are normal for HND II, the Scholastic Acceleration Rate for females in HND Statistics II is computed as 44.8%
(iv) Assuming age 22+ is normal for HND III, the Scholastic Acceleration Rate for females in HND Statistics III is computed as 83%
(v) In like manner, following the assumptions above, the Scholastic Retardation Rate for females in HND Statistics I and II are respectively 28.4% and 10.9%

3.6 Measures of Educational Output

Educational attainment is the highest grade completed within the most advanced level attended in the educational system of the country where the education was received. Of the 199 females in HND Statistics III, only six of them could not complete within the three years of study. The measures of educational output include:

(i) Specific Grade Attainment Rate for HND Statistics III females aged up to 22 years is computed as 0.83.
(ii) Cumulative Grade Attainment Rate for females in their final year is 0.97.
(iii) Educational Attainment Ratio relating HND Statistics females to those not attaining the certificate at all is also 0.98.

4.0 Discussions and Conclusions

Over the last two decades, women empowerment and gender mainstreaming into socio-economic development of the country has received enormous attention. However, significant challenges still remain for women's participation in access to education particularly at the tertiary level. It is however better in urban areas than in the rural areas. In Ghana most of our TVET institutions are urban based. On regional basis, the Greater Accra and Volta regions recorded the highest increase in GPIs of 21% and 20% respectively at the tertiary level, over the ten year period. It is worthy of notice that female enrolment into Polytechnics in Ghana has been increasing, albeit slowly. The target of 40% by 2015 could be reached if effort is made to sensitize them at the Senior High School level. Comparatively, female enrolment in TVET institutions is higher than the Polytechnics. Though the target of 50% by 2015 is yet to be reached, it is refreshing to note that females really do patronize these TVET institutions, which offer competency based training in their programs.

A Crude Enrolment Rate of 16% shows that students are more inclined to other areas of study than in the sciences. A Program-Specific Enrolment Rate of 7% for Statistics also depicts the low patronage of the program. Within the school of Applied Science & Art, a Gender-Specific Enrolment Rate of 59% shows there are more females in this faculty than males. This is because several females opt for Fashion Design as well as Hotel, Catering and Institutional Management (HCIM) programs. A value of 1.4% in the Gender-Program-Specific Enrolment Rate for females in the Statistics program reflects the rather low enrolment into a so called male dominated field.

On educational progression, a retention rate of 93% for females reading Statistics compares very well with the target of 96% for the institution by the year 2018. Indeed, almost every female admitted into the program remains until completion. Scholastic retardation and scholastic acceleration are defined in terms of the relationship between an enrollee's age and the grade in which he is enroled. These measures assume that a person enroled in school advances one grade each year. Scholastic retardation and acceleration measure the relative amount of progress in school grade advancement. Based on the assumptions, the scholastic acceleration rates increase from one level to another. Admittedly, these rates solely depend on the assumptions made for an enrollee's age and level. However, an 83% scholastic acceleration rate for females in the final year of their HND Statistics program, means these females exits into the real world of work in their primes.

Educational attainment is the highest grade completed within the most advanced level attended in the educational system of the country where the education was received. It is measured not by the number of years, which a person has spent in school, but by the highest grade, which he was able to complete. With a Specific Grade Attainment Rate of 83% for females in their final year for age 22 and below, it confirms the fact that these females earn their certificate at an early age. 97% of all females who enroll on the HND Statistics program attain their ultimate goal. This is expressed in the Cumulative Grade Attainment Rate.

From the above discussions, it is evident that indeed there are gender differentials in the enrolment of students into the HND Statistics program in Accra Polytechnic, nevertheless, the few females who enroll progresses very positively and attain their diplomas even at an early age. It is therefore not surprising that the current and the immediate past Government Statisticians of the Republic of Ghana are both females with doctorate degrees. The current Head of Statistics Department of the Polytechnic is also a female with a doctorate degree. Females really excel when they venture into so called male dominated fields of academic pursuit.

5.0 Acknowledgement

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4. Department of Mathematics and Statistics, Accra Polytechnic,

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APPENDIX

Figure 3.1: Ratio of females to males in tertiary education by locality

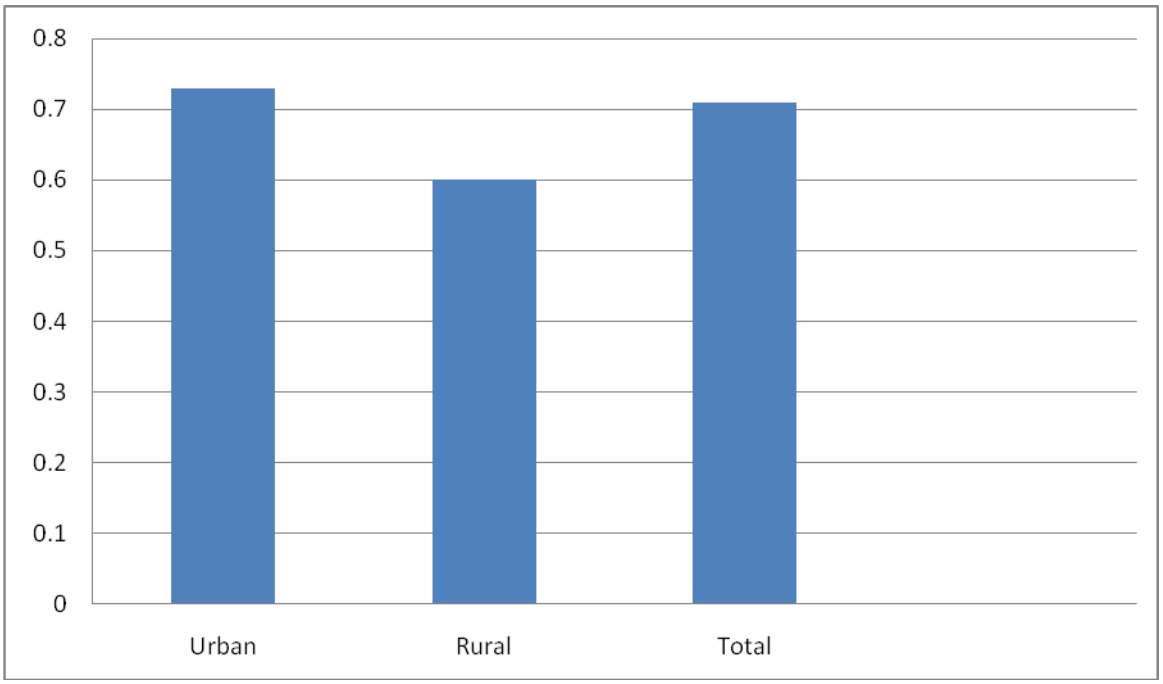

Table 3.1: Ratio of females to males in tertiary education by region

Region	2000	2010	Percentage Progress
Western	0.64	0.71	10.9
Central	0.65	0.67	3.1
Greater Accra	0.63	0.84	33.3
Volta	0.49	0.69	40.8
Eastern	0.59	0.75	27.1
Ashanti	0.66	0.69	4.5
Brong Ahafo	0.53	0.62	17.0
Northern	0.35	0.47	34.3
Upper East	0.48	0.49	2.1
Upper West	0.49	0.54	10.2

Table 3.2: Gender parity in education (2008 – 2011)

Educational Level/Year	2008/2009 (%)	2009/2010 (%)	2010/2011 (%)	Target (2015) (%)	Progress Towards target
Female enrolment in tertiary level	44.3	44.7	45.4	50	Significant progress
Female enrolment in Public Universities	37.4	32.4	33.3	40	Slow progress
Female enrolment in Polytechnics	29.7	30.2	32	40	Slow progress
Female enrolment in TVET	44.3	44.7	44	50	Stagnated

Table 3.3: Average enrolment (1995/96 – 2014/15)

	Male	Female	Total
All first year students	2,515	2,086	4,601
HND first year students	2,152	1,793	3,945
Applied Science/Art first year students	302	431	733
Statistics students	42	10	52
SLT students	218	178	396
Fashion students	24	115	139
HCIM students	18	128	146

Table 3.4: Average enrolment by age and level for females in the Statistics program (1995/96 – 2014/15)

Age	HND I	HND II	HND III	Total
<19	14	10	6	30
19	26	30	19	75
20	54	50	48	152
21	52	49	46	147
22	34	40	50	124
22+	24	22	30	76
Total	204	201	199	604