

Academic Performance of Female Students Enrolled under Pre-entry Programme at the University of Dar es Salaam

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Abstract

The main objective of this paper was to determine whether there are significant differences in academic performance of female students enrolled under the pre-entry programme and students who were admitted normally in science based courses at the University of Dar es Salaam. Under the pre-entry programme, female students undergo six weeks of remedial training after which they do a pre-entry exam. However, little was known about the academic performance of female students admitted to higher institutions under affirmative action programmes compared to those who met the higher education admission criteria. This was an interesting study and the first of its kind in the literature to evaluate the academic performance of students under affirmative action programmes aimed at narrowing gender gaps in human capacity building in developing countries. The study utilized secondary data collected from the University of Dar es Salaam records. The results showed that the academic performance of female students enrolled under the pre-entry programme was on average lower than for students who were admitted normally. However, female students who were admitted normally outperformed male students counterparts. The findings have practical implications for policy makers interested in bridging gender gaps in human capacity building and identify areas warranting additional research.

Keywords: gender, academic performance, science courses, pre-entry programme, human capacity

INTRODUCTION

The main objective of this paper is to determine whether there are significant differences in academic performance of female students enrolled under the pre-entry programme and students who met the minimum cut off point for admission into science based courses at the University of Dar es Salaam. This is an interesting study and the first of its kind in the literature to evaluate the academic performance of students under affirmative action programmes aimed at narrowing gender gaps in human capacity building in developing countries. Since 1997, University of Dar es Salaam has been enrolling female students who may not have attained the minimum cut-off point for admission into science based courses although they have the required basic qualifications. Under this pre-entry programme, female students undergo six weeks of remedial training after which they do a pre-entry exam. However, since the introduction of this unique programme, little or no detailed information on empirical studies on the performance of these pre-entry female students is available. The lack of such information is therefore an obstacle to reducing gender gaps in human capacity building and this consequently hinders economic development.

Higher education and more especially science based is repeatedly positioned by the international community as a central site for facilitating human capacity building that is essential to economic and social development in low-income countries (World

Bank, 2002). However, globally, there are concerns about who gains access to higher education more especially to science based courses and whether some socio-economic groups are persistently marginalized (World Bank, 2002). Studies by Lihamba et al. (2004), Wassena (2003), Rwegelera (2007) and Malekela (1999) argue that, while there has been no deliberate attempt to marginalize female enrolments, the performance of girls at secondary school is poorer than that of boys, because of the pressures resulting from socio-cultural processes such as societal expectations and demand for early marriages. Bookie Kethugisile, et al. (2000) also indicates that social-economic and cultural factors which inhibit girl's access to education in primary and secondary levels effectively cut off their access to tertiary education and limits their human capacity building.

Mlama (2005) have also illustrated how the school environment is not friendly for girls in secondary schools. They give examples of infrastructure being not conducive, such as the type, location or poor condition of latrines for girls, which is especially difficult when they are in menses; distant/authoritative teacher-student relationships; aggressive behavior in student-student interaction; and irresponsible school management systems, all of which impact on identity formation within the school setting. The non-intervention by teachers and school managers even when there are obvious gender disadvantages is also discouraging to girls, hence the low retention and achievement that are experienced in

secondary level (Morley et al., 2006; Lihamba et al., 2006). There are many explanations for the gender gap in enrollment at higher education level including low enrolment in basic education and gendered socio-cultural practices (Sima et al., 1999). In Africa, based on misconception, women students tend not to enroll in fields of science, Technology, Engineering (Rathgeber, 1995). It can also be attributed to the social and cultural behavior and perception in relation to the field of science as male domain

In realization of continued gender disparities in enrollment and human capacity building at higher education levels, several affirmative actions have been introduced in various universities to expand women's access to higher education in Tanzania. Improving girls access to higher education more especially to science based education, with the goal of attaining gender equality, is a critical component of promoting development and meeting the Millennium Development Goals (MDGs) in Tanzania (MOE, 2010). The government of Tanzania has implemented policies and established administrative structures to support increased enrolment and broadened participation in higher education (URT, 1999). Due to increased policy commitments and other pressures to address gender inequality and inequity at the University of Dar es Salaam, a number of processes were adopted which became the springboard and nurturer of the education action programmes at the institution. It was however the introduction of the University of Dar es Salaam Corporate Strategic Plan (CSP) (1994), the core document that defines University of Dar es Salaam's plans and strategies for transformation, set in motion developments which saw systematic increase in enrolment numbers through institutionalization of affirmative action's that have been instrumental in narrowing of gender gaps in human capacity building.

Pre-entry Programme (PEP) is one of the more commonly used education programmes that the University of Dar es Salaam has used as strategy to open up and increase female's enrolment in science courses. Pre-entry programme (PEP) was introduced in 1997 to address the Faculty of Science's concern in addressing the relatively small number of female students in the Faculty. In their strategic plan, the programme is considered as the immediate approach to effect an increase of the number of female candidates who may not have attained the minimum cut-off point for admission into the science based faculties although they have the required basic qualifications in order to "increase the proportion of female students from 15% (in 1996/97) to about 30% in the year 2003" (Faculty of Science, 2001). The Faculty of Science also prepares candidates for admission in other science related degree courses such as engineering, pharmacy, environmental

engineering, dentistry, and nursing within this programme. Currently, the six weeks remedial/pre-entry programme benefit only candidates with a science background. The Dutch government under the Teacher Education Assistance in Mathematics and Science (TEAMS) project funded the first cohort. The Forum for African Women Educationalists (FAWE), FAWE and Gender Dimension Programme Committee (GDPC), and GDPC funded the second, the third and the fourth respectively.

It has been found that the policies made have positive results in increasing females enrolment in science courses at the University of Dar es Salaam, although the number has not reached parity by sex. A study by Lihamba, et al (2006), show that affirmative action programmes have succeeded in increasing female enrolment generally and in traditionally male-dominated specializations such as Engineering, Medicine, Chemistry, Physics and Mathematics specifically. However, what is not clear is whether the female students enrolled under the pre-entry programme academically perform like other students who met the minimum university admission criteria.

Empirical evidence on the gender differences in academic performance is available but the evidence is mixed (see Hyde and Kling, 2000; Meltem and Serap, 2004; and Tasisa and Tafesse, 2013). However, little is known about the academic performance of female students admitted to higher institutions under affirmative action programmes compared to those who met the higher education admission criteria. This paper intends to fill this research gap by utilizing secondary data collected from University of Dar es Salaam records. An understanding of this process is important from a policy perspective because it provides information relevant to education policy design aiming at increasing access of females to higher education levels more especially to science based courses and narrowing the gender gaps in human capacity building. Our descriptive results show that academic performance of female students enrolled under the pre-entry programme is on average lower than for students who met the university admission criteria. However, female students who met the university admission criteria on average outperformed their male student's counterparts. The rest of the paper is organized as follows. The next section reviews the existing literature. The third section describes the methodology. The fourth section discusses the results and the last section concludes.

LITERATURE REVIEW

There are limited studies that evaluate the performance of students enrolled under special programs such as pre-entry program that aim at increasing access of women to higher levels of education and narrowing the gender gaps in human

capital building. Most of the existing studies on admission under special programmes focus on access as opposed to achievement. The policy implications of evaluation studies that focus on achievement could be different from studies that focus on access. Previous studies mostly address gender disparity in academic achievements of students admitted on the same criteria. In higher education women are often found to outperform men. Hyde and Kling (2000) state this to be the case irrespective of the measure of success used. A study by Meltem and Serap (2004) shows that a smaller number of female students manage to enter the university in Turkey and when they do so, they enter with lower scores. However, once they are admitted to the university, they excel in their studies and outperform their male counterparts. This result holds after controlling for the field of study and individual attributes. Turut-Asik and Dayioglu (2004) also found that a smaller number of female students apply for university admission in Turkey. Once they get admission, they work hard to earn better grades than their counterpart male students.

Betts and Morell (1999) also report that sex remains a significant predictor of CGPA after controlling for various individual attributes such as ethnic background, SAT scores and the high school attended. Similarly, investigating about 60,000 students from 22 public research universities, Kim, Rhoades and Woodard (2003) find that SAT scores have a significant impact on student graduation, although at the individual level, gender is a more powerful correlate of graduation than the SAT score. Women are also found to obtain better grades than would be predicted from their SAT scores (Leonard and Jiang, 1999; Hyde and Kling, 2001; Bridgeman and Wendler, 1991; Wainer and Steinberg, 1992).

In addition, Ismail and Othman (2006) show that female students have better results than their male counterparts in the Faculty of Business and Accountancy, Faculty of Arts and Social Sciences. Generally, female students outperformed male students. The difference in academic performance could be due to high prior academic ability among females as compared to the male students. Leonard and Jiang (1999) suggest that females have better study skills than the male students. Other researchers have argued that women receive higher grades than men because they work harder and attend class more frequently (Wainer and Steinberg, 1992).

The above findings are contrary to literature cited in Smith (1994) which states that academic achievement disparity is minimal between female and male students in language and social sciences as compared to natural sciences and mathematics courses. International assessments of student achievement in reading, mathematics and science report some

consistent gender patterns. The most visible and clear gender difference is the advantage of girls in language and humanity studies that encompasses social science fields or streams. This advantage is consistent across countries, different age groups, survey periods and study programs (Lafontaine & Monsieur, 2009). Smith (1994) also shows that female students' academic performance in language and social science courses is better than that of male students, while male students' academic performance in natural science and mathematics is better than female students. In addition, Tasisa and Tafesse (2013) show that there are statistically significant differences between male and female students in academic achievement at tertiary education level in Ethiopia. Male students were shown to be significantly performing better than female students.

The literature survey on gender differences in scholastic performance at higher levels of education indicates mixed results. However, one common finding is that females outperform their male counterparts in higher education. However, limited studies have been undertaken to establish whether female students admitted with lower grades under special programs perform equally or better than other students admitted under normal admission criteria at the University of Dar es Salaam. The study at hand attempts to fill this research gap.

METHODOLOGY

Theoretical Framework: One of the basic principles of managing educational programmes is to evaluate the extent to which they serve the purposes for which they were established for. The evaluation process usually focuses on the various aspects of the programme's inputs, processes, and outputs. Indeed, the purpose of evaluation is to make judgments about the efficiency, effectiveness, relevance, sustainability, merit, value, and worthiness of educational programmes (Borg and Gall, 1989). Such judgments are usually guided by the epistemological foundations of generating knowledge.

Indeed, researchers (Codd, 1988; Juran, 1989) have raised concerns about the assumptions of the epistemological traditions and theories (positivism, hermeneutics, critical theory, and change theory) guiding evaluation of educational programmes. The basis of raising such concerns is because the assumptions of each of these epistemological traditions in terms of the generation of valid and reliable knowledge are different, sometimes contradictory and lead to different conclusions. In this study, we adopt positivism theory to evaluate the relevance, sustainability, merit, and value of the pre-entry educational programme. This study is guided, in part, by positivism assumptions in the sense that it sought to examine the academic performance of pre-entry students as reflected in educational outcomes.

A number of indicators can be used to determine the academic achievement of students. Characteristics and educational outcomes such as Cumulative Grade Point Average (CGPA), leadership, exposure, creativity and motivation are used to measure academic achievement. In the literature, the most frequently employed measure of academic achievements is students' cumulative grade point average (CGPA). In this paper, we also primarily rely on CGPA to measure academic success as this indicator is scientific, that is, it is factual, cumulative and progressive and therefore fulfils one of the assumptions of positivism theory (see Codd, 1988).

Both pre-entry female students and other female and male students who were admitted based on the minimum criteria were taking the same course content, taught by the same lecturers, wrote similar tests and assignments, and sat for the same final examinations. The only difference between pre-entry students and other students was the mode of entry to the science based programmes. It should therefore be possible to compare the academic performance of pre-entry female students and other students.

Study Site: The University of Dar es Salaam is the largest public university in Tanzania, and is also the oldest. First established in 1961 as a College of the University of London, it became a constituent college of the University of East Africa in 1963 and a national university in 1970. The university teaches many courses including science based courses on which this study focuses on, such as, pharmacy, medicine, environmental engineering, dentistry, and nursing.

Data: The data for this study come from the undergraduate student records compiled by the registrar's office of University of Dar es Salaam. We were provided with an extract of this data reflecting the mode of admission, gender, course and CGPA of the students for the all the graduation cohorts from 2001 up to 2009.

Data Analysis: The data collected and secured from University of Dar es Salaam records were structured, organized and framed to suit analysis and inferences. The data were presented using descriptive and inferential statistics. Based on the nature of the basic research questions, the data were analyzed using descriptive statistics because of its appropriateness. We employed t-test to analyze the significant differences in academic achievement between the male students and female students (both pre-entry and non pre-entry programme) in science based courses at the University of Dar es Salaam. Male students were used as base category for comparison.

LIMITATIONS OF THE STUDY

One of the limitations of this study might be the drop-outs from the science based courses. The data set we employ does include students who graduated but not those who have failed out of their classes and face possible dismissal and those who dropped out for personal reasons or were dismissed in earlier semesters. Dismissal occurs if a student fails to accumulate a total of 1.80 points at the end of three consecutive semesters. The rate of dismissal and drop outs at University of Dar es Salaam is rather low and we therefore do not expect them to impact on our results significantly. The other limitation of this study is that we could not carry out multivariate analysis because of lack of data on relevant variables. Future studies could control for other relevant variables that affect academic performance of students.

FINDINGS AND DISCUSSIONS

Summary descriptive statistics of CGPA of students undertaking science based courses used in the analysis are presented in Table1. It reports the mean, standard deviations, minimum and as well as the maximum values. The standard deviations of CGPA are lower than the means, indicating a narrow spread around the means. Table1 also shows the t-statistics that indicate the significance of differences in CGPAs between male and pre-entry female students, and male students and non pre-entry female students. Figure1 shows the trend in performance of pre-entry female students, non pre-entry female students and male students.

Pre-entry students are shown to have consistently performed below other groups of students (see Fig1) although the difference is significant in only four years out of nine years considered in this study. Although pre-entry female students are entering the University of Dar es Salaam with lower grades, they did not show any progress in their academic performance. This finding is in contrast with previous studies which show that females who enter Universities with lower grades end up outperforming male students (Turut-Asik and Dayioglu,2004). Pre-entry female students on average underperformed their counter parts suggesting that the affirmative action may not necessarily be a meritorious way of increasing access of female students to the university. Although the pre-entry programme has increased access to science based courses at the University of Dar es Salaam in the short term, a more sustainable way or long term strategy is to increase enrollment of female students at lower levels of education. There is need to understand the barriers to access of female students to lower levels of education. Understanding those barriers would guide the design of appropriate policies to increase access of female students at lower levels of education and consequently increase enrollment at higher levels of education.

Table1: Descriptive Statistics

Student category	Statistic	2001	2002	2003	2004	2005	2006	2007	2008	2009
Male	Min	2.8	2.4	2.4	2.5	2.4	2.2	2.6	2.5	2.5
	Max	4.4	4.4	4.4	4.7	4.5	4.8	4.4	4.3	4.3
	Average	3.5	3.4	3.3	3.4	3.3	3.3	3.4	3.3	3.3
	STD	0.38	0.43	0.42	0.48	0.44	0.44	0.40	0.41	0.38
Pre-entry females	Min	2.8	2.8	2.4	2.7	2.4	2.6	2.7	2.7	2.7
	Max	4.2	3.8	3.8	3.8	4	3.9	3.8	4	4.1
	Average	3.4	3.4	3.1	3.2	3.1	3.2	3.3	3.2	3.2
	STD	0.35	0.25	0.32	0.31	0.29	0.38	0.26	0.32	0.38
	t-statistic	1.32	0	2.78***	2.76***	2.97***	1.20	1.65*	1.40	1.25
Non-pre-entry females	Min	2.9	2.5	2.5	2.7	2.5	2.6	2.8	2.6	2.6
	Max	3.9	4.2	4.3	4.3	4.3	4.4	4.3	4.2	4.2
	Average	3.6	3.4	3.6	3.4	3.2	3.5	3.5	3.3	3.3
	STD	0.31	0.39	0.35	0.40	0.44	0.42	0.33	0.42	0.34
	t-statistic	1.8*	0	4.8***	0	1.34	2.78***	1.70*	0	0

Source: University of Dar es Salaam records. *, ** and *** indicates statistical significance at 10 percent, 5 percent and 1 percent respectively

As shown in Table 1 and Figure 1, non pre-entry female students on average performed better than male students. For example, the observed mean scores of non pre-entry female students were higher than the mean scores of male students. However, the observed differences were only statistically significant in four out of the nine years considered in this study. This finding is consistent with most studies that show that female students perform better than male students at the university level (see, Meltem and Serap, 2004 and Hyde and Kling, 2000). However, this finding is in contrast to the argument by Marsh, Koller & Baumert (2001) that underrepresentation causes low self concept which in turn causes low academic achievement.

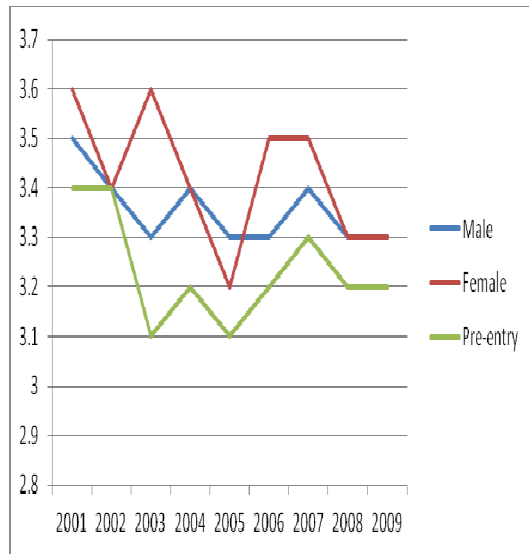


Figure 1: Trends in Performance

CONCLUSION

The main aim of this study was to establish whether females enrolled at the University of Dar es Salaam under the pre-entry programme perform equally like other students who were enrolled normally. The study has established that with their lower university entrance scores, female students admitted under the

pre-entry program underperform their male and female counterparts during their university years. However, on average, non pre entry female students performed better than male students. This may suggest that the pre-entry programme affirmative action may not necessarily be a meritorious way of increasing access of female students to the university. To increase access of female students to science based courses at the University of Dar es Salaam, the long term strategy is to increase access of female students at lower levels of education. Understanding the barriers to access of female students to lower levels of education can guide policy makers on how to increase their access.

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