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Research Application Summary

Factors affecting academic performance of female students at Mekelle University, Ethiopia

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Abstract

The study examined factors affecting academic performance of female students in Mekelle University, Ethiopia. A total of 392 regular undergraduate students were sampled using (i) stratified random sampling-since students stratified into heterogeneous colleges and departments, (ii) proportional sampling method since number of students differ in all departments, and (iii) simple random sampling to select respondents. Students were ranked from 1-4, where as: 4 = $CGPA \geq 3.75$, 3 = $CGPA < 3.75$ & $CGPA \geq 3.5$, 2 = $CGPA < 3.5$ and $CGPA \geq 3.25$, 1 = $CGPA < 3.25$. An ordered logit model was used to analyze data. Results indicated that academic background of students such as National examination results of grade 10 and grade 12, study strategy, choice of department, and involvement in network studying system were significant determinants of academic performance. Socio-economic characteristics of parents and tutorial class did not have a significant impact on academic performance. Strategies should be developed to allow weak students learn and take up study and time management strategies employed by high academic performers.

Keywords: Academic performance, female students, Mekelle University

Résumé

L'étude a examiné les facteurs qui affectent la performance académique des étudiantes à Makelle University, en Ethiopie. Un total de 392 étudiants réguliers de premier cycle ont été échantillonnés à l'aide (i) d'échantillonnage aléatoire stratifié-puisque les étudiantes stratifiées sont dans les collèges et les départements hétérogènes, (ii) la méthode d'échantillonnage proportionnel puisque le nombre d'étudiants diffèrent dans tous les départements, et (iii) Répondants. Les Etudiants étaient classés de 1 à 4, où: 4 = $CGPA > 3,75$, 3 = $CGPA < 3,75$ & $CGPA \geq 3,5$, 2 = $CGPA < 3,5$ et $CGPA \geq 3,25$, 1 = $CGPA < 3,25$. Un modèle logit ordonné a été utilisé pour analyser les données. Les résultats indiquent que les antécédents scolaires des étudiantes, comme les résultats des examens nationaux de la 10ème et de la 12ème année, la stratégie d'étude, le choix de département d'étude, et l'implication dans le système de réseau d'étude ont été des déterminants importants de la performance académique. Les caractéristiques socio-économiques des parents et les cours de renforcements n'ont pas eu d'impact significatif sur la performance académique. Des stratégies devraient être développées pour permettre aux étudiantes faibles d'apprendre et d'adopter les stratégies d'étude et de gestion du temps employées par les étudiantes ayant des performances académiques élevées.

Mots-clés: performance académique, étudiantes, Mekelle University

Introduction

The function of a higher education institution is to produce intellectuals for a society who will be the key brain power of the country (Sangkapan and Laeheem, 2014). Students who will further their higher education are required to take standard Admission Entrance Exams. Therefore, most admitted students are considered intelligent and can join faculties of their choice. They are also expected to complete their courses. In reality, however, some students may not achieve their goals while others may perform more than their expectation due to different reasons. The social and economic development of a country is directly linked with students' academic performance. The students' performance (academic achievement) plays an important role in producing graduates who will become great leaders and sources of manpower and thus support a country's economic and social development (Mushtaq, 2012).

According to Martha (2009), academic performance is affected by a number of factors including admission points, socio-economic status, school background and some demographic characteristics such as age, location of residence, household income and parents' education. Geiser and Santelices (2007), Acato (2006), and Swart and Kuriakose (1999) all argue that admission points, which are a reflection of the previous performance, influence future academic performance. Different researchers agree with the idea that admission points affect academic performance at university, and that is why, according to the Uganda Universities and Other Tertiary Institutions Act (2001), the basis for entry to university is attainment of a minimum set admission points which are derived from A' level, diploma or mature age entry examinations.

Hill and King (1993) argued that educating females yields far-reaching benefits for girls and women themselves, their families and their societies in which they live. The benefits of investing in human capital are especially pertinent for women in developing countries where gender equity in education is often lagging behind. Without educating women, national endeavors can be less effective and the efforts of women are weaker. Equal opportunity of education for both sexes is equally important. However, in a number of developing countries, the participation of women in education is characterized by low enrolment and poor performance.

As such, making education accessible to girls helps to increase participation of women in every socio economic and political sectors. However, performance of participating girls also matters equally or even more as the end is their success and empowerment-driven overall social development. Enhancing the academic performance of female students requires understanding factors, which, directly and significantly, affect it. Only then can one think of designing appropriate measures and incentives to enable women. Apart from the broad classes of factors mentioned earlier, detailed individual characteristics and their correlation with academic performance have not been rigorously investigated in the public universities in Tigray. The present study seeks to add knowledge on this subject.

Summary of literature review

Literature shows that socio-economic status, socio-cultural beliefs, and unfavorable school environment, political and institutional conditions can affect female education in general and their academic performance in particular. Similar research works in Ethiopia have also pointed out girls' low level of school attainment and correspondingly low levels of literacy, political integration, and economic productivity (Abraha *et al.*, 1991). Currently, girls' education is a critical development agenda given its inherent value to individual girls, and tremendous benefits for society. The significant contribution of female education is expressed in terms of economic, cultural and political aspects of a country. Obanya (2005) stated that an educated female is likely to become a more competent and knowledgeable mother, a more productive and better paid worker, an informed citizen, a self-confident individual and a skilled decision maker. Geiger (2002) indicated that the benefits of education relates to more or less all aspects of development. Education empowers them to participate in the public and political life. The potential benefits of education are always present but females' education often has stronger and more significant impact than males' education (King, 1990). However, this does not mean education is unnecessary for males.

Materials and methods

Description of study area

Mekelle University is found at Mekelle town in Tigray region Northern Ethiopia, 783 Kilometers far from Addis Ababa the capital city of Ethiopia. At present 2015/2016 MU hosts over 31,000 students in the regular, continuing education programme and summer, evening, distance education and in-service programs in both undergraduate and graduate programs. Mekelle University is thus now a government-funded higher institution with an international reputation for teaching and research and with collaborative understanding with national and international sister institutions. Since its establishment, it has proved to be one of the fastest growing Universities in Ethiopia. The University has seven colleges, eight institutes and more than 73 departments.

Data sources

Primary data were mainly gathered using structured questionnaire. Besides, we obtained secondary data sources that supplement the primary data from the university registrar's office. These include enrolment and attrition report of the students; other research papers related to women's education were also consulted for consistency.

Sampling method

The study used a number of sampling techniques. We used implicit stratified and stratified random sampling methods since students are stratified into heterogeneous colleges and departments. Then proportional sampling was used to distribute the sample into colleges and departments since colleges and departments have different sizes. Finally, simple random sampling was employed to select respondents. Using this method,

7 out of 15 colleges and institutes in Mekelle University were randomly selected. Out of 6,667 total undergraduate regular female students in the University, 3493 are found in the selected colleges, and 2,758 of them are found in the sampled departments. Out of these, a target population 350 female students were selected using Yemane formula of sample determination with 5% acceptable error term. In addition, we included 100 male students for comparative purposes. Thus, our overall sample has 450 students. Since colleges have different population size, we used proportional distribution of the sample size to each stratum (college) and simple random sampling to select departments and respondents. The formula used to determine sample size was:

$$n = \frac{N}{1 + N(e)^2}$$

Where, N= total population, n= sample size, e= the level of precision /Acceptable error, e = 4% (0.05) level of precision.

Based on the above formula and given our target population, our sample size becomes, $n = 2758 / (1 + 2758(0.05)^2) = 350$.

Even though we set out for a total sample of 450 students, only 392 questionnaires were properly filled and thus used in the analysis.

Data analysis

Both descriptive and econometrics analyses were applied to describe and investigate the trend of and correlation with several factors of academic performance. Descriptive statistics such as tables with mean difference test and chi-square test and graphs were used. These were useful to explore the data, view the trend of academic performance and make comparison between different categories such as across gender. Among the different econometric model estimation techniques used in identifying factors that affect academic performance of students, logit and probit models are the most commonly used models (McKenzie and Schweitzer, 2001). Gujarat (2004) argues that although both models result in similar outputs, the logit model is easier in estimation.

Hence, logit model could easily use by classifying students in to two as, as those who have good academic performance and poor performers. However, an ordered logit model was used to take advantage of the additional information about students' levels of academic status. Moreover, to see what determines the detail difference in academic status. Thus, students were ranked based on registrars' status determination criteria using their cumulative grade point average (CGPA) as:

Rank 4 if $CGPA \geq 3.75$ (Exceptional)

Rank 3 if $CGPA < 3.75$ and ≥ 3.5 (Excellent)

Rank 2 if $CGPA < 3.5$ and ≥ 3.25 (Distinction)

Rank 1 if $CGPA < 3.25$.

Model Specifications

Ordered Logit Model. For ordinal dependent variables, the appropriate model is the ordered logit or probit model, which takes the ceiling and floor effects into account and avoids the

use of subjectively chosen scores assigned to the categories (Hanushek and Jackson, 1977). For ordinal dependent variables, the appropriate model is ordered logit model. Grades of school, for example, should be viewed as an ordinal measure of an underlying variable, “educational attainment,” when one wishes to recognize that each grade is not equally easy to attain (Mare, 1980) or equally rewarding (Featherman and Hauser, 1978; Jencks, 1979). Ordinal variables are non-strict monotonic transformations of interval variable. One or more values of an interval-level variable could be recorded into the same value of a transformed, ordinal variable (Winship and Mare, 1984).

Model specification

Following Wooldridge (2010) the ordered logit model for determinants of female students’ academic performance was specified as follows:

$$Y_i = CGPA = \beta x_i + \varepsilon \dots \dots \dots (1)$$

Where Y_i is Rank in academic performance of the i^{th} student explained by their cumulative GPA. The highest rank was assigned to the highest academic performance and it is ordinal variable, which takes a value of:

- $Y_i = 1$ if CGPA is below 3.25
- $Y_i = 2$ if CGPA is between 3.5 and 3.25,
- $Y_i = 3$ if CGPA is between 3.75 and 3.5,
- $Y_i = 4$ if CGPA is above 3.75

X_i is a vector of explanatory variables and ε is the disturbance term, which is assumed to be logistically distributed with zero mean.

$$f(\varepsilon) = \frac{\exp(\varepsilon)}{1 - \exp(\varepsilon)} = \frac{1}{1 - \exp(-\varepsilon)} \dots \dots \dots (2)$$

Thus: $pr(Y_i = j) = pr(CGPA \text{ is in the } j^{th} \text{ range}) \dots \dots \dots (3)$

Hence, the probability of observing an outcome could be written as:

$$pr(Y_i = j) = f(\mu_j - \beta x_i) - f(\mu_{j-1} - \beta x_i) \dots \dots \dots (4)$$

This shows that: $pr(Y_i = j) = \frac{1}{1 + e^{-\mu_j + \beta x_i}} - \frac{1}{1 + e^{-\mu_{j-1} + \beta x_i}} \dots \dots \dots (5)$

This equation can be used to derive a likelihood function and then maximum likelihood estimates of μ and β (Baldemir, Ozkoc, Bakan and Yesildag, 2012; Wooldridge, 2010).

Research Application

Student Enrolment and Attrition Rates. The difference in enrollment and attrition trend between male and female students are reflected in Figures 1 and 2. Enrolment was higher among male students than female students in all the three years (Figure 1). This revealed that fewer female students get retained and are able to complete their education given their enrolment levels yet high attrition rate compared to males. However, the overall enrolment of female students has been increasing continuously over years. This increase however is not helped by a significantly high attrition rate of female students (Figure 2).

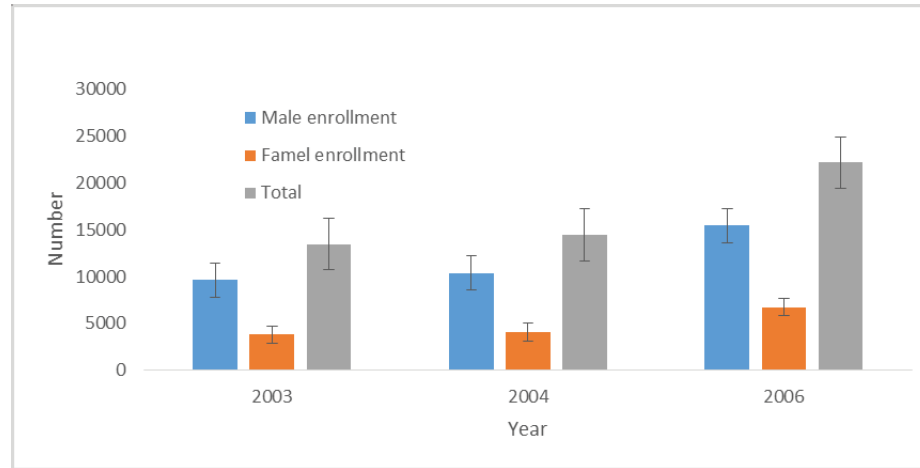


Figure 1. Enrolment trend of students

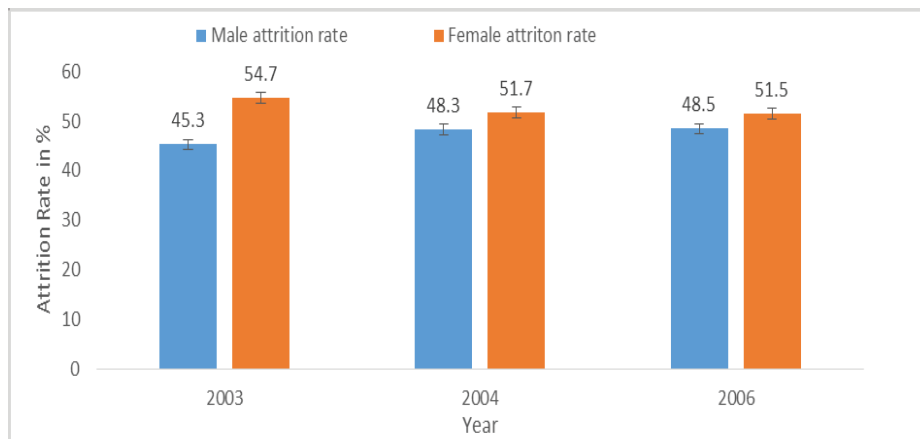


Figure 2. Attrition trend of students

Factors affecting academic performance of female University students. The basic determinants of academic performance are academic background (that is national exam result of grade 10) department choice and studying strategies of students (Table 1). Those who study on continuously relative to those who study before exams are 12% less likely to be on the least academic rank, while they are 5.2% more likely to be on the second rank of academic status, this is significant at 5% level for both. In addition, they are 4% and 3% more likely to be in the third and fourth academic ranks. These are significant at 10% level for both. These results indicates the importance of time management practice in academic performance. Students' time is a limited resource, which is the key for good academic performance, and the most challenging thing to practice for University students.

Table 1. Marginal Effects of Ordered logit model

Variable	M	arginal effect	S	tandard error	Z	value
SEX_predict:	1	.1379822		.0542139		2.55**
	2	-.0635678		.0260263		-2.44**
	3	-.0457389		.0200527		-2.28**
	4	-.0286755		.0143402		-2.00**
result10_predict:	1	-.1508936		.0521947		-2.89***
	2	.069516		.0253013		2.75***
	3	.0500188		.0198434		2.52**
	4	.0313588		.0145906		2.15**
lresult12_predict:	1	-.2026127		.1992831		-1.02
	2	.0933428		.0920607		1.01
	3	.0671629		.0673475		1.00
	4	.0421071		.0437648		0.96
4.study_predict:	1	-.1310896		.0647696		-2.02**
	2	.0625685		.0329752		1.90*
	3	.0425349		.0220903		1.93*
	4	.0259862		.0145953		1.78*
4.stdystgy_predict:	1	-.1190773		.0570165		-2.09**
	2	.0518156		.0252975		2.05**
	3	.0401746		.0207835		1.93*
	4	.027087		.0157091		1.72*
4.choicdpt_predict:	1	.1574136		.0589929		2.67***
	2	-.0832912		.0361794		-2.30**
	3	-.0482236		.0189211		-2.55**
	4	-.0258988		.0111907		-2.31**
Networkstudy_predict:	1	-.1066788		.0488654		-2.18**
	2	.0491464		.02329		2.11**
	3	.0353623		.0175282		2.02**
	4	.02217		.0122506		1.81*

*** p<0.01, ** p<0.05, * p<0.1; Source: Own computation based on survey data

Conclusion

Based on the findings of this study, academic performance of students depends more on their time management strategies, studying strategies, their department choice and educational background. Educational background of parents and their socio economic status and students transfer income were insignificant determinants of academic performance. Strategies that help to improve student's academic background from lower levels (primary school), to high school include admitting them to their preferred faculties, and network studying. Furthermore, arranging experience-sharing sessions time management would help the weak students improve their academic performance.

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