

Are female and postgraduate teaching assistants more effective? An investigation of how the gender and experience of teaching assistants affect students' performance

Paper prepared for presentation at the 2009 ASSA meetings, San Francisco, USA, 2-5 January 2009. (Work-in –Progress, please do not circulate)

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Abstract

Tutorial programmes have become important academic support initiatives in which peer learning is encouraged. Tutors are a crucial part of this process and it is important to investigate whether tutors, in particular their gender and experience, impact on the academic performance of students. This paper investigated the influence of the gender of tutors and their level of experience on the academic performance of first-year economics students. The main finding is that male students, who are tutored by males, perform relatively better than male students who are tutored by females. The experience of the tutor (i.e. whether they have tutored before) does not have a significant influence. These results are, however, not upheld in the case of compulsory tutorial attendance.

1 Introduction

The academic success of first-year students has received much attention in the educational literature. Siegfried and Fels (1979) suggested an education production function approach where academic performance is determined by various inputs such as tutorial programmes. These academic support initiatives are an integral part of academic programmes, especially within the large class environment. Tutorials provide a more comfortable setting within which peer tutoring and learning can take place. Economics is one of the subjects at South African universities with large first-year classes and students feel more at ease to ask questions within the smaller tutorial groups (Hutcheson and Tse 2006). Tutorials are therefore crucial in efforts to provide more personalised attention, particularly to underperforming students.

With average first-year class sizes of 200 to 350 students, the Economics Department at SU has a structured first-year tutorial programme. It employs mostly senior students within the discipline as tutors¹, to provide academic assistance to students. These tutorials take the format of weekly meetings where specific problems related to the discipline are discussed.

The effectiveness of tutorial programmes has been tested in the literature and the findings indicate that tutorial programmes make a positive contribution to the academic performance of students (see Horn & Jansen, 2008). This study aims to add to existing literature by investigating the effect of the gender and the experience of the tutor on the academic performance of first-year economics students. In particular, the study will explore the hypothesis that students who are attending tutorial classes of a tutor that is of the same gender, will perform relatively better. Regarding experience, the question of whether previous tutoring experience, as well as the graduate level of the tutor, has any impact on the students' performance, will also be explored.

The outline of the paper is as follows: the next section explores the existing literature on the gender of tutors (and teachers) and the impact thereof on the academic performance of students. It also explores the question of whether the previous experience of the tutor has had any significant effects. Section 3 provides some discussion on the context within which the research questions have been investigated. It will provide information on the tutorial programmes at a South African university and place the programme within the appropriate institutional context. Section 4 outlines the data collection process and section 5 provides some descriptive statistics. Section 6 discusses the econometric analyses and the findings, while section 7 concludes.

2 Literature Review

Gender differences, particularly relating to peer tutoring, have not been widely researched in the field of Economics Education. Most of the literature on the characteristics of economics male and female students indicated that there is a perceived difference in the learning style of the genders. This difference is also present in the way they perform, given the type of questions, i.e. multiple choice or essay questions (see Keri 2002; Hirschfeld, Moore and Brown 1995; Greene 1997; Parker 2006; Horn and Jansen, 2008). This difference

¹ In this study, tutors and teaching assistants are used synonymously.

in performance is possibly due to other factors, such as educational background and sexual stereotyping (Miller and Budd 1999; Siegfried 1979).

According to Keri (2002) both gender groups report a positive experience if they have instructors that anticipate the individual learning characteristics of the group. Females usually prefer knowledgeable instructors who are efficient and proficient users of language. Males prefer applied instruction that uses examples of day to day activities. The assumption is that generally, women would prefer female instructors, and men instructors that have the same characteristics as themselves. Miller and Chamberlin (2000) found that students tend to perceive male instructors as being on a higher level of intellectual attainment than female instructors. This bias towards a specific gender indicates that, when evaluating the effectiveness of the instructor, the students' gender expectations of the teacher do not result in an objective assessment of the instructor. Tutors receive evaluations that are not a true reflection of their abilities but a reflection of how a student thinks a tutor of a specific gender should perform. (Sprague and Massoni 2005; Schmidt and Moust 1995).

Studies on the impact of the tutor's gender on the academic performance of the student have either had insignificant results, or there was some uncertainty about the robustness of the findings (Butler and Christensen 2003; Robb and Robb 1999). Butler and Christensen (2003) found that the gender of the tutor does have a positive effect on whether a female student continues to major in a specific course. Dynan and Rouse (1997) also commented on this although the positive result was not significant. Furthermore, in the discipline of political science, men with female tutors outperform those with male tutors (Butler and Christensen 2003). In the same study it was found that women with female tutors also outperform those with male tutors. The only significant result, however, was the dummy for females with male tutors.

Groves et al. (2005) in a study testing the effect of tutor expertise on the performance of the student found that permanent staff members had higher scores than non-permanent staff members. On the assumption that tutors are non-permanent staff members, permanent staff were more able to motivate learning and were better at promoting effective group functioning. Hanushek (1971: 285) found, in an earlier study with primary school teachers, that the "recentness" of education is a positive characteristic in the educational process and by implication, that enthusiasm can be more motivating in the

teaching/learning process than experience. This finding is supported by Alaie (2008) who indicated that teaching assistants with less experience do equally well as those with more experience. In addition, the tutors with less experience were more highly rated by their students. These findings were, however, reported in disciplines other than economics.

3 The economics tutorial programme

Stellenbosch University (SU) has as one of its aims to become a learning institution that is recognised by the innovative way in which teaching occurs. To encourage this, ongoing evaluation and renewal of teaching and learning programmes occur. This results in the creation of a variety of opportunities for learning and studying, especially for first-year students. This process is driven by the First year Academy of Learning initiative which is aimed at improving the success rate of first year students. The entire university community is involved in this comprehensive action which was implemented in 2007 (Stellenbosch University, 2008). Tutorials are a crucial component of these initiatives.

The Economics 114 (ECO114) module is an introductory microeconomic course at SU in the first semester. The module assessment comprises of tests written during the semester and a final examination. Students must write two of the three semester tests as well as pass three electronic tests on WebSTudies, to obtain a satisfactory course mark (i.e. a 40% course mark is a prerequisite to write the examination).

Different academic support initiatives have been utilised to improve success rate of the ECO114 students. In addition to the e-learning tests (via WebSTudies), a tutorial programme offers extra academic support in the form of small classes, where problems encountered are discussed.

The tutorial programme employs both senior and postgraduate economics students as tutors. These students are interviewed, and selection is based on a set of criteria such as academic profile, communication and presentation skills, and personality traits. All appointed tutors attend compulsory tutor training, where issues such as group work, presentation skills and maintaining work ethic and discipline are discussed.²

² The training is offered by SU's Centre for Teaching and Learning.

The functioning of the tutorial programme is coordinated by a programme administrator, whose is responsible to liaise with the tutors and the lecturers teaching ECO114. It is quite important for the Department of Economics that tutorials be viewed as an integral part of the module. Therefore, a close working relationship exists between the programme coordinator, the lecturers and the tutors. Tutors receive tutorial exercises which address problem areas identified. Meetings with the tutors take place on a weekly basis to discuss any relevant matters.

In 2008 compulsory attendance were implemented for some students. Students, who did not manage to pass an early assessment test, were compelled to attend tutorials in the second quarter.³ The ECO114 class therefore comprised of students who attended tutorials on a voluntary basis, those who were compelled to attend, and students who decided not to attend any tutorials.

4 Data Collection & Methodology

4.1 Data

This study uses a variety of data sources. Demographic information on the ECO114 students was obtained from the university records. This included information on the school results of the first-year students, age, gender, home language, race and other academic information such as the degree programmes they are registered for. In addition, lecture and tutorial attendance records were obtained from the Economics department, as well as information on the students' academic performance, i.e. the results for the tests taken, examinations and the final marks achieved. The study also obtained information from the Department's student evaluations on the tutors, conducted at the end of the tutorial classes.

4.2 Descriptive Statistics

This section provides detailed information on the ECO114 course and its tutorial programme. Table 1 reflects some demographic statistics on the ECO114 students. The majority of the students are White and Afrikaans-speaking. More than 45% are between the ages of 16 and 18 years. Male students comprise 56% of the ECO114 class.

³ At SU, a system of early assessment was implemented to provide the student and the parents with formative information on the student's progress. These tests usually take place towards the middle of the first quarter.

Table 1: Characteristics of the ECO114 students in the sample

	Frequency	%		Frequency	%
Race			Home language		
Black	65	3.16	Afrikaans	1,226	59.57
Coloured	306	14.87	English	742	36.05
Indian	11	0.53	Afrikaans + English	29	1.41
White	1,676	81.44	Xhosa	17	0.83
Age			Other SA language	15	0.89
16-18 years	945	45.92	Other foreign languages	24	1.17
19 years	711	34.55	Gender		
20 years	247	12	Male	1,154	56.07
21-25 years	147	7.13	Female	904	43.93
>25 yeas	8	0.4			

Table 2 presents the study characteristics of the students. Approximately 70% of the students are enrolled for a bachelor degree in the commerce faculty. A more detailed breakdown indicates that the majority of the students in the commerce faculty are registered for a Bachelor of Commerce (BComm) degree, with only 16% of the total group registered for a Bachelor of Accounting (BAccounting) degree. A very high proportion of students stay in the residence or close to the campus (in Stellenbosch). In fact, only approximately 8.5% live with their families.

Table 2: Brief study characteristics of the ECO114 students in the sample

	Frequency	%		Frequency	%
Faculty			Programme		
Agriculture	40	1.99	Bachelor of Arts (BA)	203	10.06
Art	185	9.18	Bachelor of Commerce (BComm)	1413	70.13
Commerce	1,745	86.6	Bachelor of Agriculture (Bagri)	18	0.89
Law	35	1.74	Bachelor of Engineering (BIng)	1	0.05
Science	8	0.4	Bachelor of Accounting (Baccounting)	331	16.43
Unspecified	2	0.1	Bacc LLB	19	0.94
			Bachelor of Science (BSc)	28	1.4
			LLB	16	1.73
			Spec students	2	0.1
Type of Residence					
University residence	926	45	Private hostel	51	2.48
University house	5	0.24	Living with family	175	8.5
Private accommodation	482	23.42	Others	419	20.36

Table 3 indicates the lecture and tutorial attendance of the Economics 114 students. The statistics reveal that just slightly more than 50% of the students attended at least four of the five lecture sessions when roll call was taken. 48% of the students attended six and more tutorials. The data also reflect that more than 55% of the students attended the classes of male tutors. Another important statistic shows that approximately 33% of the class had to attend tutorials on a compulsory basis. The subsequent analysis will separate the tutorial attendance into four groups, namely no attendance, all students attending tutorials, those attending on a voluntary basis, and compulsory tutorial attendance.

Table 3: Lecture and Tutorial attendance

	Frequency	%		Frequency	%
Lecture Attendance			Tutorial Attendance		
Number of lectures: 0	251	12.1	Number of tutorials: 0	389	18.75
1	252	12.14	1	97	4.67
2	216	10.41	2	81	3.9
3	275	13.25	3	100	4.82
4	400	19.28	4	241	11.61
5	681	32.82	5	171	8.24
			6	171	8.24
			7	145	6.99
Tutorial attendance by tutor gender			8	165	7.95
Male tutor	1,154	56.07	9	167	8.05
Female tutor	904	43.93	10	190	9.16
	1686	100	11	158	7.61
Compulsory tutorial attendance					
Voluntary + No tutorials attended	1398	67.38	Compulsory	677	32.63

Table 4 provides further detailed information on the compulsory tutorial attendance. Approximately 56% of the students who were compelled to attend tutorial classes in the second quarter of the semester attended six or more of the eleven tutorials offered.

Table 4: Compulsory tutorial attendance

Tutorials attended	1	2	3	4	5	6	7	8	9	10	11
Frequency	10	8	22	154	105	86	58	79	59	50	46
%	1.48	1.18	3.25	22.75	15.51	12.7	8.57	11.67	8.71	7.39	6.79

Regarding the gender of the tutor, table 5 indicates that 13 of the 24 tutors appointed in the first semester (during which ECO114 was offered), were male. Most of the tutors appointed were registered for postgraduate studies in Economics, either commencing an Honours or a Masters degree. Approximately 46% of the tutors had facilitated tutorial classes (in other disciplines as well) before commencing with tutoring the ECO114 module. The tutors'

language of instruction was split halfway with 50% of the classes offered in English and 50% of the classes offered in Afrikaans.

Table 5: Information on Tutors

	Frequency	%		Frequency	%
Tutor gender			Tutor education		
Female	11	45.83	Postgraduate degree	19	79.17
Male	13	54.17	Undergraduate degree	5	20.83
Tutor experience			Tutor's Language of Instruction		
Tutored before	11	45.83	English	12	50
No experience	13	54.17	Afrikaans	12	50

At the end of the semester those students who attended tutorials during the last week of classes were asked complete evaluation forms on the tutorial programme. They were specifically asked to comment on their tutors' performance in terms of preparedness, communication skills, enthusiasm and motivation, as well as their ability to interact with the students during the tutorial session. Tables 6 and 7 provide some feedback on the results of this survey.

Table 6 indicates the feedback on the tutors, by gender. In most cases, male tutors seem to receive stronger positive feedback than female tutors. For example, on the question of whether tutors applied interactive strategies to encourage questions and/or participation, almost 92% of the students agreed with this statement in the case of male tutors, as opposed to only 82% in the case of female tutors. Another important aspect was the tutors' enthusiasm about the content of the module. Once again students were in agreement that male tutors were more enthusiastic (85% of the students agreed with this statement while 79% of the students with female tutors agreed with this statement.

Table 6: Student feedback on tutors, by gender

The tutor:	Gender of Tutor	Agree	Disagree
usually started on time with the tutorials and appointments.	Male	96.17%	1.21%
	Female	93.42%	1.71%
applied interactive strategies and encouraged questions / participation.	Male	91.52%	1.41%
	Female	81.66%	3.44%
made it easy for me to participate in discussions.	Male	81.98%	3.04%
	Female	74.78%	6.38%
is enthusiastic about the study material that is offered in this module.	Male	84.55%	2.23%
	Female	78.96%	4.61%
is well prepared for tutorial sessions / practicum.	Male	90.89%	2.02%
	Female	89.65%	2.58%
appears to have a good general knowledge in the subject.	Male	94.57%	1.41%
	Female	90.83%	3.16%
communicates clearly (orally, in writing and electronically).	Male	80.24%	5.45%
	Female	79.31%	8.91%
is accessible to learners.	Male	83.61%	2.07%
	Female	79.42%	4.64%
is professional and enhances the image of the department.	Male	91.26%	1.42%
	Female	84.44%	3.17%
checked on a regular basis whether I have worked out the tutorial questions.	Male	55.90%	21.75%
	Female	48.41%	20.17%
stimulates me to work beyond the requirements of the module.	Male	62.57%	11.65%
	Female	57.10%	12.18%
helps students to overcome difficulties understanding the problems set.	Male	84.70%	1.43%
	Female	77.16%	5.49%
motivated me to do my best work.	Male	63.89%	9.53%
	Female	55.24%	10.18%
increased my motivation by building my confidence.	Male	59.33%	11.53%
	Female	48.04%	14.71%

Table 7 provides information on the students' feedback on the tutors, by tutors' experience. In general, the feedback is similar between the two categories. Almost none of the questions asked received significantly different responses for experienced tutors, as compared to inexperienced tutors.

Table 7: Student feedback on tutors, by experience

The tutor:	Tutor with:	Agree	Disagree
usually started on time with the tutorials and appointments.	With experience	94%	1%
	No experience	95%	1%
applied interactive strategies and encouraged questions / participation.	With experience	88%	1%
	No experience	86%	3%
made it easy for me to participate in discussions.	With experience	78%	3%
	No experience	78%	5%
is enthusiastic about the study material that is offered in this module.	With experience	81%	3%
	No experience	83%	2%
is well prepared for tutorial sessions / practicum.	With experience	89%	2%
	No experience	91%	3%
appears to have a good general knowledge in the subject.	With experience	92%	2%
	No experience	94%	2%
communicates clearly (orally, in writing and electronically).	With experience	75%	9%
	No experience	84%	4%
is accessible to learners.	With experience	82%	4%
	No experience	81%	3%
is professional and enhances the image of the department.	With experience	87%	2%
	No experience	89%	2%
checked on a regular basis whether I have worked out the tutorial questions.	With experience	47%	23%
	No experience	58%	20%
stimulates me to work beyond the requirements of the module.	With experience	59%	13%
	No experience	61%	12%
helps students to overcome difficulties understanding the problems set.	With experience	81%	4%
	No experience	84%	3%
motivated me to do my best work.	With experience	59%	11%
	No experience	61%	9%
increased my motivation by building my confidence.	With experience	53%	14%
	No experience	55%	13%

Table 8 indicates the academic performance of the ECO114 students who attended more than 4 tutorials. 66% of those students who did not qualify to write the examination or dropped out (and therefore had no final mark) attended five or more tutorials. There is a noticeable increase in the proportion of students who attended more than four tutorials, as the academic performance of the students improves (moving from a fail to pass).

Table 8: Distribution of Economics 114 final marks

Eco114 final mark categories	Frequency	%	Attended 5 or more tutorials
Did not qualify / Dropped out	284	16.84	66%
Fail: 0%-49%	276	16.37	67%
Pass: 50%-54%	412	24.44	68%
Pass: 55%-59%	167	9.91	69%
Pass: 60%-69%	261	15.48	72%
Pass: 70%-100%	286	16.96	74%

4.3 Methodology

The dependent variable in the regression analyses is the course mark obtained by the student. The decision to use the course mark stems from the fact that ECO114 students must qualify to write the examination.⁴ If the final mark is used, some student will effectively be excluded from the regression analysis, causing a sampling bias problem. To avoid this situation, the course mark is used as a proxy for the students' academic performance.

An imputed course mark had to be calculated for 146 students, who received an incomplete course mark. Twenty of these students were excluded since they did not complete any tests during the module. Therefore, no course mark could be imputed for them.⁵ For the remaining students, an imputed course mark was calculated: for students who only wrote one test, the result of this test was used as a proxy for the other test they had not taken. The course mark was then calculated given these test marks, using the same weights as in the calculation for the rest of the students.

Table 9 provides summary statistics on the variables used in the regression analyses. The table indicates three sets of data; summary statistics for all students in the ECO114 module attending tutorials, those attending on a voluntary basis, and students attending on a compulsory basis.

⁴ As mentioned in section 3, ECO114 students must obtain a course mark of at least 40% to qualify to write the examination. In addition, some students are disqualified if they do not complete a minimum number of compulsory tutorials and the required e-learning tests.

⁵ This represents only 1.2% of the total sample of 1685 students who attended tutorials.

Table 9: Summary statistics of variables in regression analyses

Variable	All students attending tutorials			Voluntary attendance			Compulsory attendance		
	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Course mark (%)	1681	56.31	15.88	1009	65.05	12.44	672	43.18	10.53
Tutorial attendance (maximum of 11 tutorials)	1685	6.46	2.95	1009	6.50	3.25	676	6.39	2.45
Lecture attendance (maximum of 5 roll calls taken)	1685	3.49	1.60	1009	3.86	1.40	676	2.94	1.73
Mm (male tutor, male student) interaction dummy	1685	0.30	0.46	1009	0.30	0.46	676	0.30	0.46
Mf (male tutor, female student) interaction dummy	1685	0.26	0.44	1009	0.28	0.45	676	0.25	0.43
Fm (female tutor, male student) interaction dummy	1685	0.23	0.42	1009	0.22	0.41	676	0.25	0.44
Ff (female tutor, female student) interaction dummy	1685	0.20	0.40	1009	0.20	0.40	676	0.19	0.40
Tutor has experience dummy	1685	0.47	0.50	1009	0.48	0.50	676	0.46	0.50
Tutor is postgraduate dummy	1685	0.81	0.39	1009	0.80	0.40	676	0.83	0.38
Commerce faculty	1642	0.87	0.34	988	0.86	0.34	654	0.87	0.33
Arts faculty	1642	0.09	0.29	988	0.10	0.29	654	0.09	0.28
University residence	1678	0.49	0.50	1004	0.54	0.50	674	0.41	0.49
Age	1678	18.73	1.36	1004	18.71	1.22	674	18.75	1.54
Age2	1678	352.47	65.59	1004	351.48	52.10	674	353.96	81.67
Race dummy (white = 1)	1678	0.81	0.39	1004	0.86	0.35	674	0.75	0.43
Matric mark	1652	76.21	11.73	991	80.55	11.66	661	69.70	8.32
School subject dummy: Mathematics	1680	0.64	0.48	1006	0.75	0.43	674	0.49	0.50
School subject dummy: Afrikaans 1st language	1680	0.61	0.49	1006	0.63	0.48	674	0.58	0.49
School subject dummy: Economics	1680	0.19	0.39	1006	0.18	0.38	674	0.21	0.41

The regression analysis applies Ordinary Least Squares (OLS). Robust regressions are used to counter for the problem of heteroscedasticity in the data.⁶ The data for tutorial attendance contain three groups (no attendance, compulsory attendance and voluntary attendance – see discussion above). The focus of the regression analysis is on the last group, i.e. students who attended tutorials on a voluntary basis. This decision is based on preliminary analyses of the relationship between the dependent variable (imputed course mark) and tutorial attendance. Figures 1 to 3 indicate the latter. It is apparent from Figure 1 that tutorial attendance for compulsory students are somewhat non-linearly related to the course mark. However, this is not the case for students attending on a voluntary basis, see Figure 2. The latter reflects a more linear relationship; therefore, the explanatory variable for tutorial attendance will be used in linear form in this regression.

⁶ A Breusch-Pagan test was done on the regression model for all students attending tutorials, and it revealed the following result: $\chi^2(1) = 15.17$ with Prob > $\chi^2 = 0.0001$. The assumption of constant variance can be rejected, hence the use of robust regressions.

Figure 1: Box plot of course mark over compulsory tutorial attendance

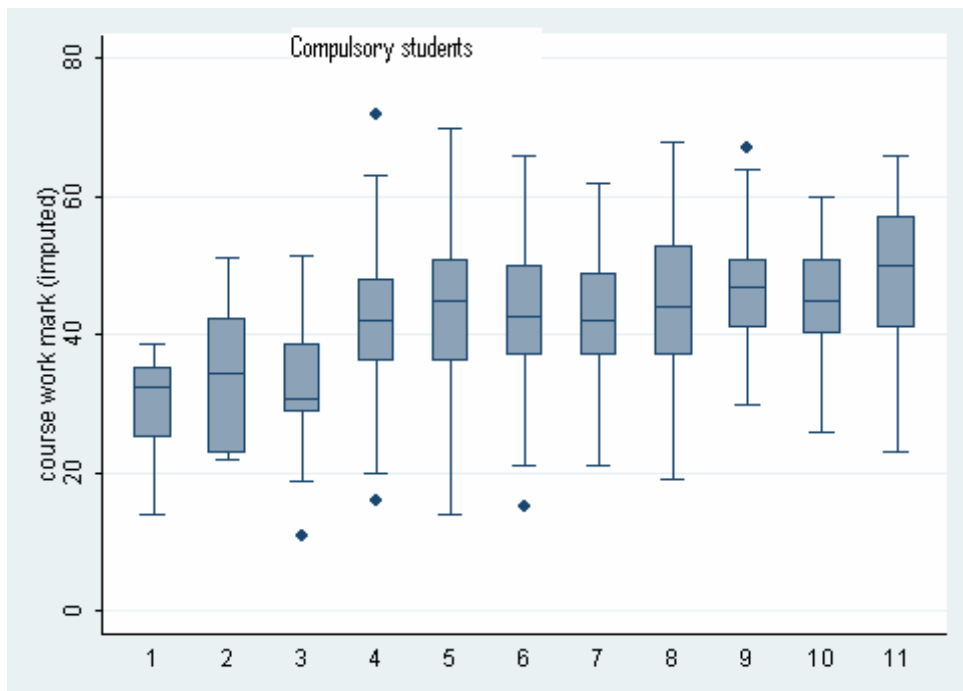


Figure 2: Box plot of course mark over voluntary tutorial attendance

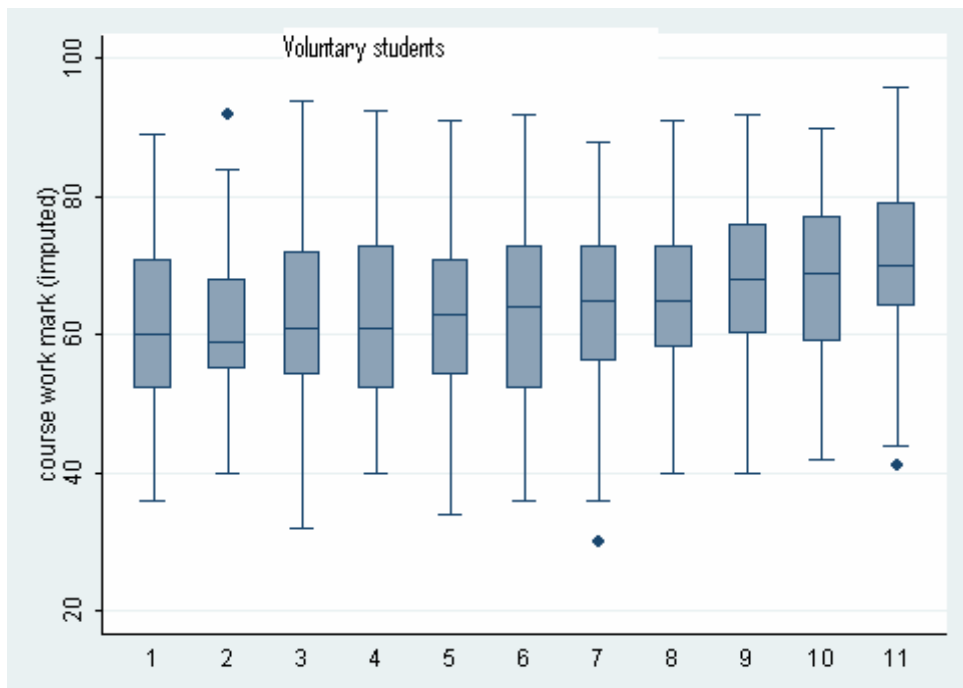


Figure 3: Box plot of course mark over all students' tutorial attendance

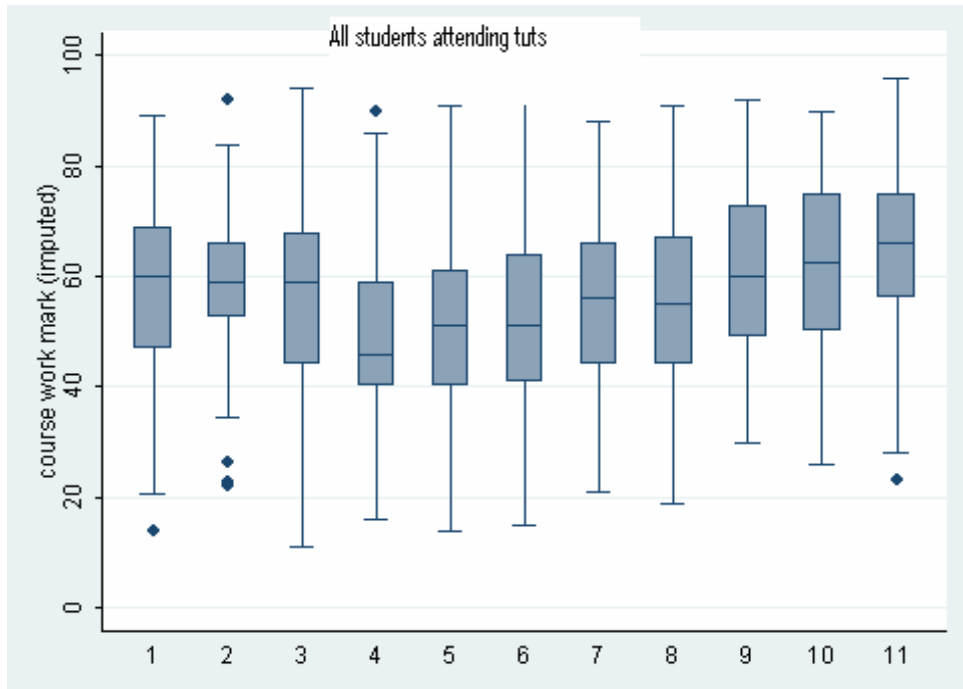


Figure 3 indicates the relationship for all students attending tutorials. It is obvious that combining voluntary and compulsory attendance brings about a non-linear relationship between the course mark and tutorial attendance, hence the decision to separate the regression analysis and to focus on the group who attended on a voluntary basis. Regressions for all students, all students attending tutorials and the compulsory group are included in the appendix (see Figures A.2 and A.3).

5 Results

The econometric models investigate which of the explanatory variables has a statistically significant influence on the course mark of ECO114 students. Table 10 reflects the results for students attending tutorials voluntarily.

Table 10: OLS regression on imputed ECO114 course mark for students attending voluntarily

Explanatory variables	
Tutorial attendance	0.2499
	[2.40]**
Lecture attendance	1.1245
	[4.40]***
Mm (male tutor, male student)	6.1961
	[6.63]***
Mf (male tutor, female student)	2.6962
	[2.92]***
Fm (female tutor, male student)	2.9064
	[3.13]***
Tutor has experience dummy	0.1167
	[0.20]
Tutor is postgraduate dummy	-1.9694
	[2.11]**
Commerce faculty	5.2192
	[3.86]***
Arts faculty	2.7345
	[1.67]*
University residence	-1.7521
	[2.80]***
Age	3.2013
	[1.57]
Age2	-0.0497
	[1.06]
Race dummy (white = 1)	1.4944
	[1.75]*
Matric mark	0.6844
	[22.38]***
School subject dummy: Mathematics	1.8715
	[2.45]**
School subject dummy: Afrikaans 1st language	-1.7418
	[2.60]***
School subject dummy: Economics	0.5854
	[0.72]
Constant	-45.6446
	[2.06]**
Observations	971
R-squared	0.48

Absolute value of t statistics in brackets. *** Significant at 1% ** Significant at 5% * Significant at 10%

Both lecture and tutorial attendance are positive and statistically significant for students attending tutorials on a voluntary basis. The coefficient for lecture attendance is greater than that of tutorial attendance, indicating that lectures are relatively more important to students' performance. The results are supported by existing literature (see Van Walbeek

2004; Horn & Jansen 2008; Romer 1993.) in which studies have shown the positive significance of lecture and tutorial attendance.

With regards to the gender of the tutor, all three of the tutor-student interaction dummies have a positive coefficient and are significant. The findings prove that, in economics, male students fare relatively better than female students. More importantly, the results reflect that male students perform relatively better with male rather than female tutors. This result is opposite to what was found by Butler and Christensen (2003). In their study male students with female tutors performed better than all the other combinations. A possible explanation for this finding is that males (in economics as a discipline) generally tend to fare better than females. It is also the case that when the gender of the tutor and the student is the same, these students tend to perform better, (see Keri 2002). There could be two potential reasons for this, namely that students pay more attention to male tutors as they perceive males to be more knowledgeable, as was also indicated by Midler and Chamberlin (2000). Another reason is provided by Keri (2002), namely that tutors instruct the same gender better because they understand the learning process of their own gender., which can be seen in the findings (male students who attend the tutorials of male tutors outperform the male students who attend the tutorials of female tutors).

In an effort to separate the effect of the tutor from the gender of the student, another regression was run using a dummy for male tutor, and including a gender dummy for the male student. The results are shown in table A.1 (appendix). The former indicates that students who attended the tutorial classes of male tutors, controlling for other factors, performed significantly better than students who attended the classes of female tutors. In the case of male student dummy, it once again shows that male students perform relatively better than female students.

The tutor experience dummy indicates whether a tutor has experience in tutoring (i.e. has tutored before, either in economics or another discipline). The results indicate no significant finding for tutors with experience having a more profound impact on students, as compared to tutors without experience. This finding is supported by Alaie (2008) who found that tutors with a lack of experience were considered better teachers by their students. These students also performed as well as those students who were tutored by experienced tutors. A strange result, however, is the finding on the significance of whether the tutor is a

postgraduate student or not. This dummy indicates that students who attended postgraduate tutors' classes, perform relatively worse than those who attended the undergraduate tutors' classes. It must be kept in mind that there were very few undergraduate tutors included in the study, which may influence the result. It is possible that students feel even more comfortable with a tutor who more recently experienced the first-year module, and can relate better to them. However, this result may require further investigation.

Contrary to expectations, students living in the university residences perform relatively worse than students living in private accommodation or with their families. Usually one would expect that students living on campus will perform better since they save time by not having to commute to campus. These students also have more access to learning and study facilities, and increased interaction with their peers. The faculty dummies show that students from Commerce and Arts perform relatively better than students from other faculties (such as Agriculture and Law).

Table 10 also indicates that White students perform relatively better than non-White students, after controlling for other factors that influence the student's academic performance. The age variable indicates that older students perform better, although, the negative sign of the variable age squared (age^2) indicates a non-linear relationship between age and the course mark. This shows that the real older students in the module do perform relatively weaker. However, for the group of students attending tutorials on a voluntary basis, these results are not significant.⁷

Regarding the student's school performance, the aggregate mark obtain in the school-leaving examination (matric) is positively related to academic performance and is significant. This result has been proven in many previous studies (see Siegfried and Fels, 1979; Edwards, 2000, Stanca, 2006). The matriculation subject dummies for some of the school subjects show mixed results. Economics is not significant, indicating that students who had done economics at school generally do not fare better than students who did not take economics at school. The dummy for Mathematics has a positive coefficient and is significant, as found

⁷ In a regression which only includes age as an explanatory variable, the age of the student is positively (and significantly) related to academic performance.

by other studies (see Siegfried and Fels, 1979; Edwards, 2000; Van Walbeek, 2004; Parker 2006). Another interesting result is that students who had taken Afrikaans first language (higher grade) at school tend to perform relatively worse than students who did not do Afrikaans higher grade. This result is puzzling since SU is traditionally an Afrikaans university and one would expect Afrikaans-speaking students to feel more comfortable relative to students with other languages as their mother tongue. It should be kept in mind, however, that although students receive instruction in both English and Afrikaans (and all class notes and other materials are in both Afrikaans and English), the textbook is only in English. This might possibly have some effect and is similar to a finding by Horn and Jansen (2008) at the same institution. However, as also indicated in that study, this is not a proven reason for the finding and warrants further analysis.

A comparison of the regression results for voluntary and compulsory tutorial attendance can be found in the appendix (table A.2). The results for the regression of compulsory tutorial attendance indicate that tutorial attendance is positively (and significantly) related to the course mark. In a further regression (not shown in the appendix), assuming a non-linear relationship between the course mark and tutorial attendance, the variables tutorial attendance, tutorial attendance squared and tutorial attendance cubed, are all significant. This proves the relationship shown in Figure 1. Of further relevance to the investigation, compared to students who attended on a voluntary basis, the tutor student interaction dummies are no longer significant. Whether the tutor is a postgraduate student or not, is no longer significant. The variable age and age squared are also both significant.

6 Concluding remarks

First-year economics modules generally include tutorial programmes, which form an integral part of the academic support offered to especially underperforming students. It is therefore crucial to assess the impact of tutorial programmes on the academic performance of students. In an effort to control for factors that have been proven by the literature to affect academic performance, the regression analyses included variables such as the gender of the student, age, school-leaving results and lecture attendance. As expected, these explanatory variables remain significant. The main focus, however, was on the impact of tutorial programmes, in particular the gender of tutors and their level of experience. The findings indicate that, in the case of students attending tutorials voluntarily, male tutors seem to

outperform female tutors (in terms of their impact on student performance). This is different to the findings of other studies in the existing literature. However, this kind of study has (to the authors' knowledge) never been undertaken in the field of economics, which may be one of the reasons for the different result.

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8 Appendixes

Table A.1: OLS regression on imputed ECO114 course mark for students attending tutorials voluntarily

Explanatory variables	
Tutorial attendance	0.2412
	[2.33]**
Lecture attendance	1.119
	[4.37]***
Male tutor dummy	3.0188
	[3.93]***
Male student dummy	3.2443
	[5.46]***
Tutor has experience dummy	0.0996
	[0.17]
Tutor is postgraduate dummy	-1.9797
	[2.12]**
Commerce faculty	5.2449
	[3.90]***
Arts faculty	2.8082
	[1.73]*
University residence	-1.7608
	[2.82]***
Age	1.0773
	[3.77]***
Race dummy (white = 1)	1.5818
	[1.82]*
Matric mark	0.6838
	[22.41]***
School subject dummy: Mathematics	1.8527
	[2.42]**
School subject dummy: Afrikaans 1st language	-1.7215
	[2.56]**
School subject dummy: Economics	0.5319
	[0.65]
Constant	-23.491
	[3.63]***
Observations	971
R-squared	0.48

Absolute value of t statistics in brackets. *** Significant at 1% ** Significant at 5% * Significant at 10%

Table A.2: OLS regression on imputed ECO114 course mark for students attending tutorials on a compulsory basis

Explanatory variables	Compulsory attendance	Voluntary attendance
Tutorial attendance	0.7985	0.2499
	[4.09]***	[2.40]**
Lecture attendance	0.6421	1.1245
	[2.28]**	[4.40]***
Mm (male tutor, male student)	1.3012	6.1961
	[1.10]	[6.63]***
Mf (male tutor, female student)	-0.4436	2.6962
	[0.37]	[2.92]***
Fm (female tutor, male student)	1.5134	2.9064
	[1.33]	[3.13]***
Tutor has experience dummy	0.1682	0.1167
	[0.23]	[0.20]
Tutor is postgraduate dummy	0.37	-1.9694
	[0.31]	[2.11]**
Commerce faculty	3.6964	5.2192
	[2.23]**	[3.86]***
Arts faculty	1.3352	2.7345
	[0.69]	[1.67]*
University residence	-0.2292	-1.7521
	[0.29]	[2.80]***
Age	5.0989	3.2013
	[4.75]***	[1.57]
Age2	-0.0807	-0.0497
	[4.41]***	[1.06]
Race dummy (white = 1)	2.4871	1.4944
	[2.68]***	[1.75]*
Matric mark	0.4218	0.6844
	[8.82]***	[22.38]***
School subject dummy: Mathematics	3.0846	1.8715
	[4.11]***	[2.45]**
School subject dummy: Afrikaans 1st language	0.787	-1.7418
	[0.95]	[2.60]***
School subject dummy: Economics	0.3451	0.5854
	[0.37]	[0.72]
Constant	-68.2693	-45.6446
	[4.65]***	[2.06]**
Observations	636	971
R-squared	0.27	0.48

Absolute value of t statistics in brackets. *** Significant at 1% ** Significant at 5% * Significant at 10%

Table A.3: OLS regressions on imputed ECO114 course mark for all students, and all students attending tutorials

Explanatory variables	All students	All students attending tutorials
Tutorial attendance	-3.0857	-3.9615
	[5.70]***	[3.34]***
Tutorial attendance squared	0.4173	0.5714
	[3.28]***	[2.65]***
Tutorial attendance cubed	-0.015	-0.0236
	[1.93]*	[2.05]**
Lecture attendance	1.7252	1.9197
	[9.68]***	[8.88]***
Mm (male tutor, male student)	--	4.9811
	--	[5.99]***
Mf (male tutor, female student)	--	1.5344
	--	[1.81]*
Fm (female tutor, male student)	--	3.1054
	--	[3.80]***
Tutor has experience dummy	--	0.7922
	--	[1.48]
Tutor is postgraduate dummy	--	-1.9911
	--	[2.41]**
Commerce faculty	4.0569	5.1225
	[3.84]***	[4.21]***
Arts faculty	1.5447	2.769
	[1.19]	[1.87]*
University residence	-0.8388	-1.2919
	[1.64]	[2.28]**
Age	4.9261	5.2764
	[6.80]***	[6.78]***
Age2	-0.0784	-0.0832
	[5.97]***	[6.12]***
Race dummy (white = 1)	1.9321	2.137
	[2.90]***	[2.82]***
Male student dummy	2.7997	--
	[5.59]***	--
Matric mark	0.776	0.8303
	[30.48]***	[29.82]***
School subject dummy: Mathematics	3.7686	3.8251
	[6.67]***	[6.08]***
School subject dummy: Afrikaans 1st language	-1.6709	-1.7534
	[3.08]***	[2.79]***
School subject dummy: Economics	0.3211	-0.52
	[0.50]	[0.73]
Constant	-75.6842	-84.411
	[7.76]***	[7.76]***
Observations	1964	1607
R-squared	0.51	0.55

Absolute value of t statistics in brackets. *** Significant at 1% ** Significant at 5% * Significant at 10%