Conference Paper

Is Performance Under the New Matric Curriculum Still Significant in Predicting First Year Academic Success in Economics?

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TIPS

Is performance under the new Matric curriculum still significant in predicting first-year academic success in Economics?[1]

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ABSTRACT

Determining the factors influencing academic success of first-year Economics students in South Africa has been the focus of many local studies in Economic Education. Most of these studies included factors such as Matric results, lecture and tutorial attendance, and demographic information in an attempt to explain the academic performance of the students. In particular, most of the explanatory variables relating to Matric results were good predictors of students' academic success. However, a new Matric curriculum was introduced in 2008. There is no longer a distinction between Higher, Standard and Lower Grades in subjects, and students are compelled to take seven subjects. Given these changes, the question arises as to whether Matric results are still significant in explaining academic ability, and whether the matriculants from the new curriculum perform differently than those from the old curriculum. In addition, fewer local studies included other factors such as the students' time spent on studying outside lectures and work status. The latter factors could play a role in the academic performance of the students.

The purpose of this study is to investigate the academic success of Economics students at the University of the Western Cape (UWC) in 2009. In addition to investigating the relevance of the common explanatory factors (as mentioned above), the impact of the revised Matric curriculum is explored. This is possible since the data contain students who matriculated under both the old and new syllabus. In addition, a survey was conducted during the second semester 2009 to gather more information on possible factors influencing academic performance, such as the students' demographic information, their attitude towards studying Economics, their parents' educational background, and their work status. A two-step Heckman model was used to control for students who enrolled for the course but did not write the examination. The main results are that students matriculating under the new curriculum perform relatively weaker. In addition, students who did not work part-time, and those who spent relatively more time studying outside lectures perform better.

Keywords: Education, Undergraduate, First-year Economics, Academic performance
JEL codes: A2, A22, A29

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1. Introduction

Identifying the factors determining the academic success of first-year Economics students has received much attention in the international and local economic education literature. The research objectives for the diverse range of studies include overall predicting factors determining academic success, to focusing on specific factors such as class and tutorial attendance, whereas other studies investigate whether academic support programmes contribute to academic performance. These studies have led to a myriad of suggestions and policy implications for students, lecturing staff, academic departments, university authorities, and the government.

Many studies use the education production function approach as an appropriate methodology for their econometric estimations. This approach is highlighted by Siegfried and Fels (1979: 925), who grouped the literature on teaching methods and techniques into a production function approach. This type of analysis investigates how output (which can be measured in terms of results achieved in examinations or student evaluation questionnaires) can be explained by a diverse number of inputs. These range from student human capital (measured in terms of college entrance exam scores, or prior knowledge of economics), and faculty human capital (the experience of instructors), to college environment (which specifically looks at the impact of class size), and student effort (such as the amount of study time). Siegfried and Fels (1979: 948) include other inputs such as the role of graduate student instructors, whom it has been found, may have a bigger positive impact on student performance since they are still very enthusiastic and have a better rapport with the students, as compared to regular faculty staff.

In many studies, the measurable output for student performance has been the test or examination performance of Economics students. Van Walbeek (2004), in his investigation of the impact of lecture attendance on student performance, uses the final examination mark of the student as dependent variable. His analysis includes a more detailed breakdown of measurable output, by looking at the students' performance in multiple choice questions separately from the essay component. Pretorius, Prinsloo and Uys (2007) use the final mark in their study to measure student performance. They investigate the factors influencing the success of introductory microeconomic students, within an open and distance learning module context. In another recent study by Andrietti, D'Addazio and Gómex (2008) in which they investigate the impact of class attendance on student performance, the exam score is used as the output variable.

The explanatory variables used to predict student performance have been based on previous studies. One of the earlier studies focusing on class attendance as an important predictor of academic success is Romer (1993). Some of the more pertinent questions addressed in this paper is whether absenteeism from lectures is a cause of concern and whether something should be done about it. His findings reflect a positive effect of class attendance on student performance, after controlling for student effort and ability. In addition, Romer addresses the issues of mandatory attendance by suggesting that experiments should be conducted that investigates whether a mandatory attendance policy will be effective.

More recent studies investigating the impact of class attendance find similar results. Van Walbeek (2004), after controlling for student ability (university entry points) and other demographic factors (such as age, gender and race), finds that lecture attendance does matter for student performance. Using a panel data set, Stanca (2006) investigates the effect of attendance on performance, accounting specifically for the impact of effort, ability and motivation. He specifically points to the endogeneity problem when considering class attendance as a predictor of student performance. Since students has the choice of attending lectures, class attendance is not an exogenous independent

variable, leading to biased and inconsistent results when using Ordinary Least Squares (OLS). Stanca (2006: 252) indicates that many authors have tried to circumvent this problem by including proxy variables in the OLS regression, which control for ability, effort and motivation. His approach in this study however, is to additionally use an instrumental variable approach, as well as panel data methods. His findings show that there is a positive and significant relationship between attendance and student performance. Andrietti *et al.* (2008) point to the same issue of endogeneity, and also use a proxy variables and the instrumental variable approach with instruments such as distance from campus and being employed for attendance. They find a significant impact of attendance on performance; although they indicate data problems (cross-sectional data are used) render their instruments less effective. In addition to considering class attendance, tutorial attendance is another factor considered as a possible predictor of student performance. Horn and Jansen (2009), after using certain variables to control for motivation and ability (such as Matric examination performance and class attendance) find that students who attend more tutorials tend to improve their academic performance.

Another important factor to consider in explaining student performance is the actions of the students outside the classroom. Okpala, Okpala and Ellis (2000: 222) investigate the impact of study time and study habits/strategies (i.e. not having excessive contact with friends while studying, studying the important points, and following a study schedule), and find that the latter has a positive significant impact on the course grade. Moreover, another important consideration is the impact of part-time work status on academic performance. Kottasz (2005), in a study analysing the reasons for non-attendance of lectures and tutorials, alludes to the possibility of casual work as one possible reason for poor attendance rates. However, her findings indicate that in both cases, having work commitments is not a major factor in explaining tutorial and lecture attendance. In contrast, Carney, McNeish, and McColl (2005) investigate the impact of part-time employment on the health and academic performance of students at a Scottish university. They use a survey questionnaire which includes questions on employment, the reasons for working, as well as the perceived effects on academic performance (Carney, at al. (2005: 309)). Their analysis shows that students who worked more hours had a bigger probability of perceiving that working had an effect on their studies.

When considering the academic ability of students, most studies use some proxy variable such as the student's performance at school. In the case of USA studies, the students' grade point average or the performance in the scholastic aptitude tests are used (see Okpala *et al.* (2000)). Local studies (such as Van Walbeek (2004) and Smith (2009)) make use of the results from the last school examination, i.e. the Matriculation[2] examination results. In most local studies, the Matric results contributed positively and significantly to academic performance in Economics (Van Walbeek (2004), Parker (2006) and Smith and Edwards (2007)). In addition, the significance of school results has taken on a further dimension with the recent change in the South African Matric curriculum. As from 2008, the National Curriculum Statement (NCS) requires learners in Grades 10 to 12 to do seven subjects (Western Cape Education Department (2006)). Four subjects are compulsory, which include two languages, either Mathematics or Mathematical Literacy, and Life Orientation. In addition, there is no longer a distinction between Higher Grade (HG), Standard Grade (SG) and Lower Grade (LG). One study investigates the ability of the NCS Mathematics to signal performance, as compared to the Senior Certificate (SC) Higher Grade Mathematics (Hunt *et al.* (2009)). Their paper tests whether students who matriculated before and after 2007 perform significantly different in two Commerce subjects at the University of the Witwaterstrand. Their findings suggest that the Matric Mathematics results for students who matriculated after 2007 is a weaker signal of their ability to cope at university.

[2] From this point onwards, it is referred to as Matric.

As indicated earlier, extensive research has been done in an attempt to identify the relevant predictors of academic performance for students studying at South African universities. These studies, in addition to the international literature, have identified substantial information on the key factors that play a role in achieving success, especially in the first year of study. However, some factors remain unexplored in the local literature, in particular the influence of part-time work, the study characteristics of students outside the classroom (such study habits and hours spent on the subject), as well as the impact of using an English textbook where the student's home language is different. At the University of the Western Cape (UWC) in South Africa, some of these factors are relatively important since students use part-time employment to finance their studies. In addition, the home language of many students at UWC is not English. In the event of having to study in another language, the question arises as to whether using an English textbook has any effect on academic performance. Stephen, Welman and Jordaan (2004) investigate English language proficiency as a predictor of academic success at another South African university, and find that Black students perform relatively worse as compared to their Indian counterparts, with the latter exhibiting higher English proficiency levels.

Given this background, this study investigates the relevance of these factors in explaining academic success for a first-year Economics course at UWC. In addition to using student information obtained from university records (i.e. student course marks, Matriculation information, lecture and tutorial attendance records), data obtained from a survey questionnaire is also added. The latter provides more comprehensive information on the study habits of students, their part-time work status, and their level of interest in Economics. The outline of the paper is as follows: Section 2 introduces the new one-semester Economics modules at UWC. This is followed by Section 3, which presents a descriptive statistical analysis of the data used in the study. Section 4 discusses the main findings of the student survey which took place towards the end of the second semester of 2009. Section 5 analyzes the ECO 134 year mark and final mark, before Section 6 looks at the econometric models and results. Section 7 concludes the paper.

2. An overview of curriculum and course design in the Faculty of Commerce

2.1 A description of the new curriculum at the Faculty of Commerce in 2009

The Commerce Faculty at UWC adopted curriculum changes to their degree courses in 2009. This coincided with the change of the matriculation syllabus to Outcomes Based Education (OBE) from the old National Senior Certificate (NSC) qualification. Admissions criteria were necessarily revised with new point allocations being adopted in lieu of the former higher grade (HG) and standard grade (SG) categories.

In 2009, the following six bachelor degree programs were offered to the full-time students: (1): BCom (General), 3-year full-time; (2): BCom (General), 4-year full-time[3]; (3): BCom (Accounting), 3-year full-time; (4): BCom (Accounting), 4-year full-time[4]; (5): BCom (Law), 3-year full-time; (6): BAdmin, 3-year full-time.

The admission requirements for all the programs above were that, the students obtained the National Senior Certificate for Bachelor's Degree study plus a score of no less than 27 points calculated according to the university's approved points system (University of the Western Cape, 2010),[5] as well as specific subject requirements, which are presented in Table 1 below.

The new curriculum design was created with the intent of re-enforcing crucial literacy and numeracy skills (i.e., the foundation modules), followed by the core and elective modules. The students enrolling for a 3-year program must complete the foundation modules in the first semester of 2009, before they could enroll for the core and elective modules in the second semester. On the other hand, the students enrolling from the 4-year program must have completed the foundation modules in 2008, before being allowed to register the core and elective modules from the first semester of 2009.

[3] Such four-year program, known as extended curriculum by UWC, is offered to the students with lower entrance criteria (Refer to Table 1).

[4] Refer to footnote 3.

[5] A declining scale was used to award points for each symbol obtained. 7 points were awarded for an A symbol (80%-100%), 6 points for B (70%-79%), 5 points for C (60%-69%) and so forth. The maximum total approved points awarded for 7 subjects would be 49 points. On the other hand, under the old Matric syllabus, a declining scale was also used to award points for each symbol obtained. If the subject was taken on Higher Grade, 8 points were awarded for an A symbol, 7 points for B, and so forth. For Standard Grade, 6 points were award for an A symbol, 5 points for B, and so forth. Students who obtain a G symbol were not awarded any points, regardless of the grade.

Table 1: Specific subject requirements in each program offered by the Faculty of Commerce

Program	Specific subject requirements	Program	Specific subject requirements
BCom (General), 3-year full-time	• 50%-59% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 50%-59% in Mathematics or 60%-69% in Mathematical Literacy[6]	BCom (General), 4-year full-time	• 40%-49% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 40%-49% in Mathematics or 60%-69% in Mathematical Literacy
BCom (Accounting), 3-year full-time	• 50%-59% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 50%-59% in Mathematics • 60%-69% in Accounting (not required if the student had 60%-69% in Mathematics)	BCom (Accounting), 4-year full-time	• 40%-49% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 40%-49% in Mathematics • 50%-59% in Accounting (not required if the student had 50%-59% in Mathematics)
BCom (Law), 3-year full-time	• 50%-59% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 50%-59% in Mathematics	BAdmin, 3-year full-time	• 50%-59% in English (home or first additional language) • 40%-49% in another language (home or first additional language) • 40%-49% in Mathematics or 50%-59% in Mathematical Literacy

Source: University of the Western Cape (2010)

2.2 A description of the first-year Economics modules offered in 2009

Based on such curriculum design as discussed in Section 2.1, the Department of Economics offers three first-year, semesterized modules, namely ECO133, ECO134 and ECO135. The ECO133 and ECO134 modules, which stand for the principles of Economics, have the same content and include the core Economic theories, i.e. Microeconomics and Macroeconomics[7]. Furthermore, ECO135, Introductory Mathematical Economics, was still an optional module in 2009.

ECO133 and ECO134 are presented in the first and second semesters respectively, with ECO133 primarily serving students from the 4-year full-time programs and BCom 4-year part-time program[8], while ECO134 for the students from the 3-year full-time programs. Finally, students who failed ECO133 in the first semester are allowed to register for ECO134 in the second semester of the same year, while students who failed ECO134 in the second semester are allowed to register for ECO133

[6] The University's 2010 Admissions Requirements were further revised to exclude Mathematical Literacy from the selected criteria.

[7] Table A.1 of the Appendix I compares the curriculum of the ECO133/134 module with the first-year Microeconomics (ECO114) and Macroeconomics (ECO144) modules at Stellenbosch University. At the latter institution, Microeconomics and Macroeconomics are offered in the first and second semesters respectively. This was also the first-year Economics curriculum at UWC until 2008, i.e., Microeconomics (ECO111) and Macroeconomics (ECO121) were offered in each semester. These two modules were offered for the last time in 2009, but only for students who failed these two modules from the previous years.

[8] The students from the part-time program are excluded from the analyses in this paper.

in the first semester of the following year. This paper focuses on the ECO134 students in the second semester of 2009.

With regard to ECO134, there were fourteen lecture weeks, comprising of three one-hour weekly periods. Students also attended weekly tutorials. There were ten tutorials during this semester. Attendance of both lecture and tutorial sessions were considered compulsory. Furthermore, students had access to additional academic support via online-learning, where they could download course material such as lecture slides and additional readings.

Looking at the tutorial sessions in greater detail, of the ten sessions, students wrote tutorial tests in eight sessions, and the best six results were counted towards the assessment of the module. As far as the latter is concerned, the structure consisted of two term tests, tutorial tests as mentioned above, and an examination. Table 2 shows the calculation of the final mark, with coursework mark and exam mark accounting for 60% and 40% of the final mark respectively. Only students whose coursework mark was at least 40% qualified to write the examination.

Table 2: Calculation of the final mark

	Type of Assessment	**Total Weight**
Coursework mark	Term test 1	20%
	Term test 2	25%
	Tutorial test (best 6)	15% (2.5% per test × 6 tests)
Exam mark	Examination	40%
Final mark	Coursework mark ×60% + exam mark × 40%	100%

Enrolment figures were captured at an initial level of 440 students, but over the course of the semester, 21 students dropped out or chose to de-register, reducing the sample size to 419 students. As a result of insufficient information on the demographic characteristics of 7 students (all of them were foreign students), only the remaining 412 students are included for the forthcoming analyses.

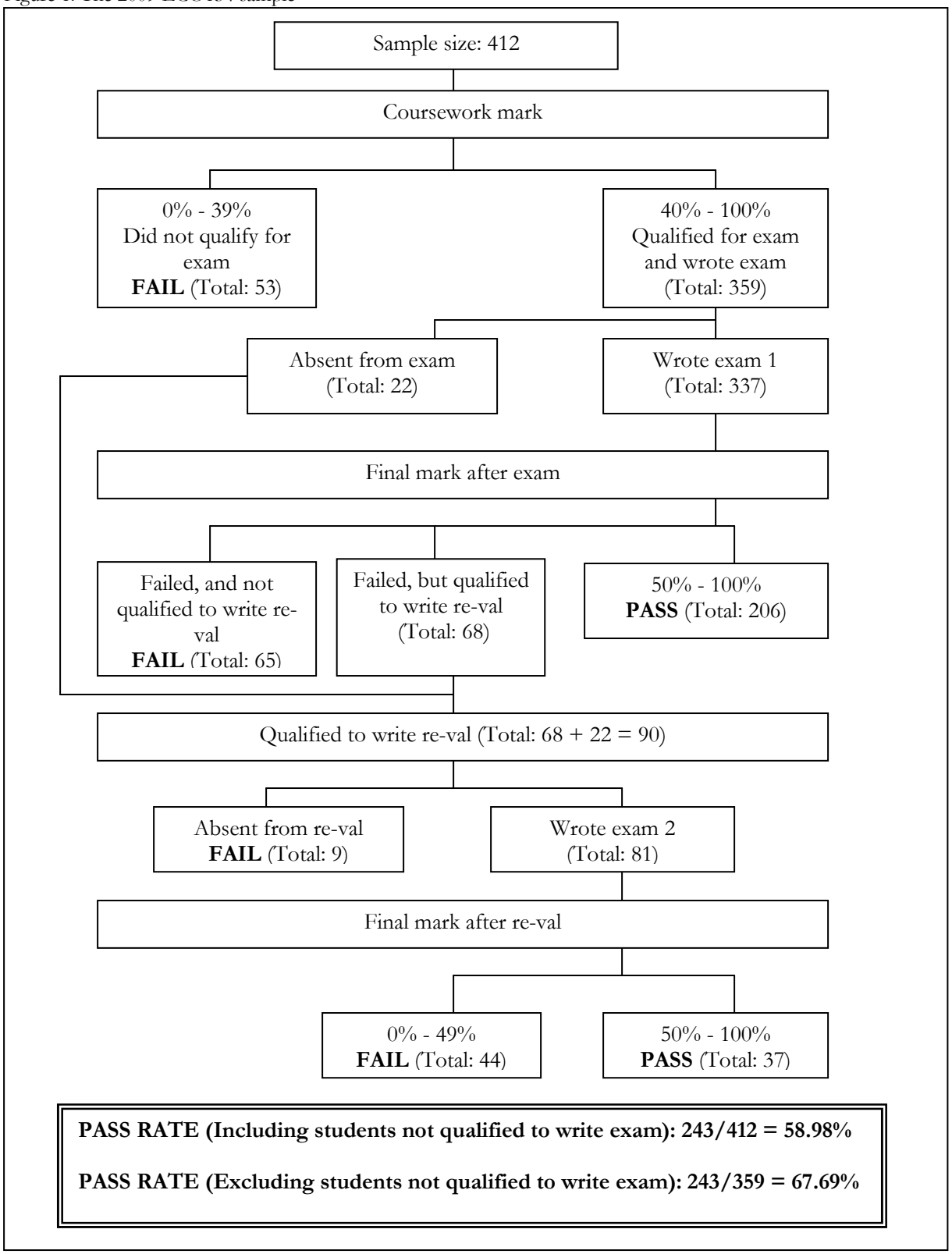
From this final sample of 412 students, 359 obtained a coursework mark of at least 40% and qualified to write the exam. However, 22 did not write the exam, but they were allowed to write the re-valuation, providing they submitted the proof of absence from exam. 337 students wrote the exam and 206 students passed the module (i.e., final mark was at least 50%). Looking at the remaining 131 (337 – 206) students who failed after the exam, 68 qualified to write the re-valuation[9]. In other words, 90 students qualified to write the re-val. Looking at these 90 students, 81 of them wrote the re-val, and 37 of them passed the module after that. Finally, the pass rate of the module was 58.98% if the students who did not qualify to write the exam were included, but 67.69% if they were excluded[10] (see Figure 1).

The next section will present a descriptive analysis on the demographic, educational attainment and study characteristics of the students.

[9] Students with a final mark of 45%-49% after the exam were given permission to write the re-valuation. In addition, students whose final mark was 40%-44% after the exam were also allowed to write the re-valuation, providing the coursework mark and exam mark were at least 50% and 30% respectively.

[10] Figure A.1 of the Appendix I provides the information on the pass rates of ECO111, ECO121, ECO133 and ECO134 since 2004 by adopting such approach.

Figure 1: The 2009 ECO134 sample



3. Demographic and educational attainment characteristics of the students

3.1 Demographic characteristics

Table 3 presents the demographic characteristics of the students. Over 50% of them are Coloured students, and nearly one-third are Blacks. As far as gender is concerned, the female share is approximately 55%. Looking at the birth year of the students, slightly more than one-third of them were born in 1990 (i.e., turning 19 years in 2009). In addition, marginally more than 20% were born in 1989 (i.e., turning 20 years in 2009) and nearly a quarter were under-aged (born after 1990). Finally, with regard to the province of usual residence, 83.5% of the students usually reside in Western Cape. Note that 2.2% of the students normally reside outside South Africa (i.e., foreign students).

Table 3: Demographic characteristics of the students

Race		
Black	132	32.04%
Coloured	232	56.31%
Indian	42	10.19%
White	6	1.46%
	412	100.00%
Gender		
Male	186	45.15%
Female	226	54.85%
	412	100.00%
Home language		
Afrikaans	59	14.32%
English	241	58.50%
isiXhosa	87	21.12%
Other	25	6.07%
	412	100.00%
Birth year		
1988 or before (i.e., older than 20 years)	74	17.96%
1989 (i.e., aged 20 years)	85	20.63%
1990 (i.e., aged 19 years)	156	37.86%
1991-1992 (i.e., 17-18 years)	97	23.54%
	412	100.00%
Province of usual residence		
Western Cape	344	83.50%
Eastern Cape	33	8.01%
Other provinces	26	6.31%
Outside South Africa	9	2.18%
	412	100.00%

3.2 Matriculation characteristics

The Matriculation characteristics of the ECO134 students are shown in Table 4. More than 55% of them matriculated in 2008 (under the new National Senior Certificate curriculum). In addition,

slightly above 80% matriculated from schools under the Western Cape Education Department. About 60% students wrote exams on 7 subjects[11].

Looking at the Matric subjects in greater detail, approximately two-thirds of the students took Afrikaans first additional language or second language[12]. On the other hand, one-third and more than 75% of the students did Economics and Accounting respectively. Nearly 40% did Physical Science (or both Physics and Chemistry). Finally, just over 50% of the students did Business Economics/Studies.

Table 4: Matriculation subject information of the students

Year of matriculation		
In 2008	233	56.55%
Before 2008	179	43.45%
	412	100.00%
Province of matriculation		
WC	337	81.80%
Other provinces	56	13.59%
Outside South Africa	19	4.61%
	412	100.00%
Number of students doing each subject (n = 412)		
Afrikaans home language (2008) or first language (2007 or before)	55	13.35%
Afrikaans first additional language (2008) or second language (2007 or before)	277	67.23%
Economics	136	33.01%
Accounting	319	77.43%
Computer Science	68	16.50%
Geography	59	14.32%
History	51	12.38%
Biology	113	27.43%
Physical Science	158	38.35%
Business Economics/Studies	210	50.97%
Mathematics		
Mathematics (2008)	196	47.57%
Mathematical literacy (2008)	37	8.98%
Maths HG (2007 or before)	65	15.78%
Maths SG (2007 or before)	110	26.70%
No Matric Maths	4	0.97%
	412	100.00%
English		
Home language (2008)	167	40.53%
First additional language (2008)	66	16.02%
First language (2007 or before)	126	30.58%
Second language (2007 or before)	53	12.86%
	412	100.00%

[11] Looking at the pre-2008 matriculants, 82% of them wrote exams on 6 subjects. However, 95% of the 2008 matriculants wrote exams on 7 subjects. It is because Life Orientation became a compulsory subject since the new Matric curriculum commenced.

[12] As far as the standard of the language subject is concerned, before 2008, the students could take a language subject at any of the following levels: First, second or third language. Furthermore, each at level, there was a Higher Grade (HG) and Standard Grade (SG) distinction. With the introduction of the new Matric curriculum since 2008, the students could take a language subject at any of the following levels: Home language, first additional language, or second additional language.

With regard to the English and Maths subjects, nearly half of the students did Mathematics under the new curriculum in 2008, while nearly 16% did Maths on Higher Grade (HG) before 2008. Slightly below 10% did Mathematical Literacy under the new curriculum. Interestingly, none of the students in the sample did Additional Mathematics at Matriculation. Furthermore, approximately 40% of the students took English home language under the new curriculum, while 30% took English first language under the old curriculum before 2008[13].

3.3 Study characteristics

Table 5 summarizes the study characteristics of the students. 400 out of the 412 students (97.09%) enrolled for a Bachelor Degree from the Faculty of Commerce in 2009, with most of them enrolling for a BCom 3-year degree (40.78%) or BAccounting 3-year degree (31.07%). On the other hand, only 9 students repeated the first-year Economics module (i.e., failing ECO133 in the first semester and enrolling for ECO134 in the second semester). Moreover, nearly 10% of the students also registered the optional Introductory Mathematical Economics module (ECO135) in the second semester.

Tutorial attendances were taken in the 8 sessions where the tests took place, and the results from Table 5 shows that the attendance is very high, as more than three quarters attended at least 6 tutorials. Such higher attendance rate is expected, since tutorial test mark is one of the components of the coursework mark (See Table 2). Finally, with regard to the lecture attendance, three attendances were recorded in the third term and again in the fourth term (i.e., six in total). Surprisingly, the lecture attendance was extremely low, as nearly 45% of the students did not attend any lectures. Only slightly above 20% attended at least five lectures.

Table 5: Brief study characteristics of the ECO134 students

Program		
BCom (3-year)	168	40.78%
BCom (4-year)	40[14]	9.71%
BAcc (3-year)	128	31.07%
BAcc (4-year)	24	5.83%
BAdmin	20	4.85%
BComLaw	20	4.85%
BA / LLB / BSc	12	2.91%
	412	100.00%
Enrolled ECO133 in the first semester		
Yes	9	2.18%
No	403	97.82%
	412	100.00%
Enrolled ECO135 in the second semester		
Yes	39	9.47%
No	373	90.53%
	412	100.00%

[13] Of the 126 students taking English first language in 2007 or before, 122 of them did it on HG. On the other hand, 51 out of the 53 students doing English second language in 2007 or before did it on HG.

[14] As mentioned in Section 2.2, only students from the 3-year program are supposed to enroll for ECO134 in the second semester. However, 9 students failed ECO133 in the first semester and subsequently enrolled for ECO134 in the second semester. In addition, the remaining 31 students did not pass first-year Economics before 2009. However, since they temporarily stopped their studies for a while and only registered as a student again in the second semester of 2009, they could only enroll for ECO134.

Table 5: Continued

Tutorial attendance (minimum: 0, maximum: 8)		
0-5	50	12.38%
6	45	10.92%
7	112	27.18%
8	204	49.51%
	412	100.00%
Lecture attendance (minimum: 0, maximum: 6)		
0	182	44.17%
1	53	12.86%
2	37	8.98%
3	26	6.31%
4	26	6.31%
5	36	8.74%
6	52	12.62%
	412	100.00%

4. The ECO134 student survey

The ECO134 student survey was conducted towards the end of the second semester (see Appendix II). Students voluntarily completed the questionnaire at the end of the second term test. Students also received the questionnaire via e-mail and were requested to complete and return it. Furthermore, in order to boost response rate, the students were notified that an MP3 player would be awarded to three participants of the survey. At the end, 394 students participated, i.e., a response rate of 95.63% was achieved.

Table 6 summarizes the main findings of the surveys. First, more than 70% of the respondents indicated that the highest educational attainment of either parent was Matric or above. Secondly, nearly three quarters of the participants resided with their parents at the time of the survey, and only slightly below 20% stayed at the student residence in the campus.

As far as the students' preparation prior to lectures, only slightly below 30% indicated that they did so. Of the 278 participants who indicated they did not prepare prior to lectures, more than half of them declared that they did not do so because they preferred to revise after lectures. On the other hand, approximately a quarter stated they could still understand the lectures without prior preparation. Some students claimed they did not have time or were too lazy to prepare prior to lectures.

Furthermore, just below one-third of the participants used the lecturers' consultation times, while about 45% joined a study group. In addition, a very high proportion of participants made study notes (87.06%). Moreover, 42.13% of the participants indicated that they planned to enrol second-year Economics in 2010. As far their level of interest and enjoyment in the subject is concerned, approximately 65% of the respondents had an interest (i.e., somewhat or very interested) in Economics and 48% of them enjoyed the subject.

With regard to the work status of the students, 86 out of 394 (20%) of the participants indicated they worked part-time at the time of the survey, with nearly half of them stating the part-time work affected their studies negatively. Most of these students claimed they felt stressed to study as a result of the part-time work commitment.

Table 6: ECO134 student survey – main findings

Highest education of either parent		
No schooling	2	0.51%
Incomplete primary (Grade 1 – Grade 6)	15	3.81%
Incomplete secondary (Grade 7 – Grade 11)	65	16.50%
Matric	110	27.92%
Matric + Certificate/Diploma	99	25.13%
Degree	83	21.07%
Don't know	20	5.08%
	394	100.00%
Residence status		
Student residence	73	18.53%
Private residence	28	7.11%
Staying with parents	281	71.32%
Other	8	2.03%
Unspecified	4	1.02%
	394	100.00%
Preparation prior to lectures		
Yes	114	28.93%
No	278	70.56%
Unspecified	2	0.51%
	394	100.00%
Reasons for not preparing (278 above) [Note: More than 1 option could be chosen]		
No time	54	19.42%
Can still understand lectures without preparation prior to lectures	72	25.90%
Prefer to revise after lectures	140	50.36%
Tried to prepare before but gave up	36	12.95%
Laziness	42	15.11%
Other	21	7.55%
Use of lecturers' consultation hours		
Yes	124	31.47%
No / Unspecified	270	68.56%
	394	100.00%
Making study notes		
Yes	343	87.06%
No / Unspecified	51	12.94%
	394	100.00%
Joining a study group		
Yes	175	44.42%
No / Unspecified	219	55.58%
	394	100.00%
Plan to enrol second-year Economics		
Yes	166	42.13%
No / Unspecified	228	57.87%
	394	100.00%

Table 6: Continued

Level of interest in Economics		
Very interested	113	28.68%
Somewhat interested	144	36.55%
Indifferent	63	15.99%
Not interested	46	11.68%
Very uninterested	23	5.84%
Unspecified	5	1.27%
	394	100.00%
Level of enjoyment in Economics		
Very enjoyable	60	15.23%
Enjoyable	133	33.76%
Indifferent	105	26.65%
Not enjoyable	55	13.96%
Hate Economics	36	9.14%
Unspecified	5	1.27%
	394	100.00%
Working part-time		
Yes, and it affects the studies negatively	40	10.15%
Yes, but it does not affect the studies negatively	46	11.68%
No	296	75.13%
Unspecified	12	3.05%
	394	100.00%
Impact of the use of an English textbook on study		
It affects the studies negatively, since home language is not English	48	12.18%
It does not affect the studies negatively, although home language is not English	109	27.66%
English is the home language	233	59.14%
Unspecified	4	1.02%
	394	100.00%
Weekly study hours outside lectures on ECO134		
0-1 hour	29	7.4%
2 hours	68	17.3%
3 hours	61	15.5%
4 hours	45	11.4%
5 hours	49	12.4%
6-10 hours	77	19.5%
More than 10 hours	34	8.6%
Unspecified	31	7.9%
	394	100.0%

More than 12% of the students claimed the use of English has a negative impact on their studies, since their home language is not English. Finally, with regard to the weekly study hours on the course material outside lectures, nearly half of the participants in the survey claimed they spent more than 5 hours per week.

5. Analysis of the ECO134 performance

In this section, the students' performance in the module is analyzed. As mentioned in Section 3, 337 students qualified and wrote the exam. Only 122 students passed the exam (i.e., pass rate was 36.20%), with the mean exam mark being 45.43%.

Furthermore, the 412 students in the sample are divided into six groups (See Table 7), according to their final mark after the exam and re-valuation, for more detailed analysis. It can be seen that about 40% of the students failed the module. On the other hand, only 31 students or 7.52% obtained a final mark of 70% or above[15].

Table 7: ECO 134 final mark category

	Frequency	Percentage
Failed: Not qualified to write exam	53	12.86%
Failed: 0%-49%	116	28.16%
Passed: 50%-54%	93	22.57%
Passed: 55%-59%	52	12.62%
Passed: 60%-69%	67	16.26%
Passed: 70%-100%	31	7.52%
	412	100.00%

Table 8 summarizes the characteristics of the students in each category. First, looking at the racial composition of students who were not qualified to write exam, nearly 40% are Blacks, while only less than 4% are Indians or Whites. However, the Black share drops to 29.0% when looking at the best-performing students (i.e., final mark between 70% and 100%), while the Indian/White share is almost 13%.

With regard to gender, the males are more likely to perform better in the final mark (8.6% got 70%-100% and 18.3% got 60-69%; such proportions are 6.6% and 14.6% respectively in the case of female students). There is also an inverse relationship between age of the students and their performance, as the worse-performing students were older on average. Furthermore, students with English as home language are the better-performing students.

The BAccounting 3-year students are more likely to perform better, as this proportion as percentage of all students in each final mark category is dominant in the best three final mark categories. Besides, it is obvious that students doing BAdmin, BComLaw or programs outside Commerce Faculty (i.e., the category "other" in the table) are more likely to fail to quality for exam or fail after the exam. Additionally, it is interesting that 90% of the BCom 4-year students qualified to write exam, since it is expected that they are the weaker students. However, looking at these students in greater detail, a very high proportion (70.0%) eventually failed after the exam and re-valuation.

Looking at the relationship between the ECO134 performance and the subjects taken in Matriculation, students doing Economics had an advantage, as a higher proportion of them took this subject in the better-performing categories. Besides, those doing English second language under the old curriculum are more likely to fail the module (Figure 2). The same applies to students doing Mathematical Literacy under the new curriculum and those doing Mathematics SG under the old curriculum (Figure 3). Finally, there is a positive relationship between ECO134 performance and attendance in lectures and tutorials.

[15] Looking at these 31 students, only 13 of them obtained a distinction in the final mark, i.e., 75% or above.

Table 8: General characteristics of the students by ECO 134 final mark

	Did not qualify	Fail 0-49%	Pass 50-54%	Pass 55-59%	Pass 60-69%	Pass 70-100%	All students
Race – Racial composition in each final mark category							
Black	39.6%	31.9%	33.3%	26.9%	29.9%	29.0%	32.0%
Coloured	56.6%	52.6%	54.8%	63.5%	58.2%	58.1%	56.3%
Indian/White	3.8%	15.5%	11.8%	9.6%	11.9%	12.9%	11.7%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Race – % of students in each final mark category by race							
Black	15.9%	28.0%	23.5%	10.6%	15.2%	6.8%	100.0%
Coloured	12.9%	26.3%	22.0%	14.2%	16.8%	7.8%	100.0%
Indian/White	4.2%	37.5%	22.9%	10.4%	16.7%	8.3%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
Gender – Gender composition in each final mark category							
Male	49.1%	43.1%	44.1%	36.5%	50.8%	51.61	45.1%
Female	50.9%	56.9%	55.9%	63.5%	49.2%	48.4%	54.9%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Gender – % of students in each final mark category by gender							
Male	14.0%	26.9%	22.0%	10.2%	18.3%	8.6%	100.0%
Female	11.9%	29.2%	23.0%	14.6%	14.6%	6.6%	100.0%
Total	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
Age – Mean years							
Mean age	20.06	19.72	19.38	19.87	19.21	19.29	19.59
Home language – % of students speaking each home language in each final mark category							
Afrikaans	24.5%	15.5%	10.8%	9.6%	10.5%	19.4%	14.3%
English	43.4%	56.0%	58.1%	73.1%	64.2%	58.1%	58.5%
Other	32.1%	28.5%	31.2%	17.3%	25.4%	22.6%	27.2%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Home language – % of students in each final mark category by home language							
Afrikaans	22.0%	30.5%	17.0%	8.5%	11.9%	10.2%	100.0%
English	9.5%	27.0%	22.4%	15.8%	17.8%	7.5%	100.0%
Other	15.2%	29.5%	25.9%	8.0%	15.2%	6.3%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
Degree program - % of students from each program in each final mark category							
BCom 3-year	41.5%	49.1%	46.2%	30.8%	32.8%	25.8%	40.8%
BCom 4-year	7.5%	24.1%	7.5%	0.0%	1.5%	0.0%	9.7%
BAcc 3-year	18.9%	11.2%	30.1%	53.8%	46.3%	58.1%	31.1%
BAcc 4-year	5.7%	0.0%	5.4%	7.7%	13.4%	9.7%	5.8%
BAdmin	11.3%	6.0%	5.4%	1.9%	0.0%	3.2%	4.9%
BComLaw	1.9%	7.8%	4.3%	5.8%	3.0%	3.2%	4.9%
Other	13.2%	1.7%	1.1%	0.0%	3.0%	0.0%	2.9%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Degree program - % of students in each final mark category by program							
BCom 3-year	13.1%	33.9%	25.6%	9.5%	13.1%	4.8%	100.0%
BCom 4-year	10.0%	70.0%	17.5%	0.0%	2.5%	0.0%	100.0%
BAcc 3-year	7.8%	10.2%	21.9%	21.9%	24.2%	14.1%	100.0%
BAcc 4-year	12.5%	0.0%	20.8%	16.7%	37.5%	12.5%	100.0%
BAdmin	30.0%	35.0%	25.0%	5.0%	0.0%	5.0%	100.0%
BComLaw	5.0%	45.0%	20.0%	15.0%	10.0%	5.0%	100.0%
Other	58.3%	16.7%	8.3%	0.0%	16.7%	0.0%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%

Table 8: Continued

	Did not qualify	Fail 0-49%	Pass 50-54%	Pass 55-59%	Pass 60-69%	Pass 70-100%	All students
Year of matriculation - % of students from each year of matriculation in each final mark category							
2008	62.3%	41.4%	65.6%	63.5%	61.2%	54.8%	56.6%
Before 2008	37.7%	58.6%	34.4%	36.5%	38.8%	45.2%	43.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Year of matriculation - % of students in each final mark category by year of matriculation							
2008	14.2%	20.6%	26.2%	14.2%	17.6%	7.3%	100.0%
Before 2008	11.2%	38.0%	17.9%	10.6%	14.5%	7.8%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
% of students doing each Matric subject in each final mark category							
Economics	37.7%	28.5%	29.0%	32.7%	34.3%	51.6%	33.0%
Business Eco.	62.3%	56.0%	47.3%	40.4%	46.3%	51.6%	51.0%
Accounting	73.6%	72.4%	76.3%	84.6%	82.1%	83.9%	77.4%
Physical Sci.	22.6%	35.3%	46.2%	38.5%	46.3%	35.5%	38.4%
Biology	15.1%	36.2%	28.0%	25.0%	23.9%	25.8%	27.4%
% of students in each final mark category by Matric English status							
Home 2008	12.6%	22.2%	25.7%	14.4%	17.4%	7.8%	100.0%
1st add. 2008	18.2%	16.7%	27.3%	13.6%	18.2%	6.1%	100.0%
1st 2007	7.1%	36.5%	19.8%	12.7%	16.7%	7.1%	100.0%
2nd 2007	20.8%	41.5%	13.2%	5.7%	9.4%	9.4%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
% of students in each final mark category by Matric Mathematics status							
Maths 2008	10.7%	17.9%	27.0%	15.8%	19.9%	8.7%	100.0%
Mat. Lit. 2008	32.4%	35.1%	21.6%	5.4%	5.4%	0.0%	100.0%
HG 2007	7.7%	24.6%	18.5%	13.9%	27.7%	7.7%	100.0%
SG 2007	12.7%	46.4%	18.2%	8.2%	7.3%	7.3%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
Mean entry points – English + Maths + best 4 other subjects							
Mean	29.70	29.43	31.03	32.81	34.09	34.84	31.42
Mean (Excl. Life Orientation in 2008)[16]	28.49	28.74	29.95	32.06	33.15	34.19	30.53
Mean entry points – Best 4 other subjects							
Mean	20.23	20.21	21.18	22.42	23.51	24.23	21.55
Mean (Excl. Life Orientation in 2008)	19.02	19.52	20.10	21.67	22.57	23.58	20.66
% of students in each category by ECO 135 enrolment status							
Yes	7.7%	23.1%	20.5%	15.4%	23.1%	10.3%	100.0%
No	13.4%	28.7%	22.8%	12.3%	15.5%	7.2%	100.0%
	12.9%	28.2%	22.6%	12.6%	16.3%	7.5%	100.0%
Mean lecture attendance							
Mean	0.89	1.41	2.05	2.27	2.84	2.94	1.94
Mean tutorial attendance							
Mean	4.53	6.90	7.24	7.56	7.61	7.68	6.93

[16] Life Orientation became a compulsory subject under the new curriculum. However, for consistent comparison of the total entry points across the two groups of matriculants, it is decided to exclude such subject when calculating the students' entry points.

Figure 2: ECO134 performance by Matric English category

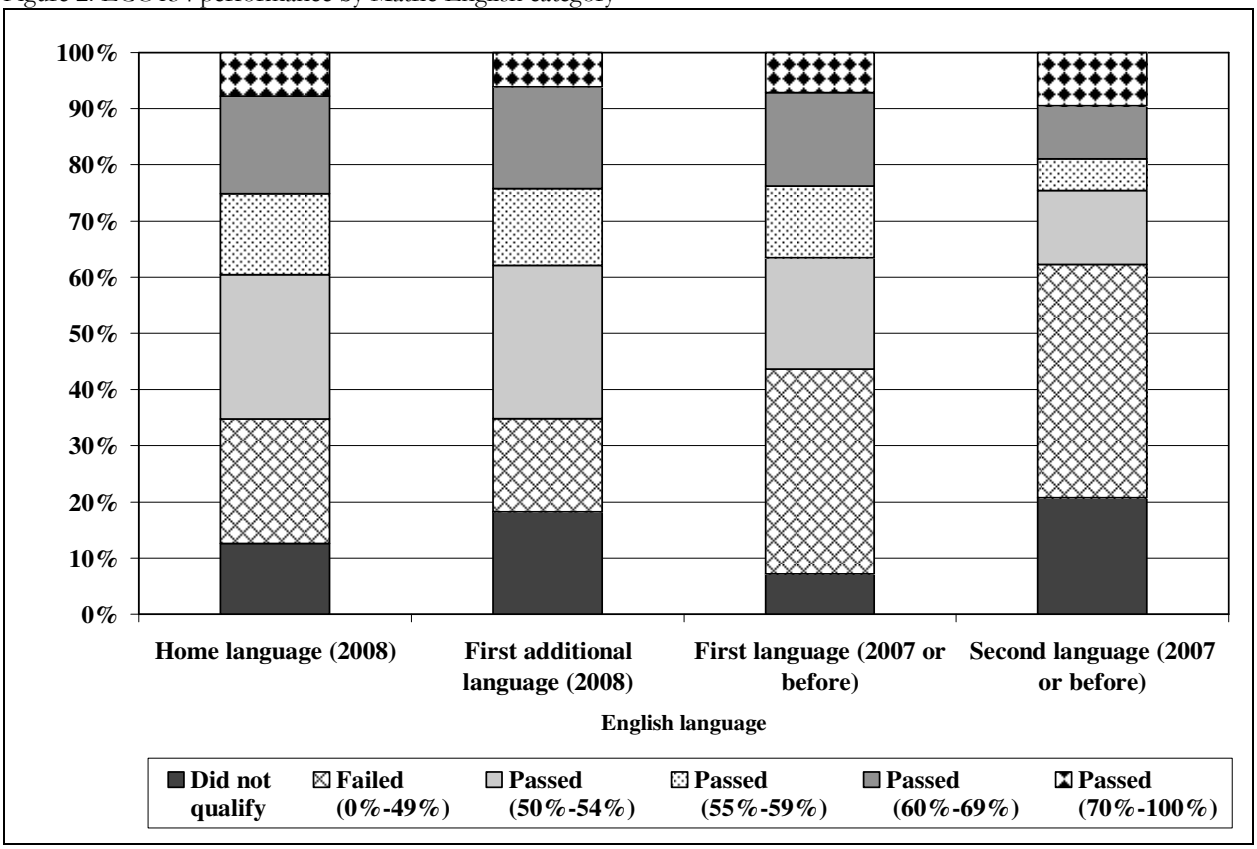
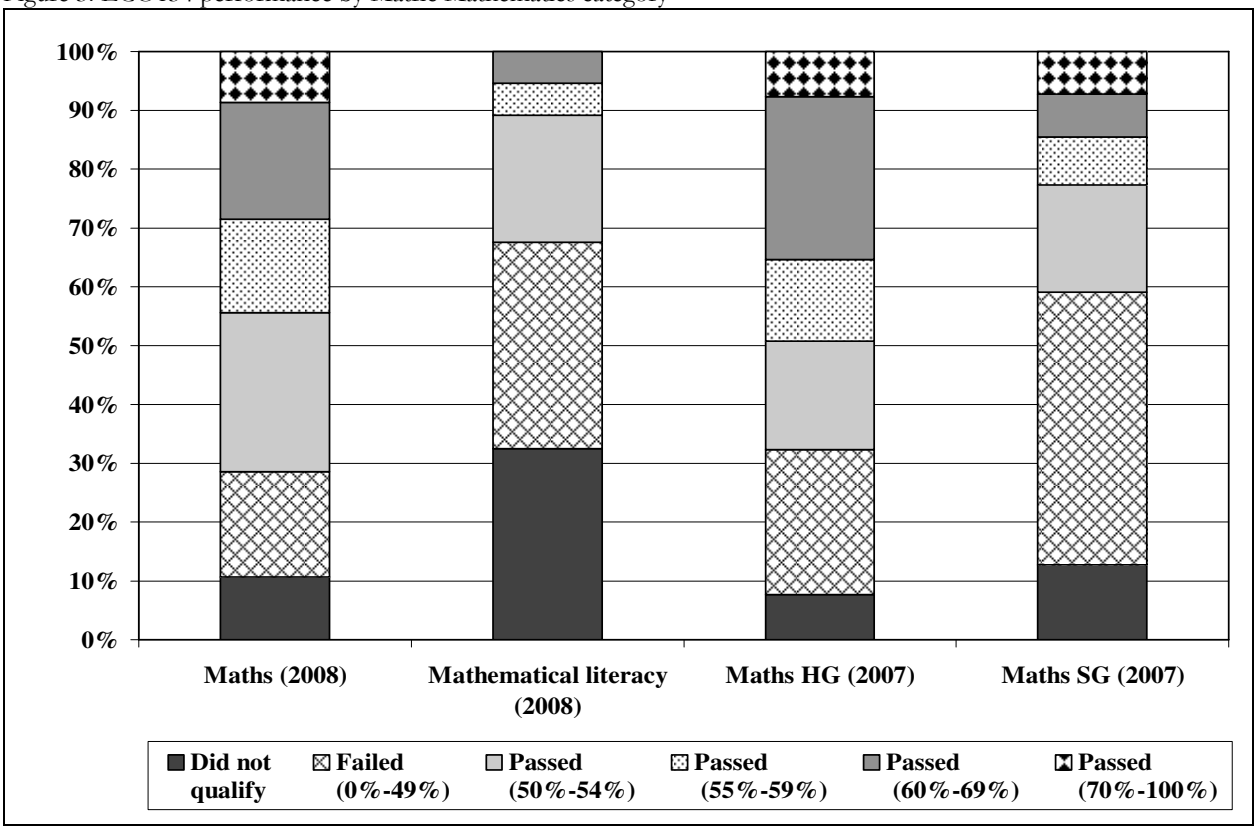


Figure 3: ECO134 performance by Matric Mathematics category



6. Econometric analyses

The preceding descriptive analyses are limited since they only considered some variables when describing the characteristics of the students. The purpose of this section is to expand the descriptive analyses by investigating the role of various factors that influence the students' exam mark.

Since some students did not write the exam (either because they did not qualify to write it, or they were absent from it – see Figure 1), the results of an OLS regression will be biased due to sample selection problems. The most common technique applied to address this problem is a two-step Heckman model. The first step is a probit analysis to identify the factors determining whether the students wrote the exam or not. The second step investigates the factors influencing the exam mark[17].

Based on the existing literature (see Section 1), the explanatory variables included in the first step are as follows: Race (reference group being Blacks)[18], gender dummy variable (reference group being female), age dummy variables (reference group: 19 years), lecture and tutorial attendance. In addition, dummy variables that indicate whether the student matriculated from schools in the Western Cape Education Department and did Matric Economics respectively are also included. Finally, 4 students did not write the first test (test1). For this reason, an interaction variable is created in order to include these students as part of the sample. They receive a mark of zero for test1. A dummy variable is created that indicates whether the students wrote test1 or not. The interaction variable is the product of the revised test1 marks and the dummy variable.

In the second step, all the explanatory variables of the first step, except for the interaction variable, are included. Furthermore, the following variables are included: dummy variables that indicate the students stayed at the student residences and enrolled for ECO135 respectively, dummy variables on home language (reference group being Afrikaans) and the degree program for which they were registered (reference group is BCom 3-year).

To capture the impact of the new Matric curriculum, a dummy variable that represents students matriculating in 2008 is also included. In addition, two dummy variables are included to capture the performance of students in Matric English under the old and new curricula. Similarly, this is also done for Matric Mathematics. Finally, the Matric entry points of the best four subjects other than English and Mathematics (Life Orientation is excluded for the 2008 matriculants) is also included.

From the survey, some study characteristics of the students are included. First, a dummy variable representing the weekly study hours spent on the module outside lectures is included. It is equal to 1 if the number of study hours exceeds 4 hours per week. Secondly, a dummy variable capturing the part-time status of the students is included. Thirdly, a control variable that captures the impact of the use of an English textbook for non-English speaking students is also included. Finally, a dummy variable that controls for the students taking part in the survey is included.

[17] Table A.2 of Appendix I provides some summary statistics on the proportion of students writing the exam as well as the mean exam marks by various criteria.

[18] Due to the fact that there are only 6 White students in the sample, it was decided to group Indians and Whites together in the regression.

Table 9: Two-step Heckman regression on the ECO134 exam mark

Exam mark	**Coefficient**
Dummy variable: Coloured	-2.168
Dummy variable: Indian or White	-2.316
Dummy variable: Male	2.916**
Dummy variable: Over 20 years	-1.218
Dummy variable: 20 years	-3.414*
Dummy variable: Under 19 years	1.446
Dummy variable: Staying at university residence	0.113
Dummy variable: Home language - English	-1.038
Dummy variable: Home language - African languages	-2.090
Dummy variable: Program - BCom 4-year	-3.402**
Dummy variable: Program - BAccounting 3-year	4.042***
Dummy variable: Program - BAccounting 4-year	4.717*
Dummy variable: Program - BAdmin	-9.423***
Dummy variable: Program - BComLaw	-3.086
Dummy variable: Program - Other	-4.172
Dummy variable: Enrolled the ECO135 module	1.938
Lecture attendance	0.335
Tutorial attendance	-0.022
Dummy variable: Matriculated in 2008 under the new curriculum	-4.477***
Dummy variable: Matric English home language symbol A or B (2008)	5.294***
Dummy variable: Matric English first language HG symbol A or B (2007 or before)	6.558***
Dummy variable: Matric Mathematics symbol A or B (2008)	2.212
Dummy variable: Matric Mathematics HG symbol A or B or C (2007 or before)	0.627
Dummy variable: Matric Economics	1.373
Total entry points in the best 4 other Matric subjects (Excluding Life Orientation)	0.042***
Total entry points in the best 4 other Matric subjects (Excluding Life Orientation) squared	0.001
Dummy variable: Matriculated exam department - other than Western Cape	1.649
Dummy variable: Took part in the ECO134 student survey	-2.911
Dummy variable: Use of an English textbook affects studies negatively	-3.935*
Dummy variable: Worked part-time	-2.697**
Dummy variable: Weekly study hours on the module - at least 5 hours	2.607**
Constant	37.864
Selection equation: Qualified for exam and wrote exam	
Dummy variable: Coloured	0.189
Dummy variable: Indian or White	-0.122
Dummy variable: Male	0.208
Dummy variable: Over 20 years	0.071
Dummy variable: 20 years	0.194
Dummy variable: Under 19 years	-0.118
Lecture attendance	0.076**
Tutorial attendance	0.311***
Dummy variable: Matric Economics	-0.180
Dummy variable: Matriculated exam department - other than Western Cape	-0.051
Interaction variable: Wrote test1 × Revised test1 mark	0.042***
Constant	-3.393***
Lambda	-11.569***
R-squared	0.30
Adjusted R-squared	0.24
Number of observations	412

The result of the Heckman regression is presented in Table 9. In the first step, race does not significantly influence the probability of writing the exam, although the sign of the coefficients indicates that Coloured students are more likely to write the exam. The same finding is observed when looking at gender and age of the students, with male and elderly students having a greater likelihood of writing the exam.

A higher tutorial and lecture attendance is associated with a greater probability of writing the exam, with the coefficient of the former variable being greater and more statistically significant. This result is expected, since tutorial test mark is one of the components of the course mark (see Table 2). This supports the findings of Van Walbeek (2004), Andrietti *et al.* (2008), and Horn and Jansen (2009). The results should be treated with caution though, as the endogeneity problem (as discussed by Andrietti *et al.* (2008)) may not have been fully accounted for[19].

Furthermore, the interaction variable on test1 mark has a positive sign and is statistically significant. This implies students who performed well in test1 are more than likely to write the exam, as also found by Smith (2009). Finally, students who had Matric Economics and matriculated from schools outside the Western Cape Education Department are less likely to write the exam. However, these results are statistically insignificant.

In the second step, the results indicate that once again, the race dummy variables are statistically insignificant. With regard to sign of the coefficients, contrary to the findings of Van Walbeek (2004) and Parker (2006), Black students perform relatively better in the exam. Moreover, male students perform relatively better, which is consistent with the results of Parker (2006), and Horn and Jansen (2009). Students who were 20 years old at the time of the study perform significantly worse, compared to the reference group (19-year-olds). This contrasts the findings of Van Walbeek (2004) and Parker (2006), who find that elderly students perform better.

With reference to the impact of Matric characteristics on the exam mark, the dummy variable that indicates students matriculating under NCS is negative and statistically significant. These students perform 4.5 percentage points lower than the matriculants from SC. Moreover, the Matric entry points for the best four subjects[20] contribute positively and significantly towards students' exam performance. This supports empirical evidence on Matriculation results being a good proxy for academic ability (Okpala *et al.* (2000), Smith & Edwards (2007), Smith (2009)). With regard to the impact of the new Matric curriculum, the results reflect that students who matriculated in 2008 under the NCS perform significantly worse by 4.4 percentage points. Moreover, students who obtained an A or B symbol in English home language 2008 still perform relatively better in the exam. However, their performance is slightly lower by 1.3 percentage points than those students who obtained an A or B symbol in English first language HG in 2007 or before in the SC.

Students with better results in Mathematics Higher Grade in SC and Mathematics in NCS are associated with better exam results, but the latter variable has a greater coefficient. However, both these results are statistically insignificant. This finding is quite unexpected, as the study by Hunt *et al.* (2009) find that students with Mathematics HG have a stronger ability to cope at university, as compared to students with completed Mathematics under NCS. Upon further investigation of

[19] In an attempt to address this problem, an instrumental variable (IV) regression is run to predict the course mark of the students. The instruments for lecture attendance include dummy variables for taking part in the survey, staying at residence, and working part-time. The results are presented in Table A.3 of the Appendix I. Since it is not possible to run a two-step Heckman regression with instrumental variables, a decision was made not to run this regression with the exam mark as the dependent variable.

[20] Refer to footnote 5 on the calculation of the entry points.

students with good results in Mathematics HG (obtaining A, B or C symbols), however, the data reveal only three students obtained an A symbol, and surprisingly, they all perform relatively worse than those with B or C symbols. Two of the three students matriculated outside South Africa. Given this, the regression is re-estimated with a revised Matric Mathematics HG dummy which only includes students with B or C symbols. The results from this regression indicate that the former students now perform significantly better than students with good results in Mathematics under NCS.

Finally, in contrast to the result in the first step, students with Matric Economics perform relatively better in the exam. However, this dummy variable is once again not statistically significant. This is consistent with the findings of Van Walbeek (2004) but contrasting the results of Smith and Edwards (2006) and Smith (2009).

As far as the relationship between the home language of the students and their exam performance is concerned, both the English and African language dummy variables are negative but insignificant (as compared to the reference group). This could be explained by the English Matric dummy variables already capturing the impact of language on exam performance.

Furthermore, students enrolled for the BAccounting 3-year degree clearly outperform students enrolled for other degree programs. This result is not surprising since these students are usually academically stronger. Finally, students who stayed in university residences perform relatively better, but this finding is insignificant.

The results for tutorial and lecture attendance in the second step have opposite signs, but both are insignificant. In the case of tutorial attendance, the contrasting results in the two steps may reflect that tutorial attendance has a greater impact on the likelihood to write exam since it comprises a relatively big proportion of the course mark. It should also be kept in mind that tutorial attendance is compulsory. Therefore, it is not surprising to find that tutorial attendance does not influence exam performance. With regard to the insignificant result of lecture attendance in the second step, it is possible that other explanatory variables have already captured the students' academic ability. This might also explain why the dummy variable for students who were enrolled for the ECO135 module is positive but insignificant. This module is normally taken by students who are mathematically stronger.

Three variables from the student survey contribute significantly towards students' exam performance. First, students who worked part-time perform relatively worse by almost 2.7 percentage points. This is also found by Kottasz (2005) and Carney *et al.* (2005). Secondly, students who study at least 5 hours per week outperform the remaining students by 2.6 percentage points. This contrasts the results of Okpala *et al.* (2000). Finally, students who indicated that the use of an English textbook affected their studies negatively, perform relatively worse by almost 4 percentage points. All three dummy variables as mentioned above are statistically significant. Other variables from the survey such as the parents' highest educational attainment achieved, as well as the levels of interest and enjoyment in Economics are insignificant and hence are excluded from the second step.

Table A.3 provides more information by presenting the result of the two-stage-least-square regression, with course mark being the dependent variable. Similar results are observed, except that Matric Economics and ECO 135 enrolment have a positive and significant contribution towards students' academic performance in ECO 134.

7. Conclusion

Most local studies have included students' Matric results as a predictor of academic performance in first-year Economics studies. With the introduction of the revised Matric curriculum, the question arises as to whether Matric performance is still a good proxy for academic ability, and whether there is a difference in academic performance between students who matriculated from the new curriculum as opposed to the old curriculum. In addition, factors such as the students' time spent on studying outside lectures and work status are less commonly used as explanatory variables.

This study used a two-step Heckman model to investigate the factors influencing the academic performance of first-year Economics at UWC, with a particular focus on the impact of the revised Matric curriculum. The main findings are that students who matriculated under the new curriculum perform relatively weaker. In addition, students who worked part-time and spent relatively less time studying outside lectures perform worse.

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Appendix I

Table A.1: Comparison of the first-year Economics curricula at Stellenbosch and UWC

	Stellenbosch	**UWC**
ECO 114	**ECO114**	**ECO133/134**
Introduction to Economics	✓	✓
The economic problem	✓	✓
The South African economy	✓	✓
Demand and supply	✓	✓
Consumer choice theory	✓	
Elasticity	✓	✓
Efficiency and equity	✓	✓
Markets in action	✓	✓
Production and costs	✓	✓
Perfect competition	✓	✓
Monopoly	✓	✓
Monopolistic competition and oligopoly	✓	
Action against misuse of market power	✓	
Externalities	✓	
Public goods	✓	
Factors market – Labour market as an example	✓	
	16/16	**10/16**
ECO 144	**ECO144**	**ECO133/134**
Macroeconomic measurement: Prices and unemployment	✓	✓
Macroeconomic measurement: GDP and real GDP	✓	✓
Aggregate demand and aggregate supply	✓	
The self-regulating economy: The Classical view	✓	
Economic instability: The Keynesian framework	✓	✓
Fiscal policy	✓	✓
Money and banking	✓	✓
The South African Reserve Bank	✓	
Money and the economy	✓	✓
Monetary policy	✓	
Expectations theory and growth	✓	
Economic growth: Resources, technology and ideas	✓	
The South African economy in the twentieth century	✓	
International trade	✓	
International finance	✓	✓
Globalization	✓	
	16/16	**7/16**
Total	**32/32**	**17/32**

Table A.2: Proportion of students writing the exam and the mean exam mark (standard deviation in parentheses)

	% of students writing exam	Mean exam mark
All	81.80%	45.43 (13.11)
BY DEMOGRAPHIC CHARACTERISTICS		
Race		
Black	79.55%	45.16 (13.29)
Coloured	82.33%	45.63 (12.62)
Indian/White	85.42%	45.17 (15.09)
Gender		
Male	81.18%	46.58 (13.74)
Female	82.30%	44.49 (12.54)
Home language		
Afrikaans	74.58%	44.10 (14.30)
English	84.65%	46.24 (12.67)
African/Other languages	79.46%	44.24 (13.51)
Birth year		
1988 or before (i.e., older than 20 years)	71.62%	44.61 (14.26)
1989 (i.e., aged 20 years)	80.00%	43.53 (14.64)
1990 (i.e., aged 19 years)	84.62%	46.05 (12.29)
1991-1992 (i.e., 17-18 years)	86.60%	46.52 (12.32)
Province of usual residence		
Western Cape	82.56%	45.24 (12.65)
Other provinces / Outside South Africa	77.94%	46.46 (15.46)
BY MATRICULATION CHARACTERISTICS		
Year of matriculation		
In 2008	83.26%	45.83 (11.89)
Before 2008	79.89%	44.89 (14.63)
Province of matriculation		
Western Cape	82.20%	44.79 (12.65)
Other provinces / Outside South Africa	80.00%	48.39 (14.81)
Matric English		
Home language (2008)	84.43%	45.89 (11.82)
First additional language (2008)	80.30%	45.68 (12.20)
First language (2007 or before)	83.33%	45.06 (14.64)
Second language (2007 or before)	71.70%	44.41 (14.77)
Matric Mathematics		
Mathematics (2008)	86.73%	46.59 (12.06)
Mathematical Literacy (2008)	64.86%	40.44 (9.18)
Mathematics HG (2007 or before)	83.08%	47.83 (14.27)
Mathematics SG (2007 or before)	78.18%	42.75 (14.66)
Matric Economics		
Yes	82.35%	46.70 (12.88)
No	81.52%	44.80 (13.21)
Matric Business Economics/Studies		
Yes	78.10%	44.67 (12.73)
No	85.64%	46.15 (13.46)
Matric Accounting		
Yes	82.45%	45.69 (12.75)
No	79.57%	44.52 (14.38)
Matric Physical Science		
Yes	86.71%	46.09 (13.80)
No	78.74%	44.98 (12.64)
Matric Biology		
Yes	82.30%	45.09 (14.81)
No	81.61%	45.56 (12.43)

Table A.2: Continued

	% of students writing exam	Mean exam mark
BY STUDY CHARACTERISTICS		
Program		
BCom (3-year)	79.76%	44.05 (12.46)
BCom (4-year)	77.50%	34.84 (9.13)
BAcc (3-year)	89.84%	50.14 (11.98)
BAcc (4-year)	87.50%	52.48 (10.52)
BAdmin	65.00%	37.69 (12.95)
BComLaw	90.00%	42.58 (15.59)
BA / LLB / BSc	41.67%	40.70 (19.40)
Enrolled ECO135		
Yes	87.18%	47.07 (16.08)
No	81.23%	45.25 (12.75)
Tutorial attendance		
0-5	31.37%	44.06 (11.30)
6	73.33%	40.77 (11.75)
7	91.07%	43.18 (12.83)
8	91.18%	47.61 (13.29)
Lecture attendance		
0	70.88%	41.76 (12.67)
1	88.68%	44.22 (12.63)
2	83.78%	47.61 (14.69)
3	88.46%	48.91 (12.19)
4	88.46%	52.91 (12.50)
5	97.22%	47.71 (13.15)
6	94.23%	48.09 (11.90)
BY ECO134 STUDENT SURVEY RESULTS		
Highest education of either parent		
None – Incomplete primary	76.47%	41.77 (13.86)
Incomplete secondary	87.69%	48.09 (13.74)
Matric	84.55%	43.53 (12.27)
Matric + Certificate/Diploma	84.85%	45.55 (13.02)
Degree	84.34%	45.91 (13.41)
Residence status		
Student residence	84.93%	44.44 (13.30)
Private residence	89.29%	45.68 (14.70)
Staying with parents	84.34%	45.67 (13.01)
Preparation prior to lectures		
Yes	88.60%	45.50 (13.85)
No	83.45%	45.47 (12.86)
Use of lecturers' consultation hours		
Yes	87.10%	46.31 (12.53)
No	82.59%	45.41 (13.63)
Making study notes		
Yes	85.42%	45.49 (13.23)
No	85.00%	44.90 (13.28)
Joining a study group		
Yes	90.29%	46.08 (13.89)
No	81.07%	44.86 (12.61)
Plan to enrol second-year Economics		
Yes	87.95%	45.60 (13.56)
No	82.33%	45.13 (13.02)

Table A.2: Continued

	% of students writing exam	Mean exam mark
BY ECO134 STUDENT SURVEY RESULTS		
Level of interest in Economics		
Very interested	89.38%	47.98 (14.14)
Somewhat interested	79.17%	44.33 (12.85)
Indifferent	84.13%	46.20 (13.41)
Not interested	86.96%	41.05 (10.48)
Very uninterested	91.30%	45.07 (12.40)
Level of enjoyment in Economics		
Very enjoyable	88.33%	49.74 (14.42)
Enjoyable	86.47%	46.60 (14.06)
Indifferent	81.90%	43.65 (11.61)
Not enjoyable	81.82%	42.66 (11.40)
Hate Economics	83.33%	42.35 (12.39)
Part-time work status		
Yes	83.72%	42.54 (13.67)
Yes, and it has negative impact on studies	75.00%	44.33 (13.31)
Yes, but it has no impact on studies	91.30%	41.26 (13.94)
No	85.81%	46.20 (13.01)
Impact of the use of English textbook		
Negative impact, as home language is not English	79.17%	38.26 (11.15)
No negative impact, although home language is not English	83.49%	46.74 (14.11)
Weekly study hours on ECO134		
0-1 hour	82.76%	43.79 (11.68)
2 hours	85.29%	45.87 (13.39)
3 hours	75.41%	45.90 (14.92)
4 hours	95.56%	45.31 (12.02)
5 hours	89.80%	46.84 (13.46)
6-10 hours	84.42%	44.43 (12.89)
More than 10 hours	88.24%	46.33 (12.72)

Table A.3: IV regression on year mark

Instrumental variables (2SLS) regression	
Year mark	**Coefficient**
Dummy variable: Coloured	1.739
Dummy variable: Indian or White	4.000
Dummy variable: Male	1.549
Dummy variable: Over 20 years	-0.898
Dummy variable: 20 years	-1.872
Dummy variable: Under 19 years	1.212
Dummy variable: Home language - English	-2.057
Dummy variable: Home language - African languages	-2.212
Program: BCom 4-year	-1.630
Program: BAccounting 3-year	6.133***
Program: BAccounting 4-year	7.385***
Program: BAdmin	-3.810
Program: BComLaw	2.483
Program: Other	-6.553*
Enrolled the ECO135 module	7.002***
Tutorial attendance	4.327***
Lecture attendance	0.808
Matriculated in 2008 under the new curriculum	-5.073*
English home language symbol A or B (2008)	1.927
English first language HG symbol A or B (2007 or before)	6.880**
Mathematics symbol A or B (2008)	5.111***
Mathematics HG symbol A or B or C (2007 or before)	1.551
Matric Economics dummy	3.218***
Total entry points in the best 4 other subjects (Excluding Life Orientation)	0.058***
Total entry points in the best 4 other subjects (Excluding Life Orientation) squared	0.000***
Dummy variable: Matriculated exam department - other than Western Cape	1.436
Took part in the ECO134 student survey	7.770**
Home language is NOT English + Use of an English textbook affects studies negatively	-4.941***
Weekly study hours on the module: at least 5 hours	2.025*
Constant	-4.821
R-squared	0.64
Adjusted R-squared	0.62
Number of observations	412

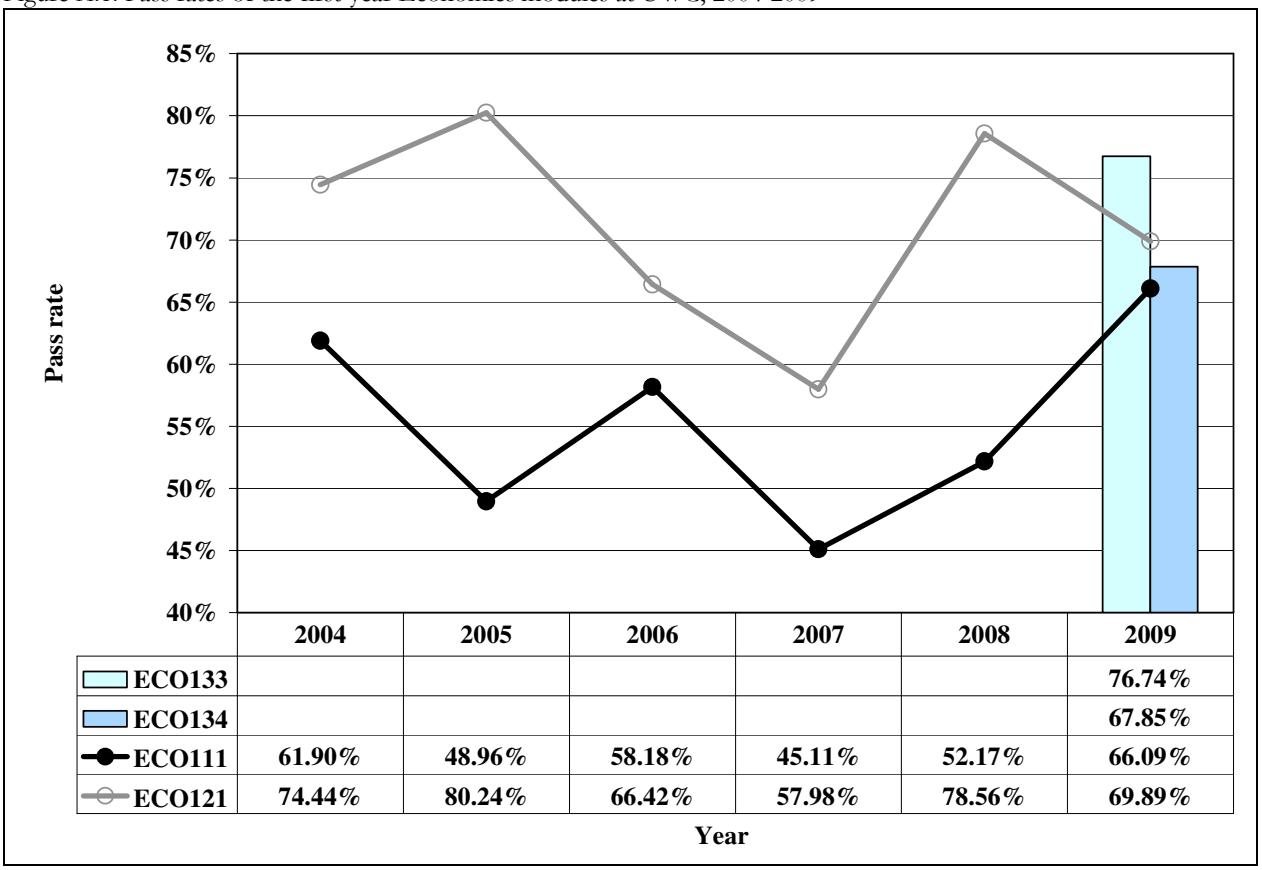
** Significant at 1%
** Significant at 5%
* Significant at 10%

Table A.3: Continued

First-stage regression	
Lecture attendance	**Coefficient**
Dummy variable: Coloured	-1.025**
Dummy variable: Indian or White	-0.894
Dummy variable: Male	0.517**
Dummy variable: Over 20 years	-0.008
Dummy variable: 20 years	-0.531
Dummy variable: Under 19 years	0.279
Dummy variable: Home language - English	-0.288
Dummy variable: Home language - African languages	-0.767
Program: BCom 4-year	-0.051
Program: BAccounting 3-year	-0.313
Program: BAccounting 4-year	0.242
Program: BAdmin	0.324
Program: BComLaw	-0.019
Program: Other	0.242
Enrolled the ECO135 module	0.474
Tutorial attendance	0.264***
Matriculated in 2008 under the new curriculum	1.310***
English home language symbol A or B (2008)	0.126
English first language HG symbol A or B (2007 or before)	0.878
Mathematics symbol A or B (2008)	-0.323
Mathematics HG symbol A or B or C (2007 or before)	1.310**
Matric Economics dummy	0.025
Total entry points in the best 4 other subjects (Excluding Life Orientation)	0.001
Total entry points in the best 4 other subjects (Excluding Life Orientation) squared	0.000
Dummy variable: Matriculated exam department - other than Western Cape	0.014
Took part in the ECO134 student survey	1.564***
Home language is NOT English + Use of an English textbook affects studies negatively	-0.187
Weekly study hours on the module: at least 5 hours	0.170
Dummy variable: Staying at university residence	-0.651
Dummy variable: Worked part-time	-0.660**
Constant	-1.522***
R-squared	0.25
Adjusted R-squared	0.19
Number of observations	412

** Significant at 1%
** Significant at 5%
* Significant at 10%

Figure A.1: Pass rates of the first-year Economics modules at UWC, 2004-2009



	2004	2005	2006	2007	2008	2009
ECO133						76.74%
ECO134						67.85%
ECO111	61.90%	48.96%	58.18%	45.11%	52.17%	66.09%
ECO121	74.44%	80.24%	66.42%	57.98%	78.56%	69.89%

Note: Pass rate = Number of students passed the module / Number of students qualified to write the exam.
Note: ECO111: Microeconomics
ECO121: Macroeconomics
ECO133: Principles of Economics
ECO134: Principles of Economics

Appendix II The ECO 134 student survey questionnaire[21]

SECTION A: DEMOGRAPHIC INFORMATION

(1) Where you born in South Africa?
- 1 ☐ Yes
- 2 ☐ No

If "No", please specify the country of birth: .....

(2) Do you usually stay in the Western Cape province?
- 1 ☐ Yes
- 2 ☐ No

If "No", please specify the usual province of residence: .....

(3) Please specify your race group.
- 1 ☐ Black
- 2 ☐ Coloured
- 3 ☐ Indian
- 4 ☐ White
- 5 ☐ Other .....

(4) Please specify your gender.
- 1 ☐ Male
- 2 ☐ Female

(5) Please specify your birthday.

Year of birth: .....

Month of birth: .....

(6) What is your home language?
- 1 ☐ Afrikaans
- 2 ☐ English
- 3 ☐ isiNdebele
- 4 ☐ isiXhosa
- 5 ☐ isiZulu
- 6 ☐ Sepedi
- 7 ☐ Sesotho
- 8 ☐ Setswana
- 9 ☐ SiSwati
- 10 ☐ Tshivenda
- 11 ☐ Xitsonga
- 12 ☐ Other

(7) What is the highest educational attainment of your either parent (or guardian, if both your parents are deceased)?
- 1 ☐ No schooling
- 2 ☐ Grade 1 – Grade 6
- 3 ☐ Grade 6 – Grade 11 OR Certificate/Diploma without Matric
- 4 ☐ Matric
- 5 ☐ Matric + Certificate/Diploma
- 6 ☐ Degree or above
- 7 ☐ I am not sure / I don't know

[21] The content of this questionnaire is similar to the one conducted by Horn *et al.* (2008).

SECTION B: MATRIC RESULTS

(8) Where did you complete Matric?
Country: .....
Province: .....

(9) Please specify your Matric results by filling in the following table:

Subject	Grade (HG/SG)	Symbol	Percentage (%)
	Aggregate:		

SECTION C: REGISTRATION AT UWC

(10) Please specify the Degree program you have registered
Faculty (e.g., Commerce, Arts, etc.): .....
Program name (e.g., BCom, BAcc, BAdmin, etc.): .....
Three-year or Four-year degree program?
1 ☐ Three-year Degree program
2 ☐ Four-year Degree program

(11) How many modules have you registered this semester? .....

(12) How many modules have you registered this year? .....

(13) Do you also do Basic Mathematical Economics (ECO 135) this year?
1 ☐ Yes
2 ☐ No

(14) Will you register any second-year Economics modules(s) next year?
1 ☐ Yes
2 ☐ No

SECTION D: RESIDENCE STATUS

(15) Where do you stay?
1 ☐ Student residence at UWC (Please go to Question 19)
2 ☐ Private residence/hostel close to UWC
3 ☐ Staying with family
4 ☐ Other, please specify .....

(16) How do you travel from the place of residence to campus?
1 ☐ Motor vehicle
2 ☐ Bus
3 ☐ Train
4 ☐ Taxi
5 ☐ I walk to the campus

(17) How far do you travel daily (in kilometres) the place of residence to campus? ..... km

(18) How much time (in minutes) do you need to travel daily from the place of residence to campus? ..... minutes

SECTION E: LECTURE ATTENDANCE

(19) How often do you attend lectures?

1 ☐ I attend all lectures
2 ☐ I attend most of the lectures
3 ☐ I attend some of the lectures
4 ☐ I rarely attend lectures

(20) Do you prepare lectures by reading the chapter prior to the lecture?

1 ☐ Yes (Please go to Question 23)
2 ☐ No

(21) If "No" in Question 20, explain the reason (More than 1 option could be ticked)

1 ☐ I don't have time
2 ☐ I manage to understand the lectures without preparing for it
3 ☐ I prefer to study/revise after lectures
4 ☐ I made few attempts to do so but still don't understand the chapter
5 ☐ I am lazy
6 ☐ Other reason(s), please specify .....

(22) Do you make use of your lecturer's consultation hours?

1 ☐ Yes
2 ☐ No

SECTION F: TUTORIAL ATTENDANCE

(23) How often do you attend tutorials?

1 ☐ I attend all tutorials (Please go to Question 25)
2 ☐ I attend most of the tutorials
3 ☐ I attend some of the tutorials
4 ☐ I rarely attend tutorials
5 ☐ I never attend tutorials

(24) Explain the reason(s) that you sometimes do not attend tutorials (More than 1 option could be ticked)

1 ☐ I don't have time
2 ☐ I am not interested in the tutorials
3 ☐ The tutorials do not contribute to my understanding of the subject matter
4 ☐ Classes are too full
5 ☐ Clashes on timetable
6 ☐ I am lazy
7 ☐ Other reason(s), please specify .....

SECTION G: OTHER QUESTIONS

(25) Do you feel that the use of a textbook in a language (i.e., English) different to your home language affects your performance negatively?
- 1 ☐ Yes, if could have a negative impact on my performance
- 2 ☐ No, it won't have any negative impact on my performance
- 3 ☐ No, because the textbook is in my home language (i.e., home language is "English")

(26) Do you make study notes?
- 1 ☐ Yes
- 2 ☐ No

(27) Do you have a study group with fellow classmates?
- 1 ☐ Yes
- 2 ☐ No

(28) How many hours on average do you spend per week on studying the course material of the ECO 134 module?

..... hours

(29) How interested are you in Economics?
- 1 ☐ Very interested
- 2 ☐ Somewhat interested
- 3 ☐ Indifferent
- 4 ☐ Not interested
- 5 ☐ Very uninterested

(30) Do you enjoy studying Economics?
- 1 ☐ Very enjoyable
- 2 ☐ Enjoyable
- 3 ☐ Indifferent
- 4 ☐ Not enjoyable
- 5 ☐ Hate Economics

(31) How do you pay for your studies? (More than 1 option could be ticked)
- 1 ☐ Bursary/Scholarship
- 2 ☐ Paid by parents
- 3 ☐ Paid by myself
- 4 ☐ Other, please specify .....

(32) Do you work part-time?
- 1 ☐ Yes
- 2 ☐ No ***(End of questionnaire, thank you for your participation!)***

(33) If "Yes" in Question 32, does it affect your studies?
- 1 ☐ Yes
- 2 ☐ No ***(End of questionnaire, thank you for your participation!)***

(34) If "Yes" in Question 33, how does working part-time affect your studies (More than 1 option could be ticked)?
- 1 ☐ I am too tired to attend lectures/tutorials
- 2 ☐ I miss some lectures/tutorials because I have to work
- 3 ☐ I feel stressed to cope with both work and studies
- 4 ☐ Other impact, please specify .....

(End of questionnaire, thank you for your participation!)