LECTURE ATTENDANCE VERSUS ACADEMIC PERFORMANCE AND PRIOR KNOWLEDGE OF ACCOUNTING STUDENTS: AN EXPLORATORY STUDY AT A SOUTH AFRICAN UNIVERSITY

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ABSTRACT

This study investigates the impact of lecture attendance on first-year Accounting students' academic performance and whether students' prior accounting knowledge differentially benefit from lecture attendance registered or an accounting degree at a South African university. A mixed method was exploited; quantitative, descriptive in nature and fixed effects regression model. Data was collected firstly, from the university's central computer system and from electronic card readers installed in lecture venues. The overall findings confirm an increase in the correlations' strength between lecture attendance and academic performance. Furthermore, when the study accounted for time-invariant by means of data fixed effects estimators these effects continued and concluded that attendance-performance and prior accounting have over time a significant impact on academic performance. This article adds to several unique contributions to accounting education confirming the importance of students' lecture attendance and prior accounting knowledge that could influence students' academic performance over time. Further research could add value by identifying other reasons which could influence accounting students' academic performance registered for an accounting degree.

Keywords: Academic performance, Accounting, lecture attendance, prior accounting knowledge, South Africa, students, university

INTRODUCTION

Accounting education's future and prior knowledge of students entering academic institutions is an on-going debate since factors that influence student's academic performance attracted the attention of many researchers and educators. Prior research has investigated many factors influencing students' academic performance (Baard et al. 2010; Chansarkar and Michaeloudis 2001; Moore Armstrong and Pearson 2008; Schmulian and Coetzee 2011; Papageorgiou and Callaghan 2017; Wally-Dima and Mbekomize 2013) such as illness, students' parental style, part-time work, absent from lectures, gender, lack of motivation, problems with self-study, improper time management, prior school marks, prior courses attended, lack of funding, travel

time to the institution, personal and accommodation issues. Astin (1984), Lourens and Smit (2003), Mills et al. (2009) and Smith and Naylor (2001) confirmed that personal factors such as the students' background and students' extramural activities also contributed to students attending fewer lectures that may influence their academic performance. The most significant factor that influenced students' academic performance was scholar's high mark obtained in Grade 12 that converted into good academic performance (Steenkamp Baard and Frick 2009). Dweck (1999) and Cassidy and Eachus (2000) referred to students' psychological factors and concluded that if students are confident and have a good self-esteem, it will lead to frequent lecture attendance and better performance.

Student lecture attendance or non-attendance is one of many factors influencing students' performance in higher education institutions worldwide that is not something new. Prior studies explored lecture attendance in various disciplines, subjects and countries. Uyar and Güngörmüş (2011) investigated Accounting students in Turkey, Lyubartseva and Mallik (2012) analysed an advanced chemistry course at Southern Arkansas University in Magnolia, Arkansas, United States of America, Paisey and Paisey (2004) studied Accounting students in Scotland, and Clark et al. (2011) studied geography students at Lancaster University, United Kingdom. Prior Accounting studies confirm that lecture attendance correlates positively with academic performance (Baard et al. 2010; Paisey and Paisey 2004; Papageorgiou and Townsend 2014; Steenkamp et al. 2009; Uyar and Güngörmüş 2011), but some students nevertheless remain absent from lectures. Two first-year accounting students responded as follow regarding the important of lecture attendance: "Lecture attendance is very important as it helps students to understand new work and gives them the opportunity to ask questions" and "It helps lay down the foundation for new concepts and reduces the amount of self-studying that must be done".

Accounting educators have renewed their interest in whether school accounting has an effect on first-year accounting students' academic performance and whether lecture attendance matters for students registered for an accounting course. Due to renewed interest, this article reflects on an investigation into the affect of lecture attendance on students' academic performance and whether those students with prior accounting knowledge differentially benefit from lecture attendance, enrolled for an accounting degree. South Africa has currently twenty three public universities that are grouped as follows in three categories: firstly, six traditional universities, which offer theoretically-oriented degrees; secondly, six universities of technology, which offer vocational oriented diplomas and degrees; finally and eleven research-intensive comprehensive universities, which offer a combination of both categories of universities, conducting pure and applied research (Pitso 2013). Two major differences between public and private universities are; firstly, that most public universities are funded by the

government and secondly, that students of private universities are divided into smaller classes in comparison to public universities. In this study, the university under review is a South African public university ranked as the highest among the universities in Africa, according to the Centre for World University Rankings (CWUR) (CWUR 2017).

The purpose of this study investigates the impact of first-year accounting students' lecture attendance on their academic performance and whether these students with prior accounting knowledge differentially benefit from lecture. This study's motivation was that a decline in lecture attendance was noticed in lectures and evidently an investigation was launched to determine why students do not attend lectures. A possible reason could be that some students with prior knowledge of accounting prefer not to attend lectures and are absent from lectures. The accounting programme is characterised by extremely large classes, as well as a diverse range of prior knowledge that students bring to these lectures (Scott Yeld and Hendry 2007; Műller Prinsloo and Du Plessis 2007; Steenkamp et al. 2009).

In an attempt to increase students' academic performance and eventually, the throughput rate, it is vital to explore the factors that affect students' marks. Research findings could be useful to higher education institutions, students and professional bodies. This study was inspired by two studies: Paisey and Paisey (2004) and Van Rensburg, Penn, and Haiden (1998). Paisey and Paisey (2004) recommend further research into patterns of students attending lectures and the relationship between lecture attendance and academic performance, which could increase academic performance, and Van Rensburg et al. (1998) concluded that prior Accounting exposure improved student performance. The following two research questions were tested:

- Do lecture attendance matters of first-year Accounting students?
- Do students with prior accounting knowledge differentially benefit from lecture attendance?

This article begins with the literature review thereafter the method, findings, conclusion, limitations and recommendations for future research were discussed.

LITERATURE REVIEW

Internationally and nationally, extensive literature was investigated to determine the relationship between lecture attendance and students' marks. Students' non-attendance of lectures is not a new phenomenon and evidence confirmed that traditional correlation studies indicated that lecture attendance is positively but less likely to be nil or negatively related to

academic performance. While a mixed nature of evidence, using different methodological approaches, confirm less robust conclusions and suggested that a causal link has not yet been established between lecture attendance and academic performance and little attention was given to the relationship between students with prior accounting knowledge and lecture attendance. Prior studies raised the following questions; "Do students attend lectures? Should they?" (Romer 1993), "Does attendance improve academic performance?" (Paisey and Paisey 2004) and ten years later, this phenomenon still exists on whether lecture attendance influence academic performance, "Does lecture attendance affect academic performance? ..." (Andrietti 2014).

The main focus of prior studies (Lin and Chen 2006; Moore 2003; Paisey and Paisey 2004; Clark et al. 2011; Park and Kerr 1990; Romer 1993; Massingham and Herrington 2006) refers to correlation studies and found that students, whose cumulative lecture attendance was good, performed better academically than students who tend to miss lectures. In the South African literature, the correlation studies of Schmulian and Coetzee (2011) confirmed that a significant positive correlation between lecture attendance and academic performance exist for second-year Financial Accounting students but the correlation was low and not meaningful, while Steenkamp et al. (2009) concluded that students with a higher lecture attendance ratio had a significantly higher success rate than students with poor lecture attendance. In the international literature, correlation studies indicate "evidence of a positive correlation between lecture attendance and academic performance" where "students who always attend lectures show statistically significant performance advantages over students who 'seldom' or 'never' attend lectures" (Thatcher Fridjhon and Cockcroft 2007, 658), and Newman-Ford et al. (2008, 715) used a reliable, electronic attendance monitoring system for quick identification to increase students' lecture attendance and improve students' prospects of academic successes. In a more recent South African study, a sample 3 075 first-year accounting students over a period of five years were investigated to investigate the impact of students' profile and their academic performance and concluded that a trend was visible that "more students failed Accounting I with no Accounting in Grade 12 than students who passed Accounting I" that had Accounting as a school subject (Papageorgiou 2017, 223).

Prior correlation studies refer to the causal nature of attendance-performance relationships while this literature review highlights prior studies that underpin the theoretical framework which indicates a systematic methodology approach to investigate the causal nature of attendance-performance. In a recent study, Andrietti (2014) used proxy variables regression capturing the effect of unobservable student traits correlated to 137 economic students' lecture attendance who participated in a survey in 2004/5 at a public university in Italy, but when the

study accounted for time-invariant by means of data fixed effects estimators the effects disappeared and confirmed that there was no significant impact on the academic performance of students who attend lectures. In addition, another recent study by Andrietti and Veleasco (2015) provided a more systematic review on the different empirical approaches to address the endogeneity of lecture attendance of economic students who participated in a survey at a public university in Spain. Cross sectional studies concluded in their findings that class attendance had a positive influence on students' performance (Durden and Ellis 1995; Devadoss and Foltz 1996). In panel data studies, Marburger (2001) investigated absenteeism and examination performance of sixty Microeconomics students at a university in America. Attendance registers were kept in the class periods during the semester and the results concluded that exam score mean was significantly affected by absenteeism. Furthermore, Rodgers and Rodgers (2003) used panel data estimators to account for time intervals for individual heterogeneity to investigate the academic effectiveness of class attendance of 131 Microeconomics' students at an Australia university. Lecture attendance registers were kept and the results of the study confirmed that class attendance does matter since the effect of lecture attendance is based on fixed-effects and random-effects regression-models. Smith, Pym and Ranchhod (2012) and Van Walbeek (2004) used multiple regression analysis to investigate a selection of variables to determine why some students outperform other students and the results concluded that lecture attendance plays a significant role in determining first-year students' marks. In contradiction, Ramsden (1992) and St Clair (1999) confirmed a negative relationship between students attending lectures and their performance.

Baard et al. (2010, 142) used ordinary least score (OLS) and highlighted two factors considering to influence the success of first-year Accounting students: the higher the class attendance, the greater the chances of success as opposed to students who do not attend lectures, and finally, students' pass rate with no prior accounting knowledge improved their Accounting mark by attending lectures. A few prior studies investigated the relationship between academic performance and prior accounting knowledge including also other explanations of variations in performance inconsistencies. In addition, no studies investigated the relationship between prior accounting knowledge and lecture attendance to address the endogeneity of lecture attendance. Multivariate studies (Rhode and Kavanagh 1996; Eskew and Faley 1988; Farley and Ramsay 1988) indicted that accounting at school level is significantly associated to students' academic performance in the introductory accounting course. The results of these studies were inconsistent with the studies of Baldwin and Howe (1982) and Bergin (2001) that used two groups; prior and no prior accounting knowledge, enrolled for an accounting course. Rankin et al. (2003) and Crawford and Wang (2014) built on the methodology approach of prior studies

to provide a theoretical framework explaining the variation of prior findings and concluded that generally, students with prior high school accounting achieve better in university accounting compared to students without prior high school accounting. Doran, Bouillon, and Smith (1991) used a multivariate predictive model and confirmed that students with secondary school accounting tend to perform better at university level than students with no prior knowledge of accounting at school level. However, in a recent study, Papageorgiou and Halabi (2014) used regression analysis, on three yearly measures of performance with five independent variables with prior accounting knowledge as one of the variable in a distance education accounting degree of 677 students at a South African university. Their study confirmed that prior accounting knowledge concluded to be significantly associated with student performance in their first year of study but not thereafter. This finding was also confirmed by the study of Yee Lee (1999) that also used regression analysis. Gul and Fong (1993) used stepwise regression in analysing a survey completed by Introductory Accounting students during the semester as these students provided their student numbers for matching mid-term and final examination marks and concluded that previous accounting knowledge was a significant predictor of student performance. Uyar and Güngörmüş (2011, 48) used stepwise regression analysis and correlation analysis among variables to investigate the "joint contribution of independent variables on student performance in the financial accounting course". They concluded that prior knowledge and higher lecture attendance, among other factors, are associated with the performances of students registered for a financial accounting course.

METHODOLOGY

This study applied a mixed method; firstly, quantitative and descriptive in nature (Ryan Scapens and Theobald 2002; Leedy and Ormrod 2010; Andrietti 2014). to determine the descriptive statistics and correlation between variables for the sample used in the empirical analysis illustrated in Tables 1 and 2. Secondly, fixed effects regression model (Allison 2009; Andrietti 2014) to account for potential correlation between time-invariant unobservable student traits and the regressor of interest (April, June and September tests and November exam expressed in an attendance rate, representing the amount of lecture attendance per student) used to explain the dependent variable (April, June and September tests and November exam marks, expressed in a percentage scale and is a proxy for academic performance). The fixed effects regression to address the potential endogeneity of attendance was used as illustrated in Tables 3 and 4. Furthermore, a fixed effects regression model was also used to investigate a possible effect of an interaction term between lecture attendance and prior accounting knowledge on student performance as illustrated in Tables 5 and 6.

Participants

The sample selected for this study were 529 first-year full-time Accounting students, a majority (92.1%) registered for the Chartered Accountant and the non-Chartered Accountant degrees (General Commerce) at a South African university. To enrol for both degrees, Mathematics and English are prerequisite school subjects but no prior knowledge of Accounting is required. The South African Institute of Chartered Accountants (SAICA) (SAICA, 2015) states that having Accounting as a school subject could be advantageous when enrolled for an Accounting degree to become a Chartered Accountant, but at most universities Accounting is not a prerequisite subject to enrol for an Accounting degree.

This accounting class was divided into four lecture groups, each of which attended two double periods of 90 minutes each per week. A lecture consists of a 45 minute contact period between students and a lecturer who lectures students on a specific topic as per the Accounting I curriculum set by the academic institution's academic programme. These four groups were exposed to the same lectures, course material and assessments.

Measures and data collection

In the first accounting lecture students were informed by the lecturers to swipe their student cards when entering the Accounting I lecture venue in order for the electronic card system to register their attendances which are to be recorded on a detailed attendance spread sheet (See Figure 1). Students register for their attendance at the beginning of each of the two double periods. The students could attend a maximum of 34 2-period lectures and was divided into four categories, "excellent attendance>=27 lecture attendances", "good attendance = 19–26 lecture attendances", "average attendance = 11–18 lecture attendances" and "poor attendance <=10 lecture attendances". Data was collected over a full academic year from two sources. Data was collected, firstly, from the central computer system of the academic institution for the students' demographics and Accounting I marks (April, June, September tests and November exam), and secondly, from the electronic card readers. This study used an electronic system and not the traditional paper-based systems as used by most lecture attendance studies. In the study of Newman-Ford et al. (2008) an electronic system was used to record lecture attendance. Benefits of using an electronic system are: quick and efficient way for students to register for lecture attendance comparing to the traditional paper-based registrations, no illegible signatures, no impersonation of students in signing the attendance registers and no distraction of passing the attendance register in lectures for students to sign the register. Valuable lecture time is wasted in the administrating of these attendance registers since Bowen et al. (2004)

stated that administration staff spend 40 per cent of their time capturing attendance registers.

Detailed Attendance Report

			Accounting Course Code											Accounting Course Code							
			Lecture Venue A											Lecture Venue B							
			Total	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Total	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)	Date (Time)
Total lecture attendance		**12654**	**3610**	114	115	101	118	100	101	100	104	109	116	**4234**	158	103	159	111	146	112	140
Student number	**Student name**	**Total**	**Attendance**												**Attendance**						
1234	Student 1	**18**	**16**	1	1		1			1	1	1		**2**					1		
1235	Student 2	**24**	**4**	1	1		1							**15**						1	1
1236	Student 3	**12**												**12**							
1237	Student 4	**6**												**6**		1	1	1	1	1	
1238	Student 5	**21**												**21**	1	1	1	1	1	1	
1239	Student 6	**29**	**8**										1	**20**	1		1		1		1
1240	Student 7	**8**												**5**				1	1		
1241	Student 8	**16**	**1**											**15**	1	1	1	1	1		1
1242	Student 9	**25**	**18**	1			1	1	1	1			1	**7**							
1243	Student 10	**25**	**24**	1	1				1	1	1	1		**1**							

Figure 1: Snapshot of detailed lecture attendance report

Data analysis

A spreadsheet was made available to the lecturer including the date of the lecture and details of the students (name, surname, student number and attendance) (See Figure 1: Snapshot of detailed attendance report generated). The two spreadsheets were combined consisting of the demographics, marks and attendance of the students. A software package was used (Statistical Package for the Social Sciences (IBM SPSS Statistics V23)) analysing the data to identify frequencies, relationships and correlations. In the study of Newman-Ford et al. (2008) an electronic system was used to record lecture attendance and a Pearson product–moment correlation coefficient was employed to determine whether any statistically significant relationship between attendance scores and consequent assessment marks exist. Prior correlation studies refer to the causal nature of attendance-performance relationships while this study used descriptive statistics and correlation but the data was further exploited to underpin the theoretical framework which indicates a systematic methodological approach to investigate the causal nature of attendance-performance using fixed effects regression models to address

the endogeneity of attendance. This study employs a methodology similar in the study of Newman-Ford et al. (2008) using the Pearson correlation coefficient and the Spearman rho value to investigate if a relationship between the different variables were significant. The Kruskal-Wallis test and the t-test were performed comparing the scores (of significance) of marks (academic performance) obtained in the tests (April, June and September), the exam and the final marks with lecture attendance, for example Massingham and Herrington (2006) and Paisey and Paisey (2004) used these tests respectively to determine correlations between the different attendance categories versus academic performance. In addition, ANOVA was conducted to test whether the marks' means from the different populations (α=0.05) was used in analysing the differences among the means of the lecture attendance and their associated measures for more than two categories (four categories are: excellent, good, average and poor). MANOVA was performed to determine the effect of lecture attendance on marks obtained in the three tests and the exam. However it differs from employing a multiple regression analysis in a form of an ANOVA and MANOVA to model interactions between the different variables. The multivariate analysis of variances permits the modelling of the different variables' impact across the different categories of lecture attendance. While previous studies employ multiple regression analysis to determine the association between the number of lectures students attend and academic performance (Papageorgiou and Halabi 2014; Smith et. al. 2012; Smith and Ranchhod 2012; Rankin et al. 2003), Andrietti (2014) used proxy variables regression and Andrietti and Veleasco (2015) used different empirical approaches to address the endogeneity of lecture attendance. Data of this study was further exploited to include fixed effects regression models to determine the attendance-performance relationships and whether students with prior accounting knowledge differentially benefit from lecture attendance. Another vital assumption of the fixed effects model is that those time-invariant characteristics should not be correlated with other individual characteristics but are unique to the individual (Allison 2009). The Linear Mixed Model procedure was used to include fixed effects, data was manipulated and restructured to indicate a separate record for each of the test periods (April, June, September and November), per respondent .

RESULTS AND DISCUSSION

The results of the study reports on Accounting I student demographics: 529 first-year degree students were registered for the Accounting I course of whom 61.1 per cent students were registered for the CA degree, 61.4 per cent were African, 19.8 per cent Indian, 16.3 per cent white, and 2.5 per cent "coloured", while 47.6 per cent of the class was female as per Table 1. Nearly 78 per cent of the students who registered for the degree had Accounting as a school

subject. Table 1 reports on the descriptive statistics in understanding the demographics of the accounting students' body.

Table 1: Demographics of Accounting I students

Degree	Frequency	%
Accounting Commerce (CA)	323	61.1
General Commerce	164	31.0
Commerce with Law	12	2.3
Other	30	5.6
Total	529	100.0
Race		
Black	325	61.4
Indian	105	19.8
White	86	16.3
Coloured	13	2.5
Total	529	100.0
Gender		
Female	252	47.6
Male	277	52.4
Total	529	100.0
Accounting as School subject		
Yes	412	77.9
No	117	22.1
Total	529	100.0

Research question 1

"Do lecture attendance of first-year Accounting students matter?" is addressed and illustrated in Tables 2 and 3.

The Kruskal-Wallis test was conducted comparing the scores (of significance) of marks (academic performance) obtained in the tests (April, June and September), the exam and the final marks with lecture attendance. As per Table 3, a statistically significant decrease was observed in the marks from the April test (M=67.31, SD=19.33) to the June test (M=49.93, SD=16.5), and thereafter the marks increased to the final mark (M=58.43, SD=15.26). The Kruskal Wallis test illustrated a statistically difference in the marks scored for the four lecture attendance categories (Excellent > 27+, n=136, Good 19–26, n=241, Average 11–18, n=98, Poor ≤ +10, n=54), χ^2 (3, n=529) =8.419, p=.038 for the April test, χ^2 (3, n=529) = 8.891, p=.031 for the June test, χ^2 (3, n= 29) = 13.932, p=.003, for the September test, χ^2 (3, n=529) = 32.613, p=.000 for the November exam and χ^2 (3, n=529) = 29.019, p=.000 for the final marks. The key finding of the test indicates that the higher the students' lecture attendance the

higher the students' marks in the three tests and exam.

In addition, the Analysis of variance (ANOVA) tested whether the means have different patterns of significance (at $p<0.05$) in analysing the differences among means (means of marks obtained for the three tests and exam) and their associated procedures for more than two groups (currently there are four categories, excellent, good, average and poor). The analysis of the variance was necessary to indicate the different patterns of significance for example; students had a different mean (marks obtained in the tests and exam) in the "Excellent" lecture attendance category than students in the "Poor" lecture attendance category. The results of the tests, the exam and the final marks indicate that the "Excellent" lecture attendance category obtained the highest mean percentage and the "Poor" lecture attendance category the lowest. The results indicated that students who attended ten and fewer lectures failed Accounting I in the June (M=44.96) and September (M=45.13) tests, November exam (M=40.04) and final exam (M=48.02). Students who attended an average of 11 to 18 lectures failed the Accounting I June (M=46.80) and September (M=49.89) tests and the November exam (M=48.91). Students that attended an average of 11 to a maximum of 34 lectures passed Accounting I.

Furthermore, to confirm the significance of the association between the scores of students' academic performance and lecture attendance, Multivariate analysis of variance (MANOVA) was conducted determining lecture attendance mark differences obtained in all the formal assessments. (tests and exam). A MANOVA is used for comparing multivariate means, when there are two or more dependent variables, and is typically followed by significance tests to determine what are the relationships among the dependent variables and independent variables and to establish if changes in the independent variables have significant effects on the dependent variables.

The April, June and September tests, November exam and final marks were used as the dependant variables while the four lecture attendance categories (excellent, good, average and poor) were the independent variables. No serious violations were observed when the preliminary assumption testing was performed to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices and multicollinearity. A statically significant difference was found between the lecture attendance categories for the dependent variables, $F(3, 525)=4.35$, $p=.000$; Wilks' Lambda =.885; partial eta squared =.04. These findings confirmed with the findings of studies in South Africa, United Kingdom, Australia and America. (Smith et al. 2012; Massingham and Herrington 2006; Paisey and Paisey 2004 and Marburger 2001) that increased students' lecture attendance clearly has an effect on students' academic performance.

Table 2: Means for lecture attendance in the different categories of attendance levels for the April, June and September tests, November exam and final mark

		Test			Exam	Final Marks
Number of lectures attended		**April**	**June**	**Sep**	**Nov**	
Poor: ≤10	**Mean**	59.02	44.96	45.13	40.04	48.02
	N	45	45	45	45	45
	SD	23.966	18.477	21.559	25.046	20.796
Average: 11–18	**Mean**	64.20	46.80	49.89	48.91	53.85
	N	107	107	107	107	107
	SD	21.757	17.169	20.623	20.414	16.742
Good: 19–26	**Mean**	69.29	51.27	56.17	57.12	60.61
	N	241	241	241	241	241
	SD	18.184	16.445	17.453	16.638	13.967
Excellent: 27+	**Mean**	69.01	51.68	57.04	58.38	61.64
	N	136	136	136	136	136
	SD	16.545	14.960	14.172	13.889	11.470
Total	**Mean**	67.31	49.93	54.18	54.33	58.43
	N	529	529	529	529	529
	SD	19.327	16.537	18.126	18.499	15.261

As illustrated in Table 3 correlations of less than .3 is normally considered as “no correlation”, since these correlations are interpreted in the sense of forming a pattern. As per Table 3 the correlations of the attendance score with the mark per period, indicates that the strength of this relationship (attendance score with the mark) increases over time from April to November (April, p=.183, June, p=-026, September, p=000 and November, p=000). Thus, one would suspect a significant effect of attendance scores on test and exam marks if the time periods are also used as an effect, which is an indication that exploiting fixed effects regression may be valuable.

Table 3: Correlation between lecture attendance for April, June and September tests, November exam and attendance rate

Test period			**Test Marks**	**Rate of attendance**
November	Test Marks	Pearson Correlation	1	.344**
		Sig. (2-tailed)		.000
		N	529	529
	Rate of attendance	Pearson Correlation	.344**	1
		Sig. (2-tailed)	.000	
		N	529	529
September	Test Marks	Pearson Correlation	1	.206**
		Sig. (2-tailed)		.000
		N	529	529
	Rate of attendance	Pearson Correlation	.206**	1
		Sig. (2-tailed)	.000	
		N	529	529
June	Test Marks	Pearson Correlation	1	.097*
		Sig. (2-tailed)		.026
		N	529	529
	Rate of attendance	Pearson Correlation	.097*	1

Test period			Test Marks	Rate of attendance
		Sig. (2-tailed)	.026	
		N	529	529
April	Test Marks	Pearson Correlation	1	.058
		Sig. (2-tailed)		.183
		N	529	529
	Rate of attendance	Pearson Correlation	.058	1
		Sig. (2-tailed)	.183	
		N	529	529

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The fixed effects regression model was used to exploit the time periods over the academic year since fixed effects factors are generally variables whose values of interest are all represented in the data. Model information criteria are measures for selecting and comparing models; lower values for these criteria indicate the more suitable model to use. The lowest criteria value was selected from the fixed effects model indicating that the original model possibly suffers from omitted variable bias, making regression relying on inter-student (between) variation problematic. While fixed effects regression focusses on intra-student (within) variation. The assumption is that students sitting for a specific test and exam are all exposed to the same circumstances. Thus, if there are unobservable factors that might simultaneously affect both sides of the regression, they are time-invariant. Fixed effects regression exploits within group variance over time. The findings indicate, α=.05, that test period possibly has a significant effect on student performance.

Table 4: Estimates of fixed effects between lecture attendance for April, June and September tests, November exam and academic performance

Estimates of Fixed Effects							
Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	64.664184	.798089	1794.243	81.024	.000	63.098903	66.229465
[period=1 Nov]	-12.308005	.888527	1836.680	-13.852	.000	-14.050634	-10.565376
[period=2 Sep]	-13.470950	.851371	1567.671	-15.823	.000	-15.140897	-11.801004
[period=3 Jun]	-17.088867	.854129	1594.013	-20.007	.000	-18.764201	-15.413534
[period=4 Apr]	0[b]	0	.	.	.	.	.

a. Dependent Variable: Test Marks.
b. This parameter is set to zero because it is redundant.

As per Table 4 the significance values of all the estimates are below .05, indicating a substantial result noticeable on the dependent variable for each period. The April test as the first test was used as a reference and from the estimates indicating that, changing from April to June, the test marks will be 17.09 less than the April test mark, the September test marks will be 13.47 less than the April test mark and the November exam mark will be 12.31 less than the April test mark. Thus there is a decrease in how much the test marks decrease over time relative to the

April test mark. The estimate of the marks was determined and concluded that with every one unit increase of the lecture attendance score and keeping everything else constant, the test mark will increase by 4.88. This model assumes the same intercept for each time period and this intercept (as per Table 4, 64.66) represents the marginal mean of the April test (reference test).

Research question 2

"Do students with prior accounting knowledge differentially benefit from lecture attendance?" Descriptive statistics as per Table 5 illustrates different categories of lecture attendance of students who had (77.9%) prior accounting knowledge and confirms that 82.7 per cent of students who passed Accounting I had Accounting in Grade 12 in comparison to 59.8 per cent of students who had no prior accounting knowledge. The relationship between the three different variables (lecture attendance, prior accounting and pass/fail) was examined by means of the Pearson correlation coefficient and Spearman rho value. The p-value ($p<.01$) indicates a significant association between students' academic performance with and without Accounting in school. This finding of the study confirms the findings of Steenkamp et al. (2009), Van Rensburg et al. (1998) and Rowlands (1988) that prior Accounting knowledge tends to improve student performance. A further independent-samples t-test was performed comparing students' mean score with and without Accounting as a Grade 12 subject and indicates a significant difference in students' scores who had Accounting ($M=60.5$, $SD=13.5$) and those that did not have Accounting ($M=50.7$, $SD=18.6$) prior to university; $t(527)=6.251$, $p<.01$.

If the significant value is less than or equal to .05 it indicates a statistical difference; the t-test conducted indicates, $p<.01$ and confirmed a statistically significant difference between groups (students' prior and no prior accounting knowledge). In conclusion the mean obtained in the final marks for students who had Accounting prior to university ($M=60.5$) was higher than the students' mean with no prior Accounting ($M=50.7$). The outcomes of this study confirm with the outcomes of Papageorgiou and Halabi (2014) and Rankin et al. (2003) that prior accounting knowledge was found to be significantly associated with first-year Accounting students' performance. Furthermore correlation between repeated measured was tested between students with and without prior accounting knowledge and marks obtained in three tests (April, June and September) and the November exam. In Table 5 the repeated measures of test marks' correlations are higher and all positive of the group of students with accounting compared to the group of students without accounting. Additionally, the correlation between the April test mark and the June test mark (.677 and .711) for the two groups respectively – the relationship is stronger for those students without accounting knowledge than for those with accounting knowledge. This is also the case for the association between the April and September test marks,

June and September test marks, June test and November exam marks and for the September test and November exam marks. The reverse is true for the relationship between the April test and November exam marks. In the student group with no accounting, an apparent decrease was found in the correlations' strength together with increasing length of time between the repeated measures, while not visible in the prior accounting knowledge group.

Table 5: Lecture attendance for the full academic year with or without prior accounting knowledge: Pass or fail Accounting I

Accounting as a Grade 12 subject: Yes/No			Total Lecture Attendance				Total
			Poor ≤10	Average 11–18	Good 19–26	Excellent 27+	
Yes	Fail	Count	15	24	22	11	72
		%	3.6%	5.8%	5.3%	2.6%	17.3%
	Pass	Count	20	61	169	95	345
		%	4.8%	14.6%	40.5%	22.8%	82.7%
	Total	Count	35	85	191	106	417
		%l	8.4%	20.4%	45.8%	25.4%	100.0%
No	Fail	Count	6	11	19	9	45
		%	5.4%	9.8%	17.0%	8.0%	40.2%
	Pass	Count	4	11	31	21	67
		%	3.6%	9.8%	27.7%	18.8%	59.8%
	Total	Count	10	22	50	30	112
		%	8.9%	19.6%	44.6%	26.8%	100.0%
Total	Fail	Count	21	35	41	20	117
		%	4.0%	6.6%	7.8%	3.8%	22.1%
	Pass	Count	24	72	200	116	412
		%	4.5%	13.6%	37.8%	21.9%	77.9%
	Total	Count	45	107	241	136	529
		%	8.5%	20.2%	45.6%	25.7%	100.0%

The data was further exploited by using a fixed effects regression model. An independence model based on the assumption that the repeated tests' academic marks are independent was developed and serves as a baseline for comparing the information criteria of other models. Lower values for the information criteria are a clear indication that the random intercepts model provides a better fit for the test data since the variance of the student intercept effect is not zero (Wald Z= 14.345, p<.001) compared to the independence model. Both the intercept term and the regression coefficient of the test period are allowed to vary between subjects in a random intercept and slope model. This model specification resulted in an increase of the information criteria and was abandoned. Fitting a random intercepts for students and fixed-effects for the test period model specification results in lower information criteria values, indicating that this model provides a better fit for the test data than the random intercept and slope model. Both having prior accounting knowledge and the test period have significant effects on test and exam marks. The significance values of all the estimates are below .05, indicating that each period as well as prior accounting knowledge have significant effects on the dependent variable as per

Table 6. Having prior accounting knowledge causes the test mark to increases with 11.32 units relative to not having prior accounting knowledge. The first test in April was used as a reference and the estimates indicate that, the marks of the June test marks will be 17.38 more than the April test mark, the September test marks will be 13.13 more than the April test mark and the November test mark will be 12.98 more than the April test mark. The findings conclude that test and exam marks increase over time relative to the April test mark.

Table 6: Estimates of fixed effects between lecture attendance for April, June and September tests, November exam and prior and no accounting knowledge

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Intercept	81.032054	2.107511	562.825	38.449	.000	76.892507	85.171602
Accounting Yes/No	-11.321305	1.621093	527	-6.984	.000	-14.505904	-8.136707
[period=1 Nov]	-12.982987	.620737	1584.000	-20.915	.000	-14.200538	-11.765435
[period=2 Sep]	-13.130435	.620737	1584.000	-21.153	.000	-14.347986	-11.912883
[period=3 Jun]	-17.381853	.620737	1584.000	-28.002	.000	-18.599404	-16.164301
[period=4 Apr]	0[b]	0	.	.	.	.	.

a. Dependent Variable: Test Marks.
b. This parameter is set to zero because it is redundant.

CONCLUSION

An investigation was launched to establish the impact of students attending lectures on students' marks and whether these students with prior accounting knowledge differentially benefit from lecture attendance enrolled for a degree in accounting degree. A different approach was used in determining a more systematic review on different empirical techniques to address the endogeneity of lecture attendance as opposed to traditional correlation studies. Firstly, correlations were established between variables and thereafter data was further exploited using regression analysis confirming that fixed effects regression exploits within group variance over time to institute an instrumental link between lecture attendance and academic performance as well as establishing a simultaneous relationship of lecture attendance and prior accounting knowledge with student performance.

Correlation results indicated that excellent to good lecture attendance and prior accounting knowledge are important as one of many factors influencing academic performance, in higher education that contribute to students' academic performance. Furthermore the results reported that lecture attendance applies a significant influence on first-year accounting students' academic marks and eventually throughput rate. A correlation of the final marks in Accounting I increased proportionally with lecture attendance. These findings are supported by the findings Uyar and Güngörmüş (2011) and Paisey and Paisey (2004) that lecture attendance is

significantly positively related to student performance. It was necessary to test this occurrence not only to confirm that lecture attendance must be included as a factor that has an impact on lecture attendance but also to create awareness among students as to why lecture attendance is important and why some students fail or underperform in accounting. In addition this study's findings also confirm with other countries studies' findings; United Kingdom (Gill et al. 2011; Paisey and Paisey 2004; Newman-Ford et al. 2008; Gbadamosi 2015), Australia (Rodgers and Rodgers 2003; Massingham and Herrington 2006) and America (Devadoss and Foltz 1996; Turkey et al. 2012; Marburger 2001) that lecture attendance correlates positively with academic performance. South African studies Smith et al. (2012), Thatcher et al. (2007), Van Walbeek (2004), Steenkamp et al. (2009) and Baard et al. (2010) concluded that lecture attendance had a positive and significant effect on students' marks. Data was further exploited in using fixed effect regression model and when account for time-invariant results confirmed that test and exam marks increase over time relative to the April test mark. Therefore, the data was viewed as longitudinal, since each student is tested four times at regular intervals (April, June, September, and November) during the academic year. Thus, attendance in each time period leading to the exam relates to student performance. The overall findings of attendance-performance confirmed that students may increase their academic performance by attending lectures; higher lecture attendance results in higher marks.

Continuous debate arises about accounting as a pre-requisite subject for enrolling for an accounting degree. Due to inadequate data resulting in no or little research is still lacking in Southern Africa. This study is a first step towards filling the gap in exploiting not only correlation between lecture attendance and prior or no prior accounting knowledge but using fixed effects regression models to do so. The correlation between variables confirmed that students with prior accounting knowledge outperform students who have not previously taken accounting at school when they attend the same number of lectures. Furthermore, this study also emphasises the importance of accounting that could be added to the list as a pre-requisite for the admission requirements to an accounting degree. Previous research confirmed that students' pass rate with no prior accounting knowledge was improved by attending lectures (Baard et al. 2010, 142) while other studies confirmed a significant association between students with prior accounting knowledge and students' marks (Rohde and Kavanagh 1996; Farley and Ramsay 1988; Papageorgiou and Halabi 2014; Eskew and Faley 1988). The studies of Uyar and Güngörmüş (2011), Van Rensburg et al. (1998) and Rowlands (1988) confirmed that prior Accounting exposure tends to improve student performance. The results of the fixed effects regression model confirmed that a decrease was found in the correlations' strength together with increasing length of time between the repeated measures, while not visible student

group with accounting. Some students who did not take Accounting as a school subject believe that they were not disadvantage from passing accounting in their first year compared to students who did take Accounting at school (Rankin et al. 2003). Furthermore, students who had prior accounting knowledge before enrolling for the Accounting course felt that they did not have to attend lectures on a regular basis as they trust school Accounting would provide them with sufficient knowledge to pass Accounting I. The overall findings confirm that there is an increase in the correlation's strength between students' prior accounting knowledge and academic performance together with the duration of the test period confirm positive significant effects on students' marks.

This study not only validated the researcher's belief as to why lecture attendance is important but, it is hoped, it will also create an awareness among first-year Accounting students as to why lecture attendance is one of many factors that could influence students' academic marks. This study contributes to accounting education by validating prior studies' results relating to the importance and impact of students' lecture attendance on accounting students' academic performance. Furthermore, the study extends its contribution on the influence of accounting as a Grade 12 subject when students enrol for an accounting degree that could improve students' results in their primary year of study. The adaptation from school to higher education could be stressful period for some first year university students but this transition period could be less demanding if accounting students had accounting as a school subject and probably pass accounting compared to accounting students that did not have prior accounting knowledge (Steenkamp et al. 2009).

This study is constrained to a university in South Africa using accounting students in their first year. Furthermore, other limitations are; other factors which could have an influence on lecture attendance were not investigated and not included in the study. Also, academic marks other than tests and final examination could be included for example, projects and tutorial tests and finally tutorial attendance could be included to determine the overall impact of students' lecture and tutorial attendance on students' marks.

Despite the limitations, this article makes several unique contributions. Firstly, further research could add value by identifying other reasons or factors not limited to the factors used in this study which could affect students' performance. Secondly, this study could be replicated on data from other academic institutions. Thirdly, this study could be prolonged to establish whether accounting as a school subject could be a pre-requisite subject for students enrolling for an accounting degree at an academic institution and finally the findings of the study could assist high school counsellors/advisors to advise scholars who wish to pursue an accounting degree.

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