Journal of Academic Writing
Vol. 4 No. 1 Spring 2014, pages 12-25

Academic Writing Workshops: Impact of Attendance on Performance

Chinny Nzekwe-Excel
Aston University, England

Abstract

The purpose of this study is to explore if academic writing workshops contribute to students' learning and performance in assessment. Academic writing workshops provide an opportunity to discuss specific learning areas and promote student engagement. The results of an assessed essay for a group of 65 first-year mathematics students at Aston University, UK show that academic writing workshops have an association with students' academic performance. An Independent Samples T-test was conducted to compare the mean performance of the students based on their attendance of academic writing workshops. The analyses reveal that students who attended 2-5 academic writing workshops had a far better performance (mean: 58.60%) in comparison to students who attended 0-1 workshop (mean: 46.37%). In addition, the analyses show a statistically significant difference in the mean performance of students who attended and of students who did not attend an academic writing workshop specifically relating to the assessment.

Introduction and Study Context

Academic writing is a formal writing style that conforms to a set of conventions in presenting ideas and viewpoints on a particular topic. It goes beyond adequate academic referencing or the use of evidence; thus it also involves analytical/critical thinking, objectivity, and appropriate presentation (style, grammar, layout and structure). Therefore, academic writing is not just required within the university environment or by professionals in the literacy field; it is a skill that needs to be developed and improved upon in students, irrespective of their field of study. This is because writing skills develop students' communication and reasoning ability (Wingate 2007, Fallon 2009, Nzekwe-Excel 2009 and Kwaku *et al.* 2010). Within the Higher Education (HE) context, academic writing teaching may be delivered through lectures, workshops or a combination of the two. Specifically, academic writing workshops (AWWs) are teaching sessions usually delivered as add-ons to lecture teaching sessions. They provide an atmosphere to focus on and discuss specific learning areas relating to academic writing. In addition, AWWs promote tutor/student participation and student engagement. The AWWs discussed in this study are focussed on orientation and approaches to learning in the HE environment and the features of academic writing.

Purpose of this Study

The role or significance of academic writing workshops can be drawn from research on the impact of writing centres on the academic development of students in HE; writing centres support students in their academic development and achievements through writing tutorials and workshops (Magin and Churches 1995, Bailey *et al.* 2007, Yeats *et al.* 2010 and Nzekwe-Excel 2011). A study by Yeats *et al.* (2010) shows that on average, a higher percentage of students who attended writing tutorials progressed (95.6%) in comparison to students who did not attend (85.3%). Thonus (2001 and 2002) argues that writing centre tutorials are essential

steps towards writing development. Applying writing tutorial and workshop pedagogy to the discipline of Mathematics, the study reported in this article explores and discusses the impact of AWWs on the performance of a group of first-year Mathematics students.

Participants and Study Scenario

The sample used for this study comprised 65 out of 72 undergraduate mathematics students who were enrolled in a Communication/Academic Writing Skills module in the first semester of their first-year study. The aims of the module are to enhance students' self-study skills, and to enable them to consolidate and improve their skills in written and oral communication as well as prepare them for effective participation in professional placements. The module is delivered using a combination of lecture and workshop teaching methods. For the purpose of this study, focus is placed on the workshop teaching sessions. The workshops were managed and facilitated by one English teaching instructor and one Learning Development/ Mathematics teaching instructor, and required the 72 students to be split into two groups: 36 in Group 1 and 36 in Group 2. While one teaching instructor taught Group 1, the other instructor taught Group 2 at the same time. In the following week, while instructor 1 taught Group 2, instructor 2 taught Group 1. The workshops, which are five in total, as shown in Figure 1 later in this article, discussed issues of orientation to learning in HE, different approaches to learning, and features of academic/report writing. The module specification required the students to submit an essay at the end of the five workshops.

The first workshop, titled 'Orientation to Learning in HE', focussed on discussing different teaching methods and styles used in HE, and elements of independent and self-directed learning. The second workshop was devoted to discussions on assessment criteria and expectations from lecturers. The third workshop focussed on exploring different learning approaches and strategies for developing critical writing skills. The fourth workshop discussed the essence of referencing and explained different forms of plagiarism and how to avoid it. The fifth workshop addressed the importance of active reading, steps to reading critically, and tactics for making effective notes.

Assessment: essay assignment

The essay assignment primarily required the students to analyse the nature of plagiarism and collusion and evaluate ways in which both can be avoided and detected. It was given to the students at the start of the module. The students were expected to submit the assignment in the sixth teaching week (when they had attended five of the afore-mentioned AWWs). Seven students failed to submit their essay assignment (and were given a zero score). In view of this, the 7 students are not considered in this study, resulting in a total of 65 students considered usable in this study.

Data set used in this study

The data set used in this study represents data from the attendance of the 65 students to the five AWWs and performance of the students on the essay following attendance of the AWWs. To ensure appropriate ethical process and confidentiality, the students' identities are kept anonymous.

Method and Analytical Approaches Adopted for Study

This study explores the students' performance on the essay assignment following their attendance of the five AWWs. For the purpose of this study, the students' performance is viewed in the context of their actual percentage scores in the essay assessment. The analyses and discussions, presented in the next sections, are based on the following questions:

- Is there a relationship between the students' attendance at the AWWs and the students' performance?

- Does performance on the essay assessment differ for students who attended the 'referencing and plagiarism' workshop and students who did not?
- Does performance on the essay assessment differ for students based on the number of AWWs attended?

Measure of association between academic writing workshop attendance and students' performance

An investigation was carried out on the data (the students' essay scores and the number of AWWs attended by each student) to examine the pattern of relationship between the essay scores or student performance and number of AWWs attended by the students. A scatter plot was employed for this purpose. Subsequently, a correlational analysis was carried out to identify the strength and significance of the relationship between workshop attendance and the students' essay scores. This was measured using the Pearson's correlation statistic: an analytical approach used to explore the linear relationship between two variables measured on an interval or ratio scale.

Evaluation of student performance based on number of academic writing workshops attended

Analysis was first carried out on the significance of the performance of students who attended the 'Referencing and Plagiarism' workshop (Workshop4) using an Independent Samples T-test. The Independent Samples T-test is an inferential statistics used to test whether there is a significant difference in the mean values on an interval or ratio data of two categories on an ordinal or nominal data. Further analysis was conducted on the students' performance by grouping their essay scores under six categories based on the number of AWWs attended. These categories include 0AWW, 1AWW, 2AWW, 3AWW, 4AWW, and 5AWW. Data regarding student attendance of AWWs was further categorised under two groups (0-1 AWW and 2-5 AWW) based on the level of substantial overlap and significant difference between the different categories (discussed later in this article). Therefore, by adopting the Independent Samples T-test, analyses were carried out on the statistical significance of AWW attendance (0-1 AWW and 2-5 AWW) on students' performance.

Analysis and Discussion

The evaluation of the students' performance in the essay, which is presented in the following sub-sections, explores whether the AWWs contributed to the students' performance.

Frequency of student attendance at the academic writing workshops

With respect to the number of students who attended each of the five AWWs, as shown in Figure 1, the second workshop ('Learning Process at University') recorded the highest percentage of student attendance (47 students) while the workshop on 'Referencing and Plagiarism' recorded the lowest percentage of student attendance (14 students).

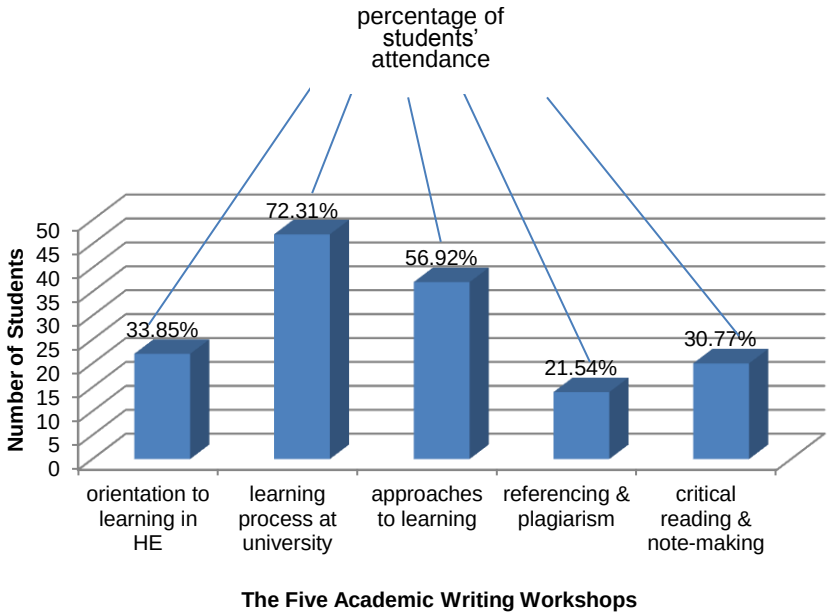

Figure 1. Percentage Attendance of Students for the Five Academic Writing Workshops

An evaluation of the rate of attendance to the AWWs shows a decrease from Workshop2 to Workshop4 and a slight increase in Workshop5. Notwithstanding that the essay question was on 'plagiarism', the workshop on 'Referencing and Plagiarism' (Workshop4) recorded the least number (14) in student attendance. It is not surprising to have a progressive decline in the workshop attendance; this is 'probably' because as the students become occupied with workloads of assignments, laboratory sessions, and lectures, they choose not to attend the AWWs, which are usually designed as non-assessed elements of modules. Sadly, this ought not to be the case considering that workshops provide an atmosphere for students to further understand what has been introduced/taught in their lecture sessions, as well as an atmosphere for consolidating their learning process.

Frequency of the students' attendance and performance in essay assignment

Results of the students' performance in the essay assignment recorded twelve percentage score points with the highest percentage score as 70% and the least score as zero. Results of the analyses show that 46 students achieved 50% and above while 19 students achieved below 50%. However, a score of 40% and above indicates a 'pass' mark for the essay; 60 students achieved a 'pass' mark. Details of the frequency of number of students with each percentage score point are shown in Figure 2. The 60% essay score was achieved by the greatest percentage of students (15 students) while 0, 20%, and 35% were achieved by the least percentage of the total number of students (1 student on each of the three score categories).

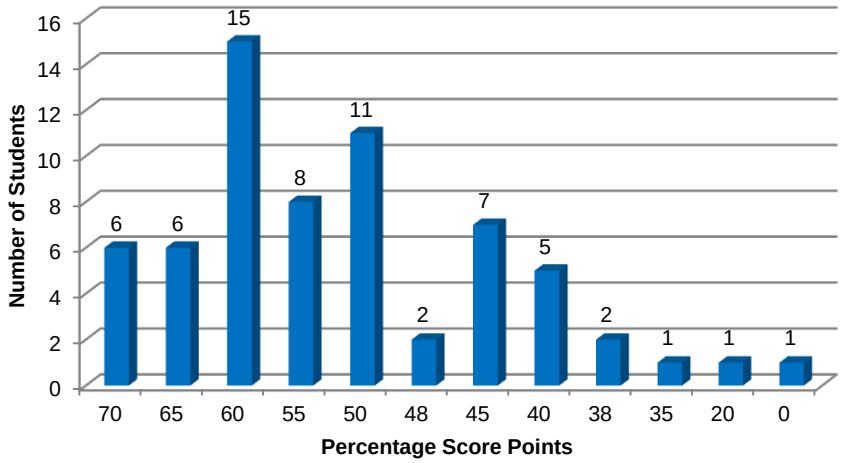

Figure 2. Frequency Distribution of Students with the Different Percentage Score Points

Relationship between Academic Writing Workshop Attendance and Student Performance

The different essay scores or students' diverse performance, with a significant number of students (60) achieving a 'pass', flagged the need to explore the association between AWWs and students' performance, and subsequently to explore the students' attendance of the AWWs in relation to their performance. Results of the scatter plot, as shown in Figure 3, show some pattern of relationship between the students' performance and number of AWWs attended.

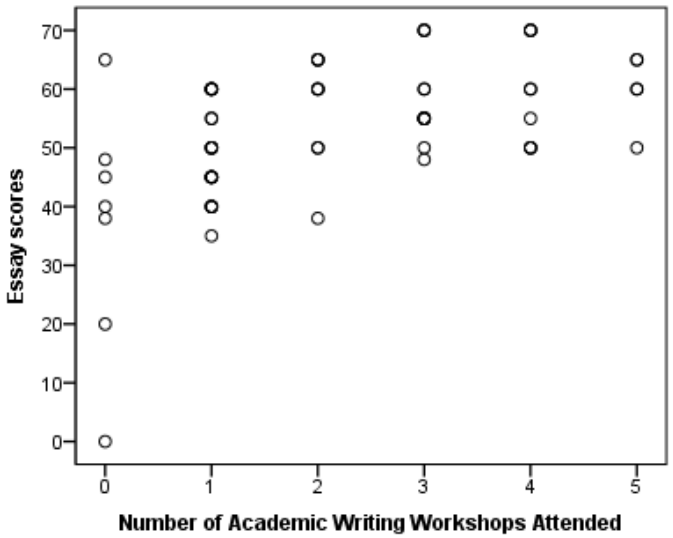

Figure 3. Scatter Plot of Relationship between Students' Essay Scores and Workshop Attendance

A careful investigation of the scatter plot (Figure 3) shows that the values (essay scores and workshop attendance) tend to rise from the bottom left to the top right corner of the plot. This indicates a positive and slightly linear relationship between workshop attendance and essay scores.

A correlational analysis carried out to further explore the significance of the relationship between workshop attendance and the students' essay scores/performance, show that there is a moderate positive correlation/relationship between workshop attendance and students' performance (Table 1).

Table 1. Correlation Analysis of Students' Performance (Essay Scores) and Workshop Attendance

		Essay Scores/Student Performance
Workshop attendance	Pearson's	**0.517****
	Sig.(2-tailed)	0.000

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

The correlation analysis shows that 'essay scores/student performance' relate significantly to 'workshop attendance' with a correlation coefficient, r, of 0.52 and a significant probability value, p=0.001, that is p<0.01. The p value indicates that there is a very small chance (0%) that the relationship (correlation) between students' performance and workshop attendance occurred as a result of sampling error. The correlation results suggest that the more a student attends AWWs, the more likely it is that the student will perform better in academic writing assignments. Similar results can be seen in a study by Bailey *et al.* (2007), which reported a 0% failure rate on assessment and an improvement in academic grades for all students who attended one or more of the 4 writing skills sessions. The r^2 value (0.27), which is r * r (0.52 * 0.52 = 0.27), highlights the percentage of the variation in student performance that can be accounted for by the variation in the workshop attendance. This is to say that 27% of the variation in the essay scores can be accounted for by the variation in the workshop attendance.

Performance of Students who attended the Referencing and Plagiarism Workshop

Given that the essay question was primarily on 'plagiarism', it was necessary to explore the performance of the 14 students who attended Workshop4 ('Referencing and Plagiarism'). As shown in Table 2, all 14 students achieved 50% and above in the essay, with a mean score of 62.86%.

Table 2. Performance of Students who Attended the Referencing and Plagiarism AWW

Student	Essay Score	Total Number of AWWs attended (including Workshop 4)
Student 1	50	5
Student 2	60	5
Student 3	70	4
Student 4	70	4
Student 5	70	3
Student 6	60	2
Student 7	65	5
Student 8	65	2
Student 9	50	4
Student 10	65	5
Student 11	60	1
Student 12	60	5
Student 13	65	2
Student 14	70	3
Mean Essay Score	**62.86**	

Consequently, the Independent Samples T-test was employed to identify if there is a significant difference between the mean performance of the 14 students who attended the 'Referencing and Plagiarism' workshop and the remaining 51 who did not. Prior to choosing

the Independent Samples T-test, the suitability of the data was first checked for conditions for using a parametric test. Precisely, the conditions for equality of variance and symmetric distributions were first verified prior to selecting the T-test as the most appropriate test to evaluate the hypothesis that students who attend the AWW specifically relating to assessment would achieve a higher and better performance, on average, than students who do not attend the AWW (Tables 3 and 4).

Table 3. Group Statistics of Students Who Attended and Students who did not Attend Referencing and Plagiarism Workshop

Groups	N	Mean	Std. Deviation	Median
Students who attended Referencing and Plagiarism workshop ('attendee group')	14	**62.86**	6.712	65
Students who did not attend Referencing and Plagiarism workshop ('non-attendee group')	51	**50.24**	11.953	50

Table 4. Independent Samples T-test

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Essay_ Scores	Equal variances assumed	1.797	.185	**3.777**	**63**	**.000**	**12.622**	3.342	5.944	19.300
	Equal variances not assumed			5.145	37.996	.000	12.622	2.453	7.655	17.589

Results of the T-test show that the mean value for students who attended Workshop4 is higher (62.86) than the mean value of students who did not attend (50.24) (Table 3), suggesting a significant difference in the students' performance in the two groups. In addition, students who attended Workshop4 had higher essay scores (median=65) than students who did not attend (median=50). Subsequently, the test statistics results: $t=3.777$, $df=63$, $p<0.05$, two-tailed (Table 4), indicate a significant difference between the two groups, signifying that students who attended the AWW relating to assessment outperformed students who did not attend. In addition, the p value (0.001) indicates that there is 0% chance that the higher score performance in the 'attendee' group is due to sampling error. Furthermore, the absence of overlap between the two groups indicates a very large effect size and the presence of a significant difference between the two groups (Figure 4).

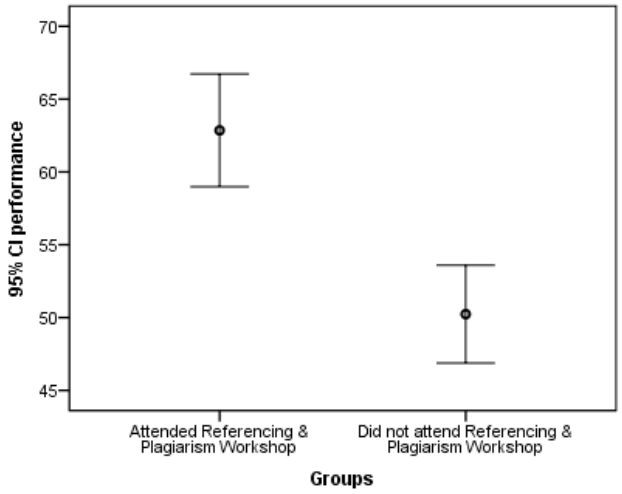

Figure 4. 95% Confidence Intervals for Mean Values of Student Performance on Attendance/Non Attendance of Referencing and Plagiarism Workshop

Performance of Students and Number of Academic Writing Workshops Attended

The five AWWs are inter-linked as they were generally focussed on different approaches to learning and academic writing conventions within HE, suggesting that each workshop was intended to have some effect on the essay assignment. Thus and as mentioned earlier, the students' essay scores were grouped into six categories of AWW attendance; this was done to enable a clear investigation of the students' performance with reference to number of the AWWs attended. Figure 5 shows that more than 35% of the 65 students (23 students) attended only 1 of the AWWs while only 5 students attended all 5 AWWs.

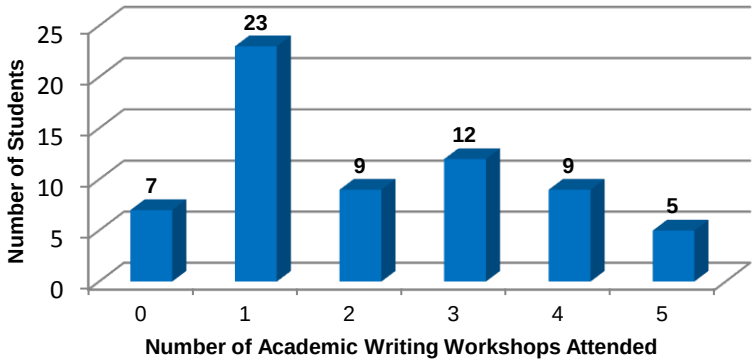

Figure 5. Frequency Distribution of Students and Number of AWWs attended

Table 5 shows the number of AWWs attended by the students and the essay scores (students' performance) associated with the number of AWWs attended.

Table 5. Number of AWWs Attended and Students' Essay Scores

	0 AWW (%)	1 AWW (%)	2 AWW (%)	3 AWW (%)	4 AWW (%)	5 AWW (%)
	0 – 2 AWWs			3 – 5 AWWs		
	48 38 65 0 40 45 20	50 40 40 45 50 50 55 45 45 60 60 35 60 60 55 45 45 50 40 40 60 60 45	60 60 65 65 38 50 60 50 65	**70** 48 **70** 55 60 55 55 55 50 55 60 **70**	60 **70** 50 55 **70** 60 50 **70** 50	50 60 65 65 60
N	7	23	9	12	9	5
N (%)	10.8	35.4	13.8	18.5	13.8	7.7
Mean Score (%)	36.57	49.35	57	58.58	59.44	60

It is not surprising to observe that all the students (6) who scored 70% (maximum score) attended 3 to 5 AWWs, as shown in Table 5. On the contrary, the one student who scored zero attended 0 AWW. In addition, 4 out of the 5 students who achieved a 'fail' (0 to 39%) for the essay attended 0 or 1 AWW while the fifth student attended 2 AWWs. Furthermore, the results indicate that 25 out of the 26 students who attended 3 to 5 AWWs achieved 50% and above; it is important to note that the remaining 1 student still achieved a 'pass' (essay score: 48%).

With respect to the mean performance of the students based on the six categories of AWW attendance, the results (Table 5) show that the mean score tends to improve significantly as the number of AWWs attended increases. For instance, the mean score of students in the 2AWW category (57%) is higher than the mean score of students in the 1AWW category (49.35%). Similarly, the mean score of students in the 5AWW category (60%) is higher than the mean score of students in the 3AWW (58.58%) and 4AWW (59.44%) categories.

Confidence Intervals (CIs), which are graphically explored using error bars (Figure 6), are computed to provide an overview of the range of the students' essay scores, which again is based on the six AWW categories. As shown in Figure 6, the means of the different categories are displayed as the points (thick dots) in the middle of the lines while the CIs are represented by the vertical line that goes through the mean points.

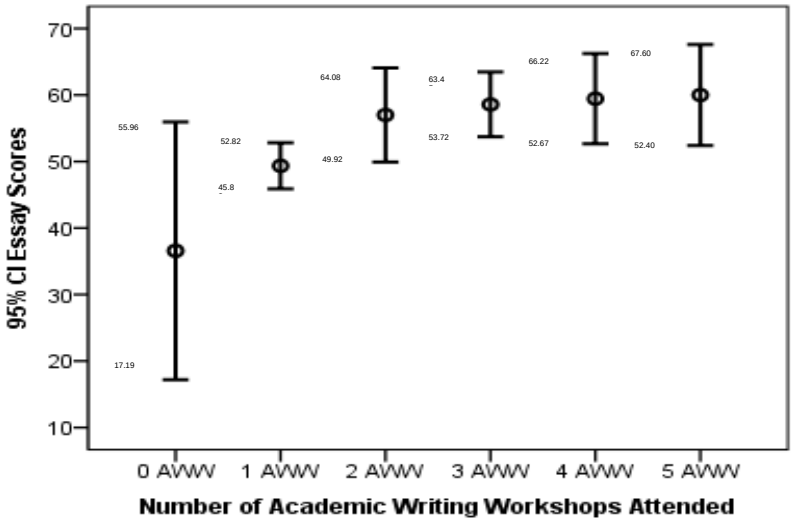

Figure 6. 95% Confidence Intervals for the Mean Values of the Six Categories of AWW Attendance

The error bars indicate that there is 95% confidence that the population means of the different AWW attendance categories (0, 1, 2, 3, 4, and 5) have essay scores within the intervals shown on the bars. Generally the CI results show that the confidence limits tend to increase significantly and then gradually as the number of AWWs attended increase. Thus, the CI computations show that there is a 95% chance that students with lower AWW attendance (for example, 1AWW category with a mean essay score falling between 46% and 53%) would likely have lower performance than students with higher AWW attendance (for example, the 4AWW category has a mean essay score falling between 53% and 66%).

Furthermore, the error bars highlight the presence of overlap between different sets of CIs, with certain AWW attendance sets having more overlap amongst each other. For instance, there is substantial overlap in the students' performance between 0 and 1AWW attendance categories; there is also substantial overlap between 2, 3, 4 and 5AWW attendance categories. The presence of such overlapping CIs suggests that there is likely no *particular difference* between the mean performance of students with attendance of 0 and 1AWWs; and 2, 3, 4 and 5AWWs. There is little or some level of overlap between the CIs (mean performance) of students with 0 and 2AWW; 0 and 3AWW; 0 and 4AWW; 0 and 5AWW; 1 and 2AWW; 1 and 3AWW; 1 and 4AWW; and 1 and 5AWW attendances indicating the presence of some difference between the mean values of the two individual data sets. The substantial overlap between the afore-mentioned individual data sets indicates very minimal effect size between the 0 and 1 AWW, 2 and 3 AWWs, 2 and 4 AWWs, 2 and 5 AWWs, 3 and 4 AWWs, 3 and 5 AWWs, and 4 and 5 AWWs. However, large effect size is present between the mean essay scores of 0 and 2, 0 and 3, 0 and 4, 0 and 5 AWWs; and 1 and 3 AWWs, 1 and 4 AWWs, 1 and 5 AWWs. Effect size is the 'magnitude of difference between conditions' (Dancey and Reidy 2004: 239).

In view of the minimal or substantial overlap between the different data sets, the Mann Whitney U test was therefore employed to investigate if there is a genuine difference between the different individual data sets. The Mann Whitney U-test is a non-parametric statistical approach that compares the mean ranks and subsequently explores the significant/non-significant difference between two independent data sets. The non-parametric U test was employed as an alternative to the parametric T-test because of the violations of conditions for equality of variance and symmetric distributions for most of each of the two data sets. Results of the U tests show corresponding statistical significance and non-significance for the individual data sets (Table 6).

Table 6. Significant and Non-Significant Differences between Different Sets of AWW Attendance Categories

Group	N	Mean Rank	Sum_of_Ranks	Mann_Whitney U	Z	Asymp.Sig (2-tailed)	Exact Sig[2*(1-tailed Sig.)]
0AWW	7	10.57	74.00				
1AWW	23	17.00	391.00	46.000	-1.715	0.086	0.096
0AWW	7	5.57	39.00				
2AWW	9	10.78	97.00	11.000	-2.196	0.028	0.031
0AWW	7	5.36	37.50				
3AWW	12	12.71	152.50	9.500	-2.779	0.005	0.004
0AWW	7	4.86	34.00				
4AWW	9	11.33	102.00	6.00	-2.717	0.007	0.005
0AWW	7	4.57	32.00				
5AWW	5	9.20	46.00	4.000	-2.212	0.027	0.030
1AWW	23	14.22	327.00				
2AWW	9	22.33	201.00	51.000	-2.243	0.025	0.027
1AWW	23	14.74	339.00				
3AWW	12	24.25	291.00	63.000	-2.645	0.008	0.008
1AWW	23	13.87	319.00				
4AWW	9	23.22	209.00	43.000	-2.582	0.010	0.010
1AWW	23	12.70	292.00				
5AWW	5	22.80	114.00	16.000	-2.542	0.011	0.010
2AWW	9	11.00	99.00				
3AWW	12	11.00	132.00	54.000	0.000	1.000	1.000
2AWW	9	9.00	81.00				
4AWW	9	10.00	90.00	36.000	-0.408	0.684	0.730
2AWW	9	7.11	64.00				
5AWW	5	8.20	41.00	19.000	-0.491	0.623	0.699
3AWW	12	10.79	129.50				
4AWW	9	11.28	101.50	51.500	-0.183	0.855	0.862
3AWW	12	8.54	102.50				
5AWW	5	10.10	50.50	24.500	-0.593	0.553	0.574
4AWW	9	7.39	66.50				
5AWW	5	7.70	38.50	21.500	-0.137	0.891	0.898

Sig value ≥ 0.05 indicates non-significant difference, while a sig value < 0.05 indicates significant difference

Nzekwe-Excel (2011) noted that students who attended one or none of an academic writing workshop performed lower, on average, than students who attended up to four or five of the academic workshops. In addition, considering the above CI computations: presence/absence of substantial overlap and large/minimal effect size, and results of the Mann Whitney U tests, attendances were divided into two categories: '0-1' AWW and '2-5' AWWs. The Independent Samples T-test was then employed to measure if there is a significant difference in the performance of the students based on the two categories.

Independent Samples T-test

The suitability of the data was first checked for conditions for using parametric test: the conditions for equality of variance and symmetric distributions were verified prior to selecting the Independent Samples T-test as the most appropriate test for evaluating the hypothesis that students who attend '2-5' AWWs would achieve a higher and better performance, on the average, than students who attend '0-1' AWW on a given essay question.

First, it became necessary to identify the variables or data sets (grouping and test variables) required to ensure that the assumptions of the T-test are adequately met; and subsequently verify that the data sets are continuous distributions with similar shape. The AWW attendance is the grouping variable and it has two levels, which are '0-1', and '2-5' groups. The students' performance, known as the test variable, yields essay scores which range in value from 0 to 70.

The mean values of the two groups (Table 7) show that students who attended '2-5' AWWs performed better than students who attended '0-1' AWW on average indicated by the higher mean value of 58.60 for the former. The mean values in relation to the SDs of the two groups suggest that on average the students had a performance between 33% and 59%, and 51% and 66% for the '0-1' and '2-5' AWW attendance groups respectively. This indicates that there are chances of some students in the '0-1' group achieving a 'fail', and all students in the '2-5' group achieving a 'pass'.

Table 7. Mean Values of '0-1' and '2-5' AWW Groups

	Groups (AWW)	N	Mean	Std. Deviation	Std. Error Mean
Essay Scores	"0 – 1"	30	**46.37**	13.034	2.380
	"2 – 5"	35	**58.60**	7.923	1.339

Subsequently, results of the T-test were significant as expected, t=-4.644, df=63, p<0.05, two-tailed (Table 8). Results of the test show that the mean difference between the two AWW attendance groups ('0–1' and '2–5') was -12.23 and the 95% CI for the estimated population mean difference lies between -17.50 to -6.97. In addition, the p value (0.001) suggests that there is 0% chance that the higher score performance in the '2-5' AWW attendance group is due to sampling error. Furthermore, outcomes of the effect size computations (equation 1) show very large effect size between the two groups (1.17), which suggests very little or no percentage of overlap between the two groups. The absence of overlap between the two groups is graphically represented using error bars (Figure 9).

Table 8. Independent Samples T-test

		Levene's Test for Equality of Variances		T-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Conf Interval of the Difference	
									Lower	Upper
Essay Scores	Equal variances assumed	1.928	.170	-4.644	63	.000	-12.233	2.634	-17.497	-6.969
	Equal variances not assumed			-4.480	46.316	.000	-12.233	2.731	-17.729	-6.738

$$Effect\ Size = \frac{Mean(`2-5`group) - Mean\ (`0-1`group)}{Mean\ [Standard\ deviation(`2-5'group) and\ Standard\ deviation(`0-1'group)]} \quad \text{....eqn (1)}$$

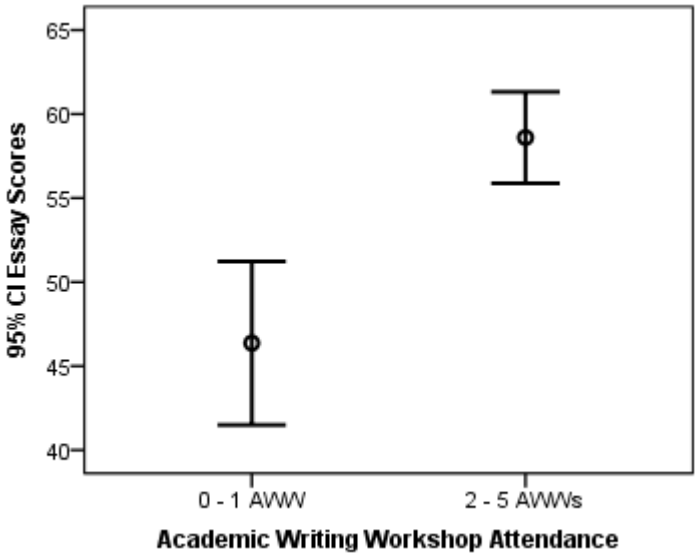

Figure. 9 Error Bars Showing Absence of Overlap between '0-1' and '2-5' Groups

Conclusion

The outcomes from this study showed a strong pattern of linear relationship between academic writing workshop attendance and students' performance in assessment. The correlation analysis indicates a significant positive relationship between writing workshop attendance and the students' performance ($r=0.52$; $p=0.001$). In addition, the T-test analyses show that, on average, students who attended two or more of the academic writing workshops performed better than students who attended one or none of the writing workshops, as indicated by the respective mean performance of 58.60 and 46.37. The outcomes from this study also show a significant difference in the performance of students who attended the academic writing workshop specifically relating to the assessment question to the performance of students who did not attend the workshop. Therefore, the importance of academic writing workshops (and attendance of them) needs to be actively promoted to students in terms of their relevance and impact on students' academic achievements and capacity to learn.

Further analyses are currently being carried out to identify the performance of students based on specific workshops and the implications behind this. In addition, the analyses and discussions presented in this article create the need to further explore how lecture teaching sessions in comparison to writing workshop sessions impact on the progressive performance of students.

Acknowledgement

Special thanks to Robert Fox, Teaching Associate (English Language and Communication) and Co-Director of Pre-Sessional English Programmes, Aston University for supplying the data for the First-year undergraduate Mathematics students used in this study.

References

Bailey, P., Derbyshire, J., Harding, A., Middleton, A., Rayson, K. and Syson, L. (2007) 'Assessing the Impact of a Study Skills Programme on the Academic Development of Nursing Diploma Students at Northumbria University UK'. *Health Information and Libraries Journal* 24 (Supp1), 77-85

Dancey, C.P. and Reidy, J. (2004) *Statistics without Maths for Psychology: Using SPSS for Windows*. 3rd edn. Essex: Pearson Education Limited

Fallon, H. (2009) 'A Writing Support Programme for Irish Academic Librarians'. *Library Review* 58 (6), 414-422

Kwaku Adu-Gyamfi, K., Bossé, M.J. and Faulconer, J. (2010) 'Assessing Understanding through Reading and Writing in Mathematics'. *International Journal for Mathematics Teaching and Learning,* paper 205

Magin, D.J. and Churches, A.E. (1995). 'Peer Tutoring in Engineering Design: A Case Study'. *Studies in Higher Education*, 20 (1), 73-86

Nzekwe-Excel, C. (2009) 'The Role of Student Skills and Learning Development on the Student's Learning Experience'. *4th International Inquiring Pedagogies* (*IPED) Conference: 'Researching Beyond Boundaries', Academic Communities without Borders.* 14-15 September 2009 at Coventry University, Newcastle Upon Tyne: Cambridge Scholars Publishing, 171-172 available from <http://cuba.coventry.ac.uk/iped2009/nzekweexcel/> [31 January 2014]

Nzekwe-Excel, C. (2011) 'Impact of Academic Writing Sessions on the Performance of Mathematics Students'. Poster Presented at *the 6th European First Year Students Conference*. 19-20 June 2011 at the University of Manchester

Thonus, T. (2001) 'Triangulation in the Writing Centre: Tutor, Tutee and Instructor Perceptions of the Tutor's Role'. *The Writing Centre Journal* 21, 57-82

Thonus, T. (2002) 'Tutor and Student Assessments of Academic Writing Tutorials: What is "Success"?' *Assessing Writing* 8, 110-134

Wingate, U. (2007) 'A Framework for Transition: Supporting 'Learning to Learn' in Higher Education'. *Higher Education Quarterly* 61 (3), 391-405

Yeats, R., Reddy, P., Wheeler, A., Senior, C. and Murray, J. (2010) 'What a Difference a Writing Centre Makes: A Small Scale Study'. *Journal of Education and Training* 52 (6/7), 499-507