

CLASS ATTENDANCE AND ACADEMIC PERFORMANCE OF SECOND YEAR UNIVERSITY STUDENTS IN AN ORGANIC CHEMISTRY COURSE

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ABSTRACT

The study of determinants of university students' performance has been an ongoing research in the last decade. Whether or not class attendance is a major factor has been debated over the years, but the empirical studies have been few and inconclusive. This study investigated the impact of classroom attendance on academic performance of university students in an Organic Chemistry course. It also looked into the moderating effect of gender on attendance and academic performance. Data was collected through expo-facto survey involving real time documentation of attendance for each student at each class lesson throughout a particular (3 months) semester. Data collected were analyzed using the Statistical Package for Social Sciences (SPSS) 17.0 to present the descriptive and inferential statistics. The results revealed a significant effect of attendance marks on academic scores at $p < 0.05$ ($t = 0.00$). However there was no significant effect of gender on academic scores ($t = 0.484$), $p < 0.005$ and also, no significant effect of gender on attendance ($t = 0.986$) at $p < 0.05$. Recommendations were made for policies and classroom practices that would improve class attendance of university students. [*African Journal of Chemical Education—AJCE* 7(1), January 2017]

INTRODUCTION

The issue of poor class attendance rate in higher institutions of learning has been and is still a major concern for educators and educational researchers all over the world [1-2]. This is because most educators basically believe that an above average attendance rate would enhance student academic performance in that particular course [3-5]. According to Crede, Roch and Kieszczynka there is skepticism on the part of students and researchers on the importance of class attendance as reflected in the high-class absenteeism rates [6] ranging from 18.5% [7] and 25% [8] to 59-70% [9].

Tertiary institutions in Nigeria today have ascribed great importance to class attendance with some institutions mandating above 70% attendance rate as criterion for writing semester examinations, while some make it a percentage of the continuous assessment. Others exhort lecturers to motivate students to attend lectures by all means. However, in this day of global education through technological advancement in E-learning, on-line tutorials and so on, the question is 'Does attending classes really have a significant impact on students' academic performance?'

Absenteeism is common across university classes. Some of the reasons cited in the literature are illness, tiredness, prioritizing other academic work, anticipation of low academic gain, lack of interest/motivation or boredom [10-14]. A major reason for student absenteeism in classes might be the availability of online material, access to PowerPoint presentations, and YouTube. Consequently, this raises the issue of whether missing class (physical absence from the classroom), has impacts on student learning as it used to do before the recent technological advances.

Some researchers posited that attending classes not only allow students to obtain information that is not contained in textbooks or lecture materials presented on-line but also allow students varied contact with materials(lectures, review of notes, demonstrations and so on) [6].

Arulampakam, Naylor and Smith stated that missing class has an adverse effect on performance only for more able students [15]. They further reported that there seems to be no effect of missing class for lower ability students. Hence, the research reports on the influence of class attendance on academic performance in higher institutions are not conclusive. According to Ogbogu performance is vital because the level of success that students achieve from the university has far reaching implications for their personal and professional lives [16]. It has also been reported to have impact on the career choice, personal income, level of success, as well as the degree of participation in community life [17].

This study therefore aims to provide an empirical evidence of effect of class attendance on performance of university students at a private university in Nigeria, and also find out if gender has any extraneous effect on both attendance and performance.

LITERATURE REVIEW

There have been varying policies and practices in higher institutions of learning today concerning attendance of students. This is because of the common assumption that undergraduate students benefit from attending lectures. However, until the early 1990s there was little evidence to establish whether attendance really has effect on students' academic performance.

Park and Kerr conducted a research on determinants of academic performance using "A Multinomial Logit Approach" and reported that the role of class attendance was statistically significant in explaining students' grades in those classes. Specifically, their findings demonstrated

that the lack of attendance was statistically significant in explaining why a student received a D rather than an A, a B or a C grade. The statistical tests employed revealed that regular class attendance was a significant determinant in minimizing a student's chance of receiving D or F,[18].

Following his report, Romer in his research reported a significant difference in the mean GPA of students with strong attendance over those with poorer attendance [3]. However, Hammen and others reported a weak but negative correlation ($r = -0.33$) between examination score in psychology and absenteeism in class [19]. Since then, there has been a growing body of evidence on the quantitative impact of attendance on performance of higher education students [9, 20, 21]. Most of these researchers reported positive effects of class attendance on performance and as led some authors to call for policies to improve on attendance of students or make it mandatory as a criterion for writing semester examinations.

Moreover, it is assumed that motivated and hardworking students are more likely to attend class and to score more highly in their courses. In a study conducted by Rodgers , using data on attendance in an introductory statistics module at an Australian university, he a strong positive association between attendance and performance. However, he further stated that attendance alone does not improve performance [20].

Stanca used a survey-based panel data set of students taking microeconomics at an Italian university and reported a significant positive causal effect of attendance on performance [22]. However, Martins and Walker reported that there was no significant effect of class attendance on performance for students in the Economics department at a university in UK [23].

Moreover, in a meta-analytical review of the relationship of class attendance with grades and student characteristics, Crede and others discovered that the highest performing students had either very good or very poor class attendance and those students in the lowest quintile of grades

were most likely to have average (rather than poor) attendance [6]. They also reported that benefits of attendance for grades appear to decrease once an average level of attendance has been attained. That is, the difference in grades between students with poor attendance and students with average attendance was larger than the difference between students with average attendance and students with very good attendance.

Jaykaran and others carried out in an institute where attendance is proposed to be made mandatory at a minimum of 75% attendance rate as criterion for students to sit for semester examinations. The students were divided into two groups; students who had at least 75% class attendance and those who had less than 75% class attendance. It was observed that there was statistically significant difference between the two groups for mean marks. Mean marks were higher in the group where attendance was 75% or more (unpaired t-test $p < 0.0067$). [24]

Also, Adegoke, Salako and Ayinde, carried out a study on the impact of attendance on students' academic performance at a polytechnic in Nigeria, they reported a weak positive correlation (correlation coeff. = 0.298) between scores and attendance of students. They also reported that a student can manage to score 36% even if he fails to attend any lectures and must have a minimum attendance of two out of ten to have a pass mark [25].

However, some researchers reported that mandatory attendance policies only has a small positive effect on performance and that it may not significantly enhance course grade [6, 26]. Very few of these researches were done on the shores of this country, and the ones done were mostly on polytechnic students [25].

Furthermore, gender is considered to be a contributing factor to academic performance in undergraduate and postgraduate [24]. Some studies have reported statistical significant difference

in the performance of male and female university students while others found no statistical difference in the performance of both male and female university students [24, 27].

THE PROBLEM, ITS SIGNIFICANCE AND RESEARCH QUESTIONS

The level of success that students achieve from university has far reaching implications on the Nation's development. Although a number of some personal and social factors have been found to influence the performance of students in the university, one factor that has been reoccurring in the last two decades is class attendance of students. In addition, past research reports have been inconclusive and presently there are varying policies on class attendance in the universities. This paper hopes to contribute to the body of evidence to resolve the ongoing debate regarding the impact of attendance on performance. It would also determine the effect of gender on attendance and performance of students in an organic chemistry class.

This study is significant in that it would give empirical evidence on the impact of attendance on Organic Chemistry examination scores of second year university students of College of Science and Technology Oduduwa University, Ile-Ife. Very few studies have been carried out on attendance and performance in Nigerian universities. Some were done on secondary school students [28, 29] and Polytechnic [25]. The research questions are:

1. What is the average of attendance of the year-two university science students in Organic Chemistry classes?
2. What is the average performance of the year-two university science students in Organic Chemistry?

The following null hypotheses were tested in this study at $p < 0.05$ level of significance.

H01: There is no significant effect / relationship of class attendance on examination scores in

Organic chemistry.

H02: There is no significant effect of gender on class attendance in organic chemistry.

H03: There is no significant effect of gender on examination scores in organic chemistry.

METHODOLOGY

This study adopted an ex-post-facto survey design using observed real time roll calling of names of students during each organic chemistry lecture. The sample consisted of 192 year-two students of college of science and technology, Oduduwa University Ile-ife, Osun state, Nigeria.

Two research instruments were used in collecting data for this study. They are;

- Attendance register consisted of columns and rolls for Names of students, Gender, Matriculation number, department and attendees signature.
- Organic chemistry II examination questions consisting of seven essay questions to answer five (total obtainable mark=100).

The attendance of each student was taken at each lecture period by students signing against their matriculation numbers and then, at the end of the lecture, the lecturer does the head count to correlate against the number of signatures. At the end of the semester, the lecturer calculates the total number of signatures per student/total number of lecture periods x 100. This is then recorded against their respective examination scores in Organic Chemistry II.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 through both descriptive and inferential statistics. The descriptive statistics are presented in tables. T-test was also conducted to determine significant effects.

RESULTS AND DISCUSSION

The result presented in Table 1 showed that the mean score of the second year science students of Oduduwa University in Organic Chemistry II is 51.39%, while the mean percentage attendance at the classes given throughout the semester is 76.88%.

Table 1: Mean and Standard deviation of Scores and Percentage Attendance of the Students

	N	Mean	Standard deviation	Standard Error Mean
Score	160	51.394	16.284	1.287
Attendance	160	76.875	11.625	0.919

Table 2: Levene's Test for Equality of Mean Score and Attendance

	Levene's test for equality of variance		t-test for equality of means			
	F	Sig.	t	df	Mean diff.	Std. Error
Equal variances assumed	22.475	.000	-16.109	318	-25.481	1.582
Equal variances not assumed			-16.109	287.687	-25.481	1.582

P < .05

The result presented in Table 2 showed that there is a significant effect of attendance on the examination scores of students in Organic Chemistry II. Hence, the null hypothesis Ho1 is rejected.

Moreover, Table 3 below established a significant relationship between class attendance and examination of second year science students of Oduduwa University in Organic Chemistry.

Table 3: Correlation Analysis between students' examination scores and attendance.

	Score	Attendance
Score		
Pearson correlation	1	.709**
Sig. (1-tailed)		.000
N	160	160
Attendance		
Pearson correlation	.709**	1
Sig. (1-tailed)	.000	
N	160	160

**Correlation is significant at the 0.01 level (1-tailed). There was significant correlation (r = 0.709) at probability level of 0.01.

Tables 4 and 5 below present the result of the t-test conducted on the data.

Table 4: Mean Score of the Respondents in Organic Chemistry II by Gender

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Male	62	52.532	17.094	2.171
	Female	98	50.674	15.797	1.595

Table 5: Analysis of Variance

	Levene's test for equality of variance		t-test for equality of means				
	F	Sig.	t	df	Sig. (2-tailed)	MD	Std. error
Score Equal variances assumed	.469	.494	.702	158	.484	1.859	2.647
Equal variances not assumed			.690	122.276	.492	1.859	2.694

P < .05

The results presented in Tables 4, 5 revealed that there is no significant effect of gender on examination scores in Organic Chemistry II. T-test analysis result between the female and male scores. There was no significant difference between the score of both sexes at $P = 0.05$ ($t = 0.484$), hence the null hypothesis H_0 is not rejected. There is no significant variance between the mean scores of male and female students.

Table 6: Mean attendance of male and female second year science students of Oduduwa University in Organic chemistry class

	Gender	N	Mean	Std. Deviation	Std. Mean Error
Attendance	Male	62	76.85	14.062	1.796
	Female	98	76.89	9.858	0.996

Table7: Analysis of variance in attendance of male and female second year university students in Organic Chemistry class

	Levene's test for equality of variance		t-test for equality of means				
	F	Sig.	t	df	Sig. (2-tailed)	MD	Std. error diff.
Attendance							
Equal variances assumed	1.298	.256	-.017	158	.986	-.033	1.892
Equal variances not assumed			-.016	98.820	.987	-.033	2.045
P< .05							

Table 7 revealed that there is no significant difference in the class attendance of male and female second year science students at $p < 0.05$ ($t = 0.986$). Hence, the null hypothesis H03 is not rejected.

DISCUSSIONS

The results of this study as presented in the tables shown, revealed that class attendance has a significant positive correlation with examination scores. It also established a significant effect of the attendance of students on their performance in Organic Chemistry examination. These findings corroborate the reports of Crede and others that class attendance correlates strongly with college grades [6], also Andrietti and others also reported that class attendance has a significant effect on performance of university Spanish students [30]. Furthermore, the result of this study revealed that there was no significant difference in the attendance and scores of male and female second year science students of Oduduwa University. This is similar to the findings of some researchers like Niraula and others that there was no statistically significant difference between male and female academic performance of medical students ($p = 0.29$). Furthermore, it corroborates the reports of Cortright, Lugan, Cox & Dicarolo and that of Nyamapfene that there is no gender bias

in class attendance and academic performance of Psychology and Engineering students respectively [31, 32].

CONCLUSIONS AND RECOMMENDATIONS

The study carried out an investigation of the relationship and effect of class attendance and examination score of second year science students of Oduduwa University in Organic Chemistry course during a particular semester. The students were scored on attendance at each lecture period. The score of each student was then recorded against the percentage attendance throughout the semester period. The results of the statistical analysis of the data showed that class attendance correlated strongly with and had significant effect on examination score in Organic Chemistry II. In addition, that gender has no significant effect on class attendance and examination scores of students in Organic Chemistry II.

Based on the findings of this study, the following recommendations are made:

1. Lecturers should employ teaching strategies that would enhance the attendance rate of students in their classes.
2. Relevant policies should be put in place to ensure the attendance of students in classes.
3. Classes should be made conducive for learning.
4. Lecture rooms should be well ventilated and spacious enough to accommodate conveniently, the total number of students per lecture.

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