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Statistical Analysis Of Students' Sways On Mobile Phone Usage On Their Academic Performance: A Case Study Of Ogun State Institute Of Technology, Igbesa, Nigeria

Fatoki, O.

Adeleye, N. F.

Amosu, O. M.

Department of Statistics, Ogun State Institute of Technology, Igbesa

Abstract: ***This research article attempts to examine the impact of mobile phone usage on students' academic performance. Two hundred and thirty (230) questionnaires were administered to students in Ogun State Institute of Technology, Igbesa, who are mobile phones users while two hundred (200) questionnaires were returned.***

Two hypotheses were formulated and each of the survey responses was entered and analyzed using frequency analysis, Chi-square test and Analysis of Variance. Findings revealed that the null hypothesis was rejected in hypothesis one which states that "there is a significant relationship between mobile phone users and increase in students' information research skills". In the hypothesis two the null hypothesis was also rejected which shows that "Mobile phone usage has positive effects on students' academic performance".

Keywords: Mobile phone, students, Chi-square test, analysis of variance and academic performance.

I. INTRODUCTION

The impact of mobile phone usage on students' academic performance cannot be under-estimated lecturers, researchers, individual and management of the institute as a whole.

Overtime, before the discovery of mobile phone technology, students were making use of the traditional library to search for academic information and to carry out their research work which posed a lot of difficulties to students because of accessibility.

However, with the introduction of network facilities, students who are mobile phone users can now have access to unlimited materials online to carry out their research work, assignment and search for academic information at their own will.

Studies have proven that excessive use of social Media such as Whatsapp, Facebook and Instagram etc. has negative effects on the academic performance of students. In this context the study focused on impact of mobile phone usage on students' academic performance.

A. OBJECTIVES OF THE STUDY

- ✓ To determine whether mobile phone usage increases students' information research skills.
- ✓ To measure the effects of mobile phone usage on students' academic performance.

II. LITERATURE REVIEW

Aoki and Downes (2004) focused on the behavioural and psychological aspects of mobile phone usage among college students. They tried to find the reasons behind why a technology is adopted in a particular way.

Castells, Mireia, Qiu and Sey (2004) extensively looked into the rise of mobile phone norms among youth in a cross-

cultural perspective. The stated hypothesis was that "there is a youth culture that finds in mobile communication an adequate form of expression and reinforcement"

Lenhart, Smith and Zickuhr, (2011) recent Pew Internet and American Life Survey say that 30 percent use their cell phones to follow local news and 42 percent use their phones for weather updates. These devices are giving highly mobile citizens the ability to access information and communication. Maguth (2013) further contends that smart phones hold many capabilities as computers. These functions include using text messaging to search and translate, sending out free notices to students and parents, and making PowerPoint presentations interactive.

III. MATERIALS AND METHODS

The study focused on impacts of mobile phone usage on students' academic performance in Ogun State Institute of Technology Igbesa, Ogun State. The institution was stratified into five faculties. That is, School of Engineering Technology, Pure and Applied Science, Management Studies, Environmental Studies and School of General Studies and Communications.

Simple random sampling was used to select the representative sample in this study. Two hundred and thirty (230) questionnaires were administered while Two hundred questionnaires were returned (200) and analyzed using frequency analysis, Chi-square and analysis of variance to test the hypothesis.

A. CHI-SQUARE DISTRIBUTION

This test was used to compare the observed frequencies with those we might expect from a given theoretical explanation of the phenomenon under investigation. That is, to determine how well the theoretical distributions (Normal, Binomial, Poisson etc.) fit empirical distributions. A measure of this discrepancy is given by the χ^2 (chi-square) Statistic defined as:

$$\chi^2 = \sum_{i=1}^{n} \frac{(0_i - e_i)^2}{e_i}$$

B. ANALYSIS OF VARIANCE (ANOVA)

The technique, known as analysis of variance, employs test based on variance-ratios to determine whether or not significant differences do exist among the means of several group of observations, where each group follows a normal distribution. Analysis of variance is particularly useful when the basic differences between the groups cannot be stated quantitatively. As the number of independent variables increases, the calculations become much more complex and are best carried out on a computer. The term independent variable is what is also referred to as factor or treatment.

a. ONE-WAY ANALYSIS OF VARIANCE

One-way analysis of variance is used when we wish to test the equality of k population means. The procedure is based on the assumption that each of the k groups of observations is a random sample from a normal distribution and that the population variance is constant among the groups. The statistical model for one-way classification of analysis of variance is $Y_{ij} = \mu + \tau_i + e_{ij}$

$$where,\ y_{ij=ij^{th}}\ observation,$$
$$\mu = overall\ mean, \quad \tau = i^{th}\ treatment\ effect$$
$$e_{ij} = random\ error$$

ANALYSIS OF VARIANCE TABLE

Source of Variation	Degree of Freedom	Sum of Square	Mean Square	F-ratio
Treatment (*SSTR*)	$k-1$	$SSTR$	$MSSTR = \frac{SSTR}{k-1}$	$\frac{MSSTR}{MSSE}$
Error	$N-k$	SSE	$MSSE = \frac{SSE}{N-k}$	
Total	$N-1$	SST		

IV. PRESENTATION OF RESULTS AND DISCUSSION

A. BIO-DATA OF THE RESPONDENTS

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	111	55.5	55.5	55.5
Female	89	44.5	44.5	100.0
Total	200	100.0	100.0	

Table 1: Sex of Respondents

Table 1 above shows the distribution of respondents by gender, 111 (55.5%) of the respondents who use mobile phone are male while 89 (44.5%) were female. The results indicated that there were more male respondents than female.

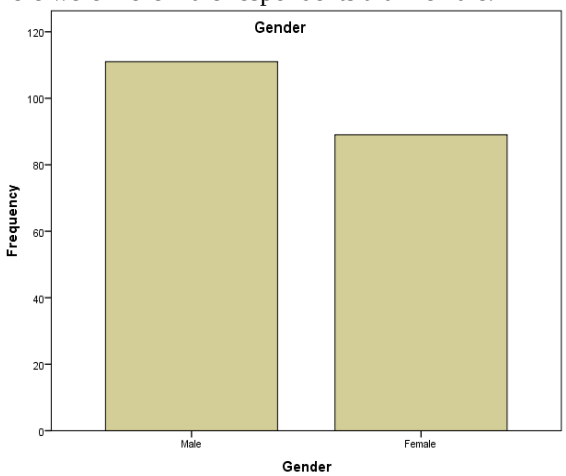

Figure 1: Bar chart showing gender of respondent

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	Frequency	Percent	Valid Percent	Cumulative Percent
18 – 22	157	78.5	78.5	78.5
23 – 27	37	18.5	18.5	97.0
28 – 32	6	3.0	3.0	100.0
Total	200	100.0	100.0	

Table 2: Age of the respondents

Table 2 above, shows the distribution of respondents by their age. 157(78.50%) of respondents who use mobile phone are within the age bracket of 18 - 22years, while 37(18.50%) of the respondents are within the age range of 23 - 27years and only 6(3.0%) are within the age range of 28 - 32years, Hence, there were more number of students who use mobile phone within the age of 18-22years than 23-27years and 28-32years

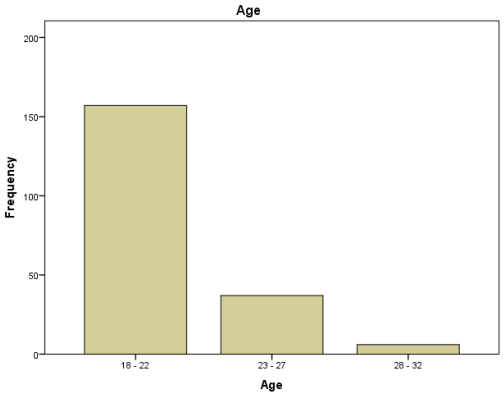

Figure 2: Bar chart showing age distribution

Mobile phone is also helpful for students in the exchange of some useful information with their course mates about their studies; students use this fascinating magic device also in various ways. Some of the studies clearly indicated that this technology has increased the academic performance. In this context the study shows that:

Table 4: Effects of Mobile Phone Usage on Students

S/N	Variables	SA	A	U	D	SD	TOTAL
1.	Using of mobile phone can lead to increase in student academic reading skills	114.0	73.0	3.0	5.0	5.0	200
		57.0	36.50	1.50	2.50	2.50	100%
2.	Using of mobile phone can lead to increase in student academic writing skills	63.0	61.0	23.0	40.0	13.0	200
		31.50	30.50	11.50	20.0	6.50	100%
3.	Using of mobile phone can lead to increase in student GPA/CGPA	44.0	74.0	24.0	46.0	12.0	200
		22.0	37.0	12.0	23.0	6.0	100%
4.	Using of mobile phone always distract me during lectures	49.0	68.0	12.0	51.0	20.0	200
		24.50	34.0	6.0	25.50	10.0	100%
5.	Using of mobile phone can lead to increase in social life of a student	96.0	88.0	7.0	6.0	3.0	200
		48.0	44.0	3.50	3.0	1.50	100%
6.	Using of mobile phone most time distract me during lectures	44.0	73.0	6.0	53.0	24.0	200
		22.0	36.0	3.0	26.0	12.0	100%
7.	Using of mobile phone can lead to increase in information research skills	154.0	42.0	2.0	1.0	1.0	200
		77.0	21.0	1.0	0.50	0.50	100%
8.	Using of mobile phone can lead to the decrease in GPA/CGPA	27.0	47.0	36.0	70.0	20.0	200
		13.50	23.50	18.0	35.0	10.0	100%
9.	Receiving call or messages before class will have an impact on your ability to concentrate during lecture period	40.0	67.0	28.0	43.0	22.0	200
		20.0	33.50	14.0	21.50	11.0	100%

Source: Author' Computation, 2018

Table 3: Increase in the usage of mobile phone among students (implications)

From table 3 above, majority of the respondents (57.0%) strongly agreed that mobile phone usage can lead to increase in student academic reading skills while 30.5% also agreed that it can increase student academic reading skills.

31.5% of the respondents strongly agreed that it can lead to increase in students' academic writing skill while 30.5% supported that it increase students' academic writing skills.

37.0% of the respondents agreed that it has a positive effects to increased students GPA/CGPA, 22.0% also strongly agreed while 23.0% of the respondent disagreed that it has not been improving their GPA/CGPA

34.0% of the respondents agreed that the use of mobile phone always distract them during lectures, 24.5% strongly agreed that it distract during lectures and 25.5% disagreed that it does not distract them during lectures periods.

Majority of the respondents (48.0%) strongly agreed that it has increased their social life status while 44.0% agreed that the use of mobile phones has increased the social life of students. 36.5% of the respondents agreed that the use of mobile phones most times distracted during lectures, 22.0% strongly agreed that it distracted during lectures and 26.5% of the respondents disagreed that the use of mobile phones did not distract during lecture.

77.0% 0f the respondents strongly agreed that the use of mobile phones can lead to information research skills and 21.0% agreed that it can lead to increase in their information research skills.

35.0% of the respondents disagreed that the use of mobile phones can lead to decrease in their GPA/CGPA, 23.5% agreed and 13.5% of the respondents are strongly in support of the statement.

33.5% of the respondents agreed that receiving calls or text messages before class will have an impact on students concentrating during the lecture period, 20.0% are strongly agreed and 21.5% are disagreed.

S/N	Variables	YES	NO	TOTAL
1.	Do you think that mobile phones are useful to your academic studies?	198.0	2.0	200
		99.0	1.0	100%

2.	Have you used a mobile phone during lecture period before?	107.0	93	200
		53.50	46.50	100%
3.	Have you ever used a mobile phone during lecture period to enhance or improve your understanding about a particular topic before?	162.0	38.0	200
		81.0	19.0	100%
4.	Do you think that mobile phone usage has any positive effects on your studies?	167.0	33.0	200
		83.50	16.50	100%
5.	Have you ever been distracted by your mobile phone during lecture period before?	90.0	110.0	200
		45.0	55.0	100%
6.	Do you think that using of mobile phone can contribute negatively to your studies?	80.0	120.0	200
		40.0	60.0	100%
7.	Using of mobile phone is responsible for my low CGPA	41.0	159.0	200
		20.50	79.50	100%
8.	Using of mobile phone is responsible for my high CGPA	114.0	86.0	200
		57.0	43.0	100%

Source: Author' Computation, 2018

Table 4: Effects of Mobile Phone Usage on Students

From table 4 above, almost 99.5% of the respondents supported yes that mobile phone are useful for academic studies while less than 1.0% did not..

53.50% of the respondents indicated yes that they have used mobile phones during lecture period before and 46.5% said no

Majority of the respondents (81.0%) revealed that they have used mobile phone during lecture period to enhance or improve their understanding about a particular topic ever before while 19.0% of the respondents declined that it has never improve their understanding about a particular topic.

83.5% of the respondents indicated that mobile phone usage has positive effects on students' academic performances, while 16.5% revealed that it has negative effect on their studies.

55.0% of respondents indicated that they have not been distracted by use of mobile phone during lecture period, while 45.0% supported that they have been distracted by use of mobile phone during lecture period.

60.0% of respondents revealed that the use of mobile phone cannot contribute negatively to student's studies while 40.0% indicated that the use of mobile phone can contribute negatively to their studies.

Majority of the respondents (79.5%) claimed that the use of mobile phone is not responsible for their low CGPA and 20.5% say yes that use of mobile phone is responsible for their low CGPA.

Research	Submitting Assignments	E-learning	Group Discussion
119	27	39	15
59.50%	13.50%	19.50%	7.50%

Tables 5: What are some of the usefulness of mobile phone to students?

59.5% of respondents revealed that they use mobile phone for research, 19.5% for E-Learning, 13.5% for submitting assignment while less than 8% says they use it for group discussion.

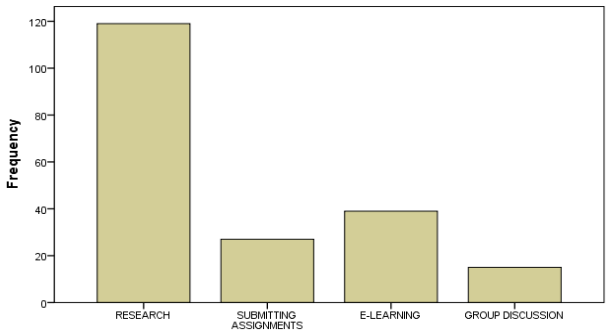

Figure 3: Bar chart showing usefulness of mobile phone to students

Receiving Calls	Text Messages	Social Media Site Visitation	Watching Pictures and Videos	Others
88	25	51	26	10
44.0%	12.50%	25.50%	13.0%	5.0%

Tables 6: What form of distraction does the phones pose during lecture period?

44.0% of the respondents shows that receiving calls distracts class activities during the lecture period, 25.5% revealed that social media site visitation by students is a distraction to students' academic performance during lecture period, while 13.0% of the respondents indicated watching pictures and videos distracts students during lecture period and 12.5% clearly stated that reading or sending a text messages during lecture periods distracts students during lecture period.

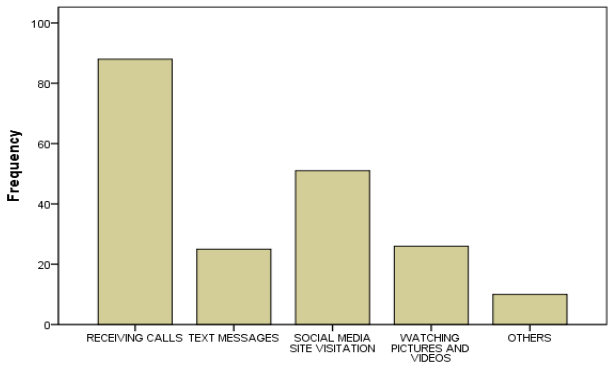

Figure 4: Bar chart showing forms of distraction phones pose during lecture period

B. HYPOTHESIS TESTING

In this study, two hypotheses were formulated and were analyzed using Statistical Package for Social Sciences (SPSS)

a. HYPOTHESIS ONE

H_0 : Mobile phone usage and increase in student's information research skill are

Independent

H_1 : Mobile phone usage and increase in student's information research skills are related.

Chi-Square was used to test the hypothesis

$$\chi^2 = \sum_{i=1}^{n} \frac{(0_i - e_i)^2}{e_i}$$

At 5% level of significance.

		What are some of the usefulness of mobile phone to students				
		Research	Submitting Assignment	E-learning	Group Discussion	Total
Using of mobile phone can lead to increase in information research skills	STRONGLY AGREE	93	21	31	9	154
	AGREE	25	6	7	4	42
	UNDECIDED	1	0	0	1	2
	DISAGREE	0	0	1	0	1
		0	0	0	1	1
Total		119	27	39	15	200

Table 7: Cross tabulation between the usefulness of mobile phone usage and the increase in students' information research skill

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	23.007[a]	12	.028
Likelihood Ratio	12.972	12	.371
Linear-by-Linear Association	5.220	1	.022
N of Valid Cases	200		

Table 8: Chi-Square Test

DECISION

The probability value (PV) is less than 5% level of significance that is 0.028 < 0.05, it is statistically significance. This implies that we do not accept H_0 which states "that mobile phone usage and increase in student's information research skill are independent" and accept H_1 and conclude that mobile phones usage and increase in student information research skills are related.

b. HYPOTHESIS TWO

H_0 : The use of mobile phones has no positive effects on students' academic performance.

H_1 : The use of mobile phones has positive effects on students' academic performance.

Source Of Variance	Sum Of Square	Df	Mean Square	F	Sig
Treatment	0.935	2	0.467	3.4	0.033
Error	26.620	197	0.135	59	
Total	27.555	199			

Table 9: Analysis of variance (ANOVA) Table

DECISION

The Probability Value (PV) is less than 5% level of significance that is, 0.033 < 0.05. It shows that it is statistically significant. This means we do not accept H_0 that says that "the use of mobile phones has no positive effects on students' academic performance" and accept H_1 and conclude that mobile phone has positive effects in improving students academic performance.

C. FINDINGS

The null hypothesis (H_0) was rejected in hypothesis One which clearly shows that there is a significant relationship between mobile phone usage and increase in students' information research skulls.

The null hypothesis (H_0) was also rejected in hypothesis two which clearly shows that mobile phone usage has positive effects on students' academic performance.

V. CONCLUSION

Mobile phone is one of the most important technology discoveries of this age. It has its positive effects as well as negative impacts on our society. The study revealed that students of Ogun State Institute of Technology Igbesa, Ogun state (OGITECH) are aware of the new and current trends happening on social media sites, also watching of online videos and so on with easy accessibility.

In hypothesis one, finding revealed that there is a significant relationship between mobile phone usage and increase in students' information research skills, while hypothesis two shows that mobile phone usage has positive effects on students' academic performance.

However, mobile phone can also influence students to a great extent through the adequate and proper surfing of social media sites and negatively too if the attention is focused mostly on chatting, listening or downloading music and watching online videos while their academic activities are neglected and left to suffer.

A. RECOMMENDATIONS

- ✓ Workshop/Training should be organized by the management through centre for Information Communication Technology (ICT) on the usefulness of mobile phone and other network facilities in order to improve their academic performance.
- ✓ Management should encourage students to pay more attention to academic information via their mobile phone than social media in order to improve their academic performance.
- ✓ Finally, it should be made compulsory for all newly admitted students to purchase tablet at a subsidized rate by the management in order to encourage student on the

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use of mobile phone and educate them on how it can improve their academic performances.

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