Science Park Journals

Vol. 1(1), pp. 001-010, January 2020
ISSN 2315-5790
DOI: 10.14412/IRJAT2020.010

Available online at
http://www.scienceparkjournals.org/IRJAT

International Research Journal of Accounting and Taxation

Full Length Research Paper

EVALUATION OF PERFORMANCE OF STUDENTS IN CORE-DEPARTMENTAL COURSES IN THE DEPARTMENT OF BUSINESS ADMINISTRATION AND MANAGEMENT.

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ABSTRACT: The performance of students in core –departmental courses was evaluated to ascertain whether performance of students in the selected courses is the same in all e core courses offered by the students. Data used for the study were secondary obtained from the departmental records for the three groups labelled A, B and C and merged together. Friedman's test was employed and it showed that the performance of students in the selected courses is the same for each course. The data was further displayed on the contingency table. The Chi-square test carried out revealed that the grades are equally distributed and students' performance depends on the course. Validation of the results was carried out using SPSS software.

KEYWORDS: Performance, courses, Chi-square, contingency table, Friedman.

INTRODUCTION

Educational research refers to the systematic collection and analysis of data related to the field of Education. Research may involve a variety of methods. It may involve various aspects of education including student learning, teacher training and classroom dynamics. Barnett (1960) had long stated that research and development can be equated with economic transformation or that increase in economic growth necessitates an increase in government. He further stated that there exists a correlation between research and development and economic growth. Ozturk (2001) opined that there can be no reasonable research without proper education. Education is a pivot for development. It enhances people's

productivity and creativity and promotes entrepreneurship and technological advances. He further added that education plays a very important role in securing economic and social progress and improving income distribution. A good education broadens our horizons and gives us good chances in life. Knowledge enables people to grow and influence their situations. According to David (2006): students' performance refers to the outcome of education and extent to which the student has achieved their goals. Performance is the ability to study and remember facts and being able to communicate one's knowledge verbally or written.

Technology on the other hand is transforming the worlds of teaching and learning and research by delivering personalized, digital experiences, students' facility and researcher expectation. Higher education and research institutions around the world enhance teaching and learning with innovative cloud solutions that improve students' retention and success. Kingdom &Maekae (2013) outlined that a nation develops in relation to its achievement in education. This is because education is the life of a nation, it is a live wire of its industries and also the foundation of moral regeneration and revival of its people. It is also the force and bulwark of any nation's defence and has been observed that no nation rises above the level of its education. Thus, education is an important sector in any country. It is a major investment in human capital development. It plays a critical role in long-term productivity and growth at both micro and macro levels. The consequence of declining quality of education at all levels has far-reaching negative impact on a nation's moral, civic, cultural and economic sustainability. However, Hijazi and Nagvi (2006), Ichado (1998), Ajila and Olutola (2007), stated that academic performance can be influenced by some factors such as Physical factors like health, physical development, nutrition visual and physical defects, and glandular abnormality may affect performance. Emotional and social factor, personal factor such as stress and emotions and social factors as cooperation and rivalry are directly related to a complex psychology of motivation. Environmental factor: physical conditions needed for learning is under environmental factor one of the factors that affect the efficiency of learning is the condition in which learning takes place. Research is about contributing to a growing pool of knowledge and information. Research is required not just for students and academics but for all professionals. Knowledge basically pertains to facts based on objective insights and/or study of findings processed by the human brain. It can be acquired through various means like through reading books, online articles and listening to experts.

Research is a tool for building knowledge and for facilitating learning, a means to understand various issues and increase public awareness, an aid to business success, a way to prove lies and support truths, means to find, gauge and seize opportunities, a seed to love reading, writing, analyzing and sharing valuable information and nourishment and exercise for the mind. In view of the importance of education in our economy, performance of students should be closely monitored. Academic performance of students is the extent to which a student, teacher, or institution has achieved their short or long term goals. It is commonly measured through examinations or continuous assessments.

Thus, this paper is interested in evaluating the performance of students in five (5) selected courses to verify if performance is the same in all courses and if dependent on course.

DATA COLLECTION: Data used for the study were collected from the department of Business Administration. It is a secondary data. Performances of students in the three groups were merged in the selected courses were

DATA ANALYSES TECHNIQUES

Friedman's test as well as chi-square test of independence would be employed.

The Friedman's test is a non-parametric statistical test used to detect differences in treatments across multiple test attempts. The procedure involves ranking each row (or blocks) together, then consider the values of ranks by columns.

The test statistic is given as

$M = \frac{12}{nk(k+1)} \sum_{i=1}^{k} R_i^2 - 3n(k+1)$

Statement of Hypothesis

H_O: Performance of students in the courses are the same

H_1: Performance of students in at least one course is different from others.

For large sample sizes, the sampling distribution is approximately as the χ^2distribution with v = k – 1 degrees of freedom.

The critical regions are of the form:

1 Reject H_0 if $M > M_{\alpha,n.k}$ when using the Friedman's Test table with v = k – 1 degree of freedom.

2 Reject H_0 if $M > \chi_\alpha^2$ when using the χ^2 approximation with v = k – 1 degree of freedom.

Table 1a: Original Data Grades

Course(s)	A	AB	B	BC	C	CD	D	E	F
BAM 311	9	12	7	58	15	26	18	58	23
BAM 312	12	16	21	30	44	74	8	11	12
BAM 313	37	38	35	31	20	26	5	17	12
BAM 314	2	16	38	67	27	33	19	15	12
BAM 315	80	48	36	31	14	4	1	1	2

Sources: 2017/2018 First semester Performance.

Table 1.2 Grades Ranks

Course(s)	A	AB	B	BC	C	CD	D	E	F	Total
BAM 311	2	1	1	4	2	2.5	4	5	5	26.5
BAM 312	3	2.5	2	1	5	5	3	2	3	26.5
BAM 313	4	4	3	2.5	3	2.5	2	4	3	28
BAM 314	1	2.5	5	5	4	4	5	3	3	32.5
BAM 315	5	5	4	2.5	1	1	1	1	1	21.5

Using the formular

M = $\frac{12}{nk(k+1)}\sum_{i=1}^{k} R_i^2$ – 3n(k+1)

n = 9, k = 5

M = $\frac{12}{9\times5(5+1)}[26.5^2 + 26.5^2 + 28.0^2 + 32.5^2 + 21.5^2]$ - 3× $9(5+1)$

= $\frac{12}{270}$(3707) – 126 = 164.755556 – 162

= 2.7556

Critical Value: $M_{\alpha,n.k}$ = $M_{0.05,9.5}$ = 9.244 and $M_{0.01,9.5}$ = 12.44. Since the calculated value is less than the tabulated value, i.e, 2.7556 < 9.244and 2.7556 < 12.44, H_0 is accepted.

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Conclusion: There is no significant difference in the performance of students in the courses at 5% and 1% significance levels respectively. Hence, the courses are equally difficult or equally simple depending on the students' preparedness.

In this case, since the sample size is large, we shall use the Chi-square approximation to Friedman's test. SPSS software yields the result below:

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
COURSE OF STUDIES * GRADES	1121	100.0%	0	0.0%	1121	100.0%

GRADES Crosstabulation

Count

		GRADES									
COURSE OF STUDIES		A	AB	B	BC	C	CD	D	E	F	Total
COURSE OF STUDIES	BAM 311	9	12	7	58	15	26	18	58	23	226
	BAM 312	12	16	21	30	44	74	8	11	12	228
	BAM 313	37	38	35	31	20	26	5	17	12	221
	BAM 314	2	16	38	67	27	33	19	15	12	229
	BAM 315	80	48	36	31	14	4	1	1	2	217
Total		140	130	137	217	120	163	51	102	61	1121

From the SPSS software print-out table above, M $<\chi_{\alpha}^{2}$, that is, M ≅ 27.22 < 46.19 or 27.22< 53.49, H_1 is rejected and H_0 accepted.

Chi-Square Test

The chi-squared (χ^2) distribution is a theoretical or mathematical distribution which has wide applicability in statistical work. Chi-squared test concerns frequencies and address the question of whether or not those frequencies are what we would expect to fit in a population. A chi-squared (χ^2) test is a measure of discrepancy between the actual and expected frequencies. The larger the values of χ^2, the greater the discrepancy between the actual and expected frequencies. The actual and expected frequencies are the same if χ^2 = 0. In other words, no discrepancy between the frequencies. In this section, a chi-squared test will be used to check if the performance of student is independent of the department courses.

Hypothesis.

H_O: Performance of students is independent of course(s).

H_1: Performance of students is dependent of course(s)

Let a r x c contingency table be occupied by their observed frequencies. Corresponding to each observed frequency in a row (r) by column (c) contingency table, there is an expected frequency computed subject to some hypothesis according to rules of probability.

The test statistic is given by

$$\chi^2_{cal} = \sum \frac{(O_{ij}-E_{ij})^2}{E_{ij}}$$

Where O_{ij} are observed frequencies at ith row and jth column.

$E_{ij}$are expected frequencies at ith row and jth column and

$$E_{ij} = \frac{Row\ total \times column\ total}{Grand\ total}$$

The critical region is

Reject H_O if $\chi^2_{cal} > \chi^2_{\alpha,(r-1)(c-1)}$ otherwise accept H_1

An outlay of the contingency table is given below.

Table 1.4 observed and expected values Grades

Course(s)	**A**	**AB**	**B**	**BC**	**C**	**CD**	**D**	**E**	**F**	**Total**
BAM 311	9 (28.2)	12 (26.2)	7 (27.6)	58 (43.7)	15 (24.2)	26 (32.9)	18 (10.3)	58 (20.6)	23 (12.3)	226
BAM 312	12 (28.5)	16 (26.4)	21 (27.9)	30 (44.1)	44 (24.4)	74 (33.2)	8 (10.4)	11 (20.7)	12 (12.4)	228
BAM 313	37 (27.6)	38 (25.6)	35 (27.0)	31 (42.8)	20 (23.7)	26 (32.1)	5 (10.1)	17 (20.1)	12 (12.0)	221
BAM 314	2 (28.6)	16 (26.6)	38 (28.0)	67 (44.3)	27 (24.5)	33 (33.3)	19 (10.4)	15 (20.8)	12 (12.0)	229
BAM 315	80 (27.1)	48 (25.2)	36 (26.5)	31 (42.0)	14 (23.2)	4 (31.6)	1 (9.9)	1 (19.7)	2 (11.8)	217
Total	140	130	137	217	120	163	51	102	61	1121

The expected Value is given by $E_{ij} = \frac{\text{Row Total x Column Total}}{\text{Grand Total}}$

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The expected values are enclosed in brackets

Observed frequency O_{ij}	Expected frequency E_{ij}	O_{ij} - E_{ij}	$\frac{(O_{ij} - E_{ij})^2}{E}$
9	28.2	-19.2	13.072
12	26.2	-14.2	7.696
7	27.6	-20.6	15.375
58	43.7	14.3	4.679
15	24.2	-9.2	3.498
26	32.9	-6.9	1.447
18	10.3	7.7	5.756
58	20.6	37.4	67.901
23	12.3	10.7	9.308
12	26.4	-16.5	9.553
16	27.9	-10.4	4.097
21	27.9	-6.9	1.706
30	44.1	-14.1	4.508
44	24.4	19.6	15.744
74	33.2	40.8	50.130
8	10.4	-2.4	0.554
11	20.7	-9.7	4.545
12	12.4	-0.4	0.012
37	27.6	9.4	3.201
38	25.6	12.4	6.006
35	27.0	8	2.370
31	42.8	-11.8	3.253
20	23.7	-3.7	0.578
26	32.1	-6.1	1.159
5	10.1	-5.1	2.575
17	20.1	-3.1	0.478
12	12.0	0	0
2	28.6	-26.6	24.730
16	26.6	-10.6	4.224
38	28.0	10	3.571
67	44.3	22.7	11.632
27	24.5	2.5	0.255
33	33.3	-0.3	0.003
19	10.4	8.6	7.112
15	20.8	-5.8	1.617
12	12.5	-0.5	0.02
30	27.1	52.9	10.262
48	25.2	22.8	20.629
36	26.5	9.5	3.406
31	42.0	-11	2.881
14	23.2	-9.2	3.648
4	31.6	-27.6	24.106
1	9.9	-8.9	8.001
1	19.7	-18.7	17.751
2	11.8	-9.8	8.139
Total			**484.604**

COURSE OF STUDIES * GRADES Crosstabulation

			GRADES									
			A	AB	B	BC	C	CD	D	E	F	Total
COURSE OF STUDIES	BAM 311	Count	$9_{a, b}$	$12_{a, b, c}$	7_{b}	58_{d}	$15_{a, c}$	26_{c}	18_{d}	58_{e}	23_{d}	226
		Expected Count	28.2	26.2	27.6	43.7	24.2	32.9	10.3	20.6	12.3	226.0
		% within COURSE OF STUDIES	4.0%	5.3%	3.1%	25.7%	6.6%	11.5%	8.0%	25.7%	10.2%	100.0%
		% within GRADES	6.4%	9.2%	5.1%	26.7%	12.5%	16.0%	35.3%	56.9%	37.7%	20.2%
		% of Total	0.8%	1.1%	0.6%	5.2%	1.3%	2.3%	1.6%	5.2%	2.1%	20.2%
	BAM 312	Count	12_{a}	$16_{a, b}$	$21_{a, b}$	$30_{a, b}$	44_{c}	74_{c}	$8_{a, b}$	$11_{a, b}$	12_{b}	228
		Expected Count	28.5	26.4	27.9	44.1	24.4	33.2	10.4	20.7	12.4	228.0
		% within COURSE OF STUDIES	5.3%	7.0%	9.2%	13.2%	19.3%	32.5%	3.5%	4.8%	5.3%	100.0%
		% within GRADES	8.6%	12.3%	15.3%	13.8%	36.7%	45.4%	15.7%	10.8%	19.7%	20.3%
		% of Total	1.1%	1.4%	1.9%	2.7%	3.9%	6.6%	0.7%	1.0%	1.1%	20.3%
	BAM 313	Count	$37_{a, b}$	38_{b}	$35_{a, b}$	31_{c}	$20_{a, c}$	26_{c}	5_{c}	$17_{a, c}$	$12_{a, b, c}$	221
		Expected Count	27.6	25.6	27.0	42.8	23.7	32.1	10.1	20.1	12.0	221.0
		% within COURSE OF STUDIES	16.7%	17.2%	15.8%	14.0%	9.0%	11.8%	2.3%	7.7%	5.4%	100.0%
		% within GRADES	26.4%	29.2%	25.5%	14.3%	16.7%	16.0%	9.8%	16.7%	19.7%	19.7%
		% of Total	3.3%	3.4%	3.1%	2.8%	1.8%	2.3%	0.4%	1.5%	1.1%	19.7%
	BAM 314	Count	2_{a}	16_{b}	$38_{c, d, e, f, g, h, i, j}$	$67_{h, i, j}$	$27_{f, g, j, k}$	$33_{b, e, g, k}$	$19_{d, i}$	$15_{b, k}$	$12_{b, c, e, f, g, h, j, k}$	229
		Expected Count	28.6	26.6	28.0	44.3	24.5	33.3	10.4	20.8	12.5	229.0
		% within COURSE OF STUDIES	0.9%	7.0%	16.6%	29.3%	11.8%	14.4%	8.3%	6.6%	5.2%	100.0%
		% within GRADES	1.4%	12.3%	27.7%	30.9%	22.5%	20.2%	37.3%	14.7%	19.7%	20.4%
		% of Total	0.2%	1.4%	3.4%	6.0%	2.4%	2.9%	1.7%	1.3%	1.1%	20.4%
	BAM 315	Count	80_{a}	48_{b}	36_{b}	31_{c}	$14_{c, d}$	4_{e}	1_{e}	1_{e}	$2_{d, e}$	217
		Expected Count	27.1	25.2	26.5	42.0	23.2	31.6	9.9	19.7	11.8	217.0
		% within COURSE OF STUDIES	36.9%	22.1%	16.6%	14.3%	6.5%	1.8%	0.5%	0.5%	0.9%	100.0%
		% within GRADES	57.1%	36.9%	26.3%	14.3%	11.7%	2.5%	2.0%	1.0%	3.3%	19.4%
		% of Total	7.1%	4.3%	3.2%	2.8%	1.2%	0.4%	0.1%	0.1%	0.2%	19.4%
Total		Count	140	130	137	217	120	163	51	102	61	1121
		Expected Count	140.0	130.0	137.0	217.0	120.0	163.0	51.0	102.0	61.0	1121.0
		% within COURSE OF STUDIES	12.5%	11.6%	12.2%	19.4%	10.7%	14.5%	4.5%	9.1%	5.4%	100.0%
		% within GRADES	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	12.5%	11.6%	12.2%	19.4%	10.7%	14.5%	4.5%	9.1%	5.4%	100.0%

Each subscript letter denotes a subset of GRADES categories whose column proportions do not differ significantly from each other at the .05 level.

13.072 + 7.696

H_1:

From the results of the analysis, the following interpretations are made:

$\chi^2_{\alpha,(r-1)(c-1)} = \chi^2_{0.05,(32)} = 46.19$

$\chi^2_{0.01,32} = \mathbf{53.49}$

Since $\chi^2_{(cal)} = 484.604 > 46.19$ or $484.604 > 53.49$, H_0 is rejected and H_1 accepted

Conclusion: Performance of students depends on the course(s)

Validation of this test is by use of software. The result is given below:

Chi-Square Tests Using SPSS Software

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	484.604[a]	32	.000
Likelihood Ratio	474.568	32	.000
Linear-by-Linear Association	189.629	1	.000
N of Valid Cases	1121		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.87.

From the table, the chi-square value is the same as the value initially obtained. Hence the same conclusion.

Di**scussion**

The Friedman's test revealed that there is no significant difference in the performance of students in the selected courses. This implies that the courses are equally difficult or equally simple as the case may be. The chi-square test of independence revealed that performance of students depends on the course.

Summary

There was no significant difference in the performance(considering the grades) ofthe students in their core courses. Thus performance depends on the students' preparedness for the particular course.

CONCLUSION/RECOMMENDATION

Fafunwa (1981), observed that access to qualitative instructions, through supervision in schools, relevant instructional materials, standard school buildings, less crowded classrooms, conducive school environment are some of the major school variables influencing students' academic attainment. He concluded that in the area where good schools are well established, drop-out rate will be drastically reduced and students' academic performance will be enhanced. Kingdom and Maekae (2013) suggested that education should be properly funded to make it produce the desired results which will stimulate national development. Finally, education and its reforms for meaningful contribution to national development should not be politicised.

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