Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.5, No.2, 2014

Perceived Difficulties in Business Statistics and Business Education Students' Performance in Business Statistics in Colleges of Education in South-South, Nigeria.

Dr. OkonUdo Ukpong[1]Stephen Bepeh Undie[2]
Department of Vocational Education, Faculty of Education, University of Uyo, AkwaIbom State-Nigeria
E-mail: histeveundie@yahoo.com

Abstract
Some of the learning difficulties that people interested in Business Education are eager to know are those that are associated with Business Statistics. Perhaps, because Business Statistics is perceived by most students as a course that requires thinking in abstraction. This study therefore investigated perceived difficulties in Business Statistics and Business Education students' performance in Colleges of Education in South–South, Nigeria. Three null hypotheses were formulated and tested at .05 level of significance. The population of this study comprised 860 third year Business Education students offering Business Statistics in six Colleges of Education out of which a randomized sample of 430 was selected. A-25 item questionnaire structured on a four-point scale was used for data collection. A 50-item Business Statistics Performance Test (BSPT) was also used to collect the required data. Both instruments were subjected to face and content validity by three validates. Split-half method was used to determine the reliability of the BSPT. In applying the above method, Pearson Product Moment Correlation and Spearman Brown Prophesy Formula were also used to compute the correlation coefficient and reliability index of r-0.77 and 0.87 respectively. The obtained data was analyzed using t-test for the null hypotheses. The analysis of the null hypotheses indicated among others that:Business Education students differed significantly in their performance in Business Statistics based on difficulties in problem representation. Business Education students differed significantly in their performance in Business Statistics based on difficultiesin statistical calculations. Based on these findings, the study recommended among others that: Business educators should ensure that statistical problems are adequately represented during instruction.Students should intensify efforts towards acquiring procedural and conceptual knowledge pre-requisite for solving simple and complex problems in Business Statistics.
Key words: Perceived Difficulties, Business Statistics,Business Education Students' Performance.

1. Introduction

Students With Learning difficulties (SWLDs) are very general description used widely and without much precision. Merga, (2004) applied the term (SWLDs) to students who have significant difficulties in acquiring literacy and numerical skills. Dada (2006) use the term to refer to students who cannot learn as others due to intellectual, physical or sensory impairments. While Merga, (2004) is of the opinion that learning difficulties (LDs) are those things that inhibit learning and application of knowledge by all categories of learners, Dada (2006) typify SWLDs as those with health-related problems. Within the context of this study, SWLDs has been used in a more restrictive sense to refer to students who are normalyet experience specific obstacles manifested by significant weaknessesin number sense and number operations in Business Statistics.

Viewed from this perspective, the learning difficulties specific to Business Statistics that constitutes the focus of this study include fundamental weakness in statistical problem representation, computations and translations regarded as arising from deficiencies in statistical literacy.Problem representation is the key to problem solving. Organizing and displaying the problem to students in ways that enhance their mental representation can engage appropriate problem-solving process. However, when students are required to represent information in a statistical problem in a form other than the form in which the problem is presented to them. For instance figures and other statistics from the results of existing works using text, tables, graphs, charts and other statistical notations as methods of presenting such information.

What students may find difficult to do is the choice of the method for presenting such information. Determining which of the methods is the most appropriate may depends upon the nature of the problem before them, the amount of data that is being dealt with and their complexity. The choice about whether to use text, tables, graphs or statistical symbols requires careful consideration and students who experience difficulties in the choice of methods for representing statistical problems may end up with incorrect representation. Marshall and Meyer, (2005) posited that theinability to represent a problem accurately can result in unsuccessful problem solving.

Regarding difficulties in computation, many students despite a good understanding of statistical concepts are inconsistent in computing. This may be due to wrong use of statistical formulas, misreading of signs, carrying numbers incorrectly and writing of formulas not clearly enough. According to Kaur, (2001), thechallenges which students often face in carrying statistical calculations included misreading the problems, having difficulty detecting relevant version, irrelevant information, misidentifying the appropriate mathematical operations, making calculation errors, missing steps needed to solve the problem and having trouble organizing the information in the problem.Students with such problems struggle to learn and may not do well in Business Statistics.

For some students, difficulty in learning is driven by problems with translation among Business Statistics representations. This difficulty may be caused by incorrectly executed steps, computations, and algorithms employed in the process of translating from verbal form into symbolic representations and from symbolic to graphical representation as the case may be.Bosse and Cheethan (2011) state that when students attempt to translate from graphs, tables and symbolic representations to verbal form, they are rarely able to do so beyond the context of simple linear functions particularly when the relationship that is being depicted in the non-verbal source representation involves complex statistical operations. The foregoing deficiencies can exist independently or in combination. All can impact on a learner's ability to progress in Business Statistics.

Business Statistics is the science of good decision making in the face of uncertainty and is used in many disciplines such as Business Education. (Jones,2005). It is an integral component and an essential requirement by every area of intellectual endeavor in Business Education. It is also a branch of applied statistics working mostly on data collected as a by-product of doing business. It covers statistical study, descriptive and inferential statistics. It provides knowledge and skills and use statistical techniques in a variety of business applications. In spite of its importance, many students in Business Education frequently exhibit differing levels of specific learning difficulties that tend to limit their abilities in carrying out statistical operations.

Many reasons have been given by different people as being responsible for the difficulties that students encountered in the learning of school subjects that are quantitative in nature.Obinna (2009) explained that students are said to be deficient in Business Statistics when they lack declarative, procedural and conceptual knowledge. According to Kilpatrick (2001) declarative knowledge refers to factual knowledge about statistics. The authors define procedural knowledge as the rules, algorithms or procedures used to solve statistical tasks. The author further explained that conceptual knowledge goes beyond factual knowledge and procedural steps to a full understanding of interrelated pieces of information. Statistical competency requires the development of an interactive relationship between declarative, procedural and conceptual knowledge, the absence of which mathematical operations in Business Statistics becomes difficult to perform.

According to Emeka (2009) students who struggle with learning difficulties in Mathematics-relatedsubjects arelearners who consistently exhibit poor disposition towards curricular activities that are intellectually tasking. Such disposition the author noted can generate worries and concerns that may increase learning difficulties. When learners are worried about the way they learn, their anxiety about their works can decrease the ability to pay attention to things they are learning. Not paying attention to things they have to learn can lead them not to comprehend what they learn, at the end they may perform poorly and graduate without the requisite knowledge and skills.

In describing a typical classroom experience withmany students, Twomey (2006) stated that: the actions which most students exhibit in the learning of school subjects that are quantitative in nature compound their learning difficulties. The author added that many of these students avoid participating verbally during lessons, they do not appear to take an interest in the subject matter, and may not perceive class discussions as learning opportunities. This attitude of the students saves as a defense mechanism from possible humiliation for giving the wrong answer and exposing their academic inadequacies. This unwholesome attitude is further compounded by the inability of most teachers to sustain students' interest in the subject.

Worse still, many students often do not seem to be motivated to study Business Statistics for the sake of acquiring the peculiar knowledge of the subject. This is partly because they can hardly relate Business Statistics so far learnt and in the form it is being handled to their dream of an ultimate job. Individuals with specific learning difficulties also seem to lack effective leaning approaches for coping with the work which some

teachers set for them, resulting in persistently low performance.

Most teachers have tried with little success, on many occasions, to help students learn certain concepts in many disciplines. The case of Business Statistics is a lot more complex because itis a quantitative subject whose contents involve various concepts from different aspects of the subject that must be learnt to be able to achieve the purpose of meeting academic requirements and overcome statistics-related problems common among students in some institutions of higher learning in Nigeria.

Among the six geo-political zones in Nigeria, South-South appears to be one of those areas with colleges of education where students are weak statistically (Obinna, 2009). Similarly, Belema (2007) lamented that the performance of students in Mathematics-related subjects is embarrassingly low in tertiary institutions in South-South, Nigeria.Obinna (2009) also reported that the rate of failure in Mathematics-related subjectsrange between 60 to 75 percent of the school population. The prevalent rate vary considerably from school to school, with some reporting more than 50 percent of their students experiencing problems in learning subjects that require quantitative aptitude (Londen, 2004). The author added that these students have over the years exhibited non-scholarstic characteristics the most commons of which is their failure to acquire adequate proficiency in statistical literacy.

The rationale for teaching and learning Business Statistics is to enable students handle, use and interpret statistical data in their field of study. An additional goal is to prepare students to deal effectively with statistical aspect of the world outside the classroom. Regrettably, these goals have not been fully realized due to certain specific difficulties that have been perceived as variables limiting student's abilities in learning and carrying out statistical operations.

Hollick (2005) affirms this when the author stated that an area of difficulty for many students in Business Education is Business Statistics. In learning Business Statistics, students frequently encounter statistical difficulties involving understanding of concepts, principles, quantitative data representation, calculations, and relationship between concepts, translations and language of instruction. This could cause a problem in the application of the statistical knowledge. Undoubtedly, the innate ability to perform well is impaired in students who have specific learning difficulties associated with Business Statistics,as these learning difficulties not only present problems in coping with academic requirement but could also have far-reaching implications (Twomey, 2006). .

Some teachers and some parents label students who cannot learn as others with derogatory names and may not know what reasons are at the root of the problem. Students with statistics learning difficulties are frequently criticized and denigrated by most teachers and parents and they may be rejected by peers who are quick to perceive who stands out as having quantitative aptitude. This could engender in them higher levels of depression, anxiety, loneliness and low self-esteem. With such impressions in them, they develop a picture of themselves as deficient, different, hopeless and unsuccessful and this could translate to marked variations in statistical literacy and their academic performance.

The impacts of the foregoing has in recent times assumed an alarming proportion and unless concerted research efforts are directed at investigating the extent to which Business Education students differ in their academic performancebased on difficulties in Business Statistics with a view to eliminating its multiplier effects. Continuing difficulties in learning coupled with low self-concept and increasing distress could reduce the motivation to try and a syndrome of learned helplessness may produce indifference to learning and in some cases, energetic avoidance of school work that will result in an increase in unemployable graduates.It is against this background that this study sought to investigate perceived difficulties in Business Statistics and Business Education students' performance in colleges of education in South–South, Nigeria.

This study was guided by the following null hypotheses:

1. There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in problem representation.
2. There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in statistical calculation.
3. There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in Statistical translations.

1.1 Methods

In this study, Survey design was adopted and conducted in six colleges of education inSouth-South, Nigeria. The colleges were Federal College of Education, Obudu, Federal College of Education, (Technical) Omoku, Federal College of Education, Asaba, College of Education, Sagbama, College of Education, Akiedolor and Cross River State College of Education, Akamkpa. The population of the study comprised all the 860 third year Business Education students offering Business Statisticsin six colleges of education for the 2012/2013 academic session.The sample of this study comprised 430 Business Education Students randomly drawn from six selected Colleges of education in South-South, Nigeria.

Two researcher developed instruments were used for the study. They are Perceived Difficulties in Business Statistics Questionnaire (PDBSQ) made up 25 items and Performance Test in Business Statistics (PTBS). The PDBSQ was designed to elicit responses from the respondents on specific learning difficulties generated in line with design of thehypotheses. The PDBSQwas developed on a six point scale of 6,5,4,3,2 and 1 Completely True (CT), True (T), Somewhat True (SWT),Somewhat False (SWF), False (F) and Completely False (CF) respectively.To guide the construction of the items in the PTBS, a Test Blue Print for 50 items was developed and followed strictly. The PTBS had 50 items focused on six areas of Business Statistics and covered the first four levels of the cognitive domain. PTBS was designed to measure student's performance in Business Statistics.The instruments were validated by three validates in University of Uyo. Two validates in Measurement and Evaluation face-validated the instruments while one validate in Business Education carried out the content validity. To ascertain the internal consistency of the BSPT, The reliability of the instrument was determined through Split-half method by which two set of scores were generated on the basis of odd and even number items after which Pearson Product Moment Correlation and Spearman Brown Prophesy formula were then used to determine the correlation coefficient and a reliability index of r-0.77 and 0.87 respectively. Out of the 430 distributed questionnaire, 420 were returned. In the test of hypotheses, a hypothesis with t-calculated value greater than the critical value of 1.96 at 0.05level of significance was considered significant while the hypothesis with calculated t-value less than the table value of1.96 at 0.05level of significancewas not considered significant.

1.1.1 Results

Hypothesis 1

There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in problem representation.

Table one showed that the entire cluster on difficulties in statistical problem representation hadtheir calculated t-valuesgreater than the critical value of 1.96 at .05 level ofsignificance with 418 degrees of freedom.This means that the t-values associated withproblem representation are statistically significant indicating that students without difficulties in problem representation performed better than those with difficulties inproblem representation. Based on this result, the null hypothesis was therefore nullified. This implied that Business Education students differed significantly in their performance in Business Statistics based on difficulties in problem representation.

Hypothesis 2

There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in statistical calculations.

Data in Table two showed that t-calculated values for the five items on statistical calculations are higher than the critical value of 1.96 at .05 level of significance and 418 degrees of freedom. This means that the t-values associated with statistical calculations are statistically significant indicating that students without difficulties in statistical calculations performed better than those with difficulties instatistical calculations. Based on this result, the null hypothesis was therefore rejected. This implied that there was significant difference in the performance of Business Education students in Business Statistics based on difficulties in statistical calculations.

Hypothesis 3

There is no significant difference in the performance of Business Education students in Business Statistics based on difficulties in Statistical translations.

Table three indicated that the t-calculatedvalues for the five items on difficulties in statistical translations are greater than the table value of 1.96 at.05 level of significance and 418 degrees of freedom. This means that the t-values associated with statistical translationsare statistically significant. This indicates that students without difficulties in statistical translations performed better than those with difficulties instatistical translations. Sequel to this result, the null hypothesis was therefore nullified. This implied that Business Education students differed significantly in their performance in Business Statistics based on difficulties instatistical translations.

1.1.2 Discussion

The finding of this study indicates that there exists a significant difference in the performance of Business Education students in Business Statistics based on difficulties in problem representation. To a large extent, this result clearly indicates the difference in students' competencies with regards to problem representation. Students, who get confused when representing some concepts with statistical notation, misplace signs on statistical symbols and cannot use statistical symbols to form and analyze formulas, find Business Statistics challenging since they cannot represent problems accurately relative to students without such difficulties.This finding is supported by Marshall and Mayer (2005) who posited that the inability to represent a problem accurately can result in unsuccessful problem solving.

Analysis of data yields a significant difference in the performance of Business Education students in Business Statistics based on difficulties in statistical calculations. As evidenced in this study,the difference in the performance of students emanate from difficulties such as paying more attention to computational procedures than conceptual understanding, inconsistency at calculating, multiple demands in solving complex problems, having problems in organizing information in a problem and applying the principles which underlie statistical procedures. This finding corroborates with the assertion of Kaur (2001) thatstudents'with Business Statistics difficulties find statistical operations especially calculations challenging for a variety of reasons. These challenges included misreading the problems, having difficulty detecting relevant version, irrelevant information, misidentifying the appropriate mathematical operations, making calculation errors, missing steps needed to carryout the problem and having trouble organizing the information in the problem. It could be deduced from the finding of this study that these difficulties are largely the result of lack of domain-specific knowledge in Business Statistics which explain why students without difficulties performed comparatively better than those with difficulties in statistical calculations in Business Statistics.

The result of this study indicated that there is a significant difference in the performance of Business Education students in Business Statistics based on difficulties in statistical translations. This result shows that the variations in the performance of students is not independent of the challenges associated with statistical translations as evidenced in translating statistical symbols to graph or from graph to statistical symbols, representing tabulated information on graph, getting confused when a non-verbal source representation requires complex statistical translations etc. This finding is in line with Bosse (2001) who posited that when students attempt to translate from graph to table and from symbolic representation to verbal form, they are rarely able to do so beyond the context of simple linear functions particularly when the relationship that is being depicted in the non-verbal source representation involves complex statistical operations, most of which students find challenging to handle and sometimes end up in errors. The errors students make when translating among numeric, graphical and symbolic representation include: manipulation errors, conceptual errors, and errors of omission. These errors and other translations-related problems in the preceding paragraph combine to explain why students' without difficulties performed better than those with difficulties in statistical translations in Business Statistics.

1.1.3 Conclusions

Learning Business Statisticswith understanding is the vision of school Business Statistics. To develop this understanding, teachers and students need to be aware oflearning difficulties associated with Business Statistics. Being aware of student' learning difficulties and their sources will demand Business educators to design instruction to diminish them and also develop learning environments that will promote understanding efficiently.Unarguably, if the business educators into whose hands the students are entrusted fail to device ways to improve students' learning, colleges of education in South-South, Nigeria will continue to churn out poor quality Business Education teachers and the implications could be far-reaching.

Business Education today center among others on its relevance to the individual concerned and the country at large. This is why emphasis is increasingly focused on the quality of potential teachers because nothing can be as important to learning as the quality of teachers in training. If a greater proportion of those who are expected to teach Business Education subjects struggle with learning difficulties as evidenced in this study, it stand to reason that one of the objectives of Business Education which is to produce well-qualified and competent NCE graduates in business subjects who will be able to teach business subjects in our secondary schools and other related educational institutions may not be realized. This is true because such potential teachers will not be able to impact meaningfully on learners due to professional inadequacies.

1.1.4 Recommendations

Sequel to the findings of this study, the following recommendations have been advanced:

1. Business educators should ensure that problems are adequately represented during instructions as this will facilitate clarity, better comprehension and application of the knowledge gained from the concepts being taught.
2. Students should intensify efforts towards acquiring procedural and conceptual knowledge pre-requisite for solving simple and complex problems in Business Statistics.
3. Students should strengthen their declarative, procedural and conceptual knowledge by solving Business Statistics problems repeatedly using different methods.

References

Twomey, R.P. (2006). Arithmetic computation performance of students with learning difficulties: Implications for curriculum.*Learning Disabilities Research & Practice*, 13(4): 68-74.
Obinna, Q.D .(2009). Statistics and learning deficiencies. Jos: Jet publishers.
Merga, U.U. (2004). Statistics learning difficulties.*Learning Disabilities Research and Practice*. 6(9): 100-140.
Marshal, S.P. and Mayer, R.E. (1985).*Mathematical misunderstandings: Qualitative reasoning about quantitative problems*. Amsterdam: Elsevier Science Publishers.
Londein, A. (2004). Principles for the prevention and intervention of statistics difficulties, *Learning Disability Research & Practice*, 16(2): 85-96.
Kaur, B.(2001). KASSEL project reports CNIE-exterior joint study first phase (January 95-October 95). Unpublished research report. Division Mathematics, National Institute of Education, Singapore
Jones, M. (2005).*Addition and subtraction: A cognitive perspective*. Hillsdale, NJ.LawrenceErlbum.
Bosse, T. M. and Cheethan, H. (2011).*Algorithmnization in learning and instruction*. Eaglewood Cliffs, NJ: Educational Technology Publications.
Kilpatrick, T. (2001).After learning: *Causes and consequences of emotional interactions*.New York: Springer-verlag.
Emaka, C.T. (2009).Monitoring attitudes and beliefs in Statistics.Awka: Icon publishers
Dada, M.O. (2006). Understanding learning disabilities and the physically challenged.Agbor: Royal Pace Publication
Belema, T.T. (2007). Understanding students' weaknesses in mathematics-related subjectsinSouth-South, Nigeria.Akoka: Time publications

Table 1:
t-test analysis of the difference in the performance of Business Education students in Business Statistics based on difficulties in problem representation

S/N Difficulties in problem Representation	Students without difficulties			Students with difficulties			t-cal.	t-tab	Remarks
	Mean	SD	n_1	Mean	SD	n_2			
1. I find it challenging to represent a statistical problems accurately	3.49	1.14	227	2.70	0.60	193	11.28	1.96	Significant
2. I get confused when representing certain concepts with statistical notations	3.50	1.03	225	3.02	0.88	195	6.00	1.96	Significant
3. I misplace subscript on statistical symbols	3.82	0.92	236	3.01	1.42	184	7.36	1.96	Significant
4. I find it hard to use statistical symbols to form formulas for calculations	4.14	1.56	250	3.49	0.73	170	6.50	1.96	Significant
5. I have trouble in analyzing statistical formulas	3.00	1.24	268	2.49	0.96	152	5.10	1.96	Significant

Table 2:
t-test analysis of the difference in students' performance in BusinessStatisticsbased on difficulties in statistical calculations

N/S Difficulties in statistical calculation	Students without difficulties			Students with difficulties			t-cal.	t-tab	Remarks
	Mean	SD	n_1	Mean	SD	n_2			
6.I pay more attention to computa-tionalproceduresthan conceptual understanding	3.86	1.61	250	3.04	0.78	170	7.45	1.91	Significant
7. I am inconsistent at calculating	3.28	0.90	230	2.89	1.66	190	3.00	1.91	Significant
8. I find it hard to switch between multiple demands in solving complex problems	3.50	1.25	245	3.14	0.85	175	3.60	1.91	Significant
9. I have trouble organizing the in-formation in a problem	3.91	0.75	220	3.21	0.68	200	11.6	1.91	Significant
10. I have difficulty applying the principles which underlie statistical procedures	3.52	1.12	262	3.00	1.45	158	4.00	1.91	Significant

Table 3:
t-test analysis of the difference in the performance of BusinessEducation students in Business Statistics based on difficulties in statistical translations

S/N	Difficulties in statistical Translations	Students without difficulties			Students with difficulties			t-cal.	t-tab	Remarks
		Mean	SD	n_1	Mean	SD	n_2			
11.	I find it difficult to translate statistical symbols to graph	3.18	1.12	220	2.51	0.68	200	8.37	1.96	Significant
12.	Graphical to symbolic translations are not easy to handle	3.34	0.86	256	2.74	0.78	164	8.57	1.96	Significant
13.	I experience difficulty when representing tabulated information on graph	3.40	1.52	147	3.01	1.34	273	2.29	1.96	Significant
14.	I make mistakes when interpreting graphs	3.54	1.59	220	3.00	0.88	200	4.90	1.96	Significant
15.	I get confuse when a non- verbal source representation involves complex statistical translations	3.48	1.24	228	3.11	0.69	192	4.62	1. 96	Significant