Comparative Effectiveness of Three Assignment Organizational Patterns on Students' Performance in Statistics

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Abstract - *The study investigated the effect of three assignment organizational patterns namely the vertical assignment organizational pattern, the horizontal assignment organizational pattern and the oblique assignment organizational pattern in the performance of graduate students in Statistics of Education during the school year 2015-2016. It aimed to determine if there is a significant difference in the performances in Statistics of Education of the graduate students who were given different types of assignment organizational patterns at .05 level of significance.Three sets of assignments were prepared via the different assignment organizational patterns. A teacher-made test to assess the effectiveness of the assignment organizational patterns was also prepared and given to the students. The students' comparative quiz results were recorded where the mean of each group was computed. The single factor analysis of variance (ANOVA) was used to determine if there is a significant difference between the students' mean performances in Statistics of Education when exposed to the different assignment organizational patterns at 0.05 level of significance. The computed F-value of 7.83 is greater than the critical value of 3.35, indicated a significant difference in mean performances. Post hoc test further revealed that the oblique organizational pattern is better than the vertical organizational pattern. This implies that among the three assignment organizational patterns, the oblique organizational pattern can be used in teaching Statistics of Education for better student performance.*

Keywords: *statistics, education, academic performance*

INTRODUCTION

Statistics is the science of learning from data, and of measuring, controlling, and communicating uncertainty. It provides the navigation essential for controlling the course of scientific and societal advances. Statisticians apply statistical thinking and methods to a wide variety of scientific, social, and business endeavors in various areas such as in education, astronomy, biology, economics, engineering, genetics, marketing, medicine, psychology, public health, sports, among many. Many educational, social, political, economic, and military decisions cannot be made without statistical techniques [1].

In the field of education, student learning is measured more than ever before. This means that the education field needs teachers who have knowledge and expertise in educational statistics and measurement[2].

The course Statistics of Education at the Pangasinan State University - School of Advanced Studies (PSU-SAS) presents basic concepts on the design of experiments, analysis of variance, t or z test and linear regression. It also introduces graduate students to the mathematics of chance. It exemplifies the usefulness of statistics in decision-making particularly in education. Thus, the teaching of the course should not only be confined inside the classroom. Reinforcement and chance for the graduate students to explore are some of the important things that a teacher should always consider for better learning.

Assignment is frequently used by teachers to reinforce learning and give chance for the students to learn on their own. Assignments are tasks given to students by teachers which are intended to be carried out during non-class hours [3]. The most common

purpose of assignment is to have students practice materials already presented in class so as to reinforce learning and facilitate mastery of specific skills [4]. Sometimes, the preparation of assignments introduces the material that will be presented in future lessons. These assignments aim to help students obtain the maximum benefit when the new material is covered in class. Extension assignments involve the transfer of previously learned skills to new situations [5]. On time submission of exercises and assignments indicates that students ensure that they finished their assignments before the class starts [6].

The purpose of giving assignments depends on what the teachers want the students to achieve. Appropriateness of assignment organizational pattern is one of the things that the teacher must consider in preparing the assignments. Assignment organizational pattern is an arrangement which specifies what kind of items should be included [4]. The researcher considered three assignment organizational patterns that could be used in mathematics namely; vertical organizational pattern, horizontal organizational pattern and oblique organizational pattern.

These assignment organizational patterns are operationally defined by the researcher. Vertical organizational pattern is a pattern where items are concentrated on the topic that has been finished that day. Students are given bulk of the experience with a new concept or skill in one concentrated assignment immediately following the presentation of the topic. Horizontal organizational pattern gives opportunity for the students to explore and prepare for the next lesson for it contains items from the next lesson. Students are given the opportunity to explore or challenge themselves with concepts to be discussed the next day. All items in this pattern focus only on the concepts to be discussed the next day. Oblique organizational pattern has items from present lesson or the topic that has been finished that day and items from the next lesson. It is a pattern of assignment involving concepts in the present lesson and future lesson.

The study included the graduate students in the PSU-SAS, Bayambang Satellite who were enrolled in the course Statistics in Education during the first and second semesters of the academic year 2015-2016. The topics covered in the study were Testing About Means of Independent Data, Testing About Means of Dependent Data, and Single-Factor Analysis of Variance.

The researcher aims to determine the effectiveness of these three assignment organizational patterns in the achievement of graduate students in Statistics of Education during the academic year 2015-2016. The result of the study can help the teachers who are handling classes in the School of Advanced Studies to improve, upgrade or enhance the performance of graduate students. It is a common knowledge that majority of the graduate students are teachers of the Department of Education (DepEd). Most of the times, they cannot attend regularly to the weekend classes in the PSU-SAS due to different non-curricular activities that are usually scheduled by the DepEd on weekends. Add to these are the make-up classes done on Saturdays because of suspension of classes due to typhoons and floods.

METHODS

The researcher used experimental method of research in determining the effectiveness of three assignment organizational patterns on the performance of Graduate Students in Statistics of Education during the academic year 2015-2016.

The subjects of the study were 30 graduates student enrolled in Statistics of Education during the academic year 2015-2016. Twenty one of these students were enrolled during the first semester while the remaining nine were enrolled during the second semester.

Three sets of three-item assignment were prepared by the researcher, one set for each assignment organizational pattern. The researcher also prepared three problem-solving teacher-made tests to assess how effective the different assignment organizational patterns are. Students' scores were recorded and added for analysis and interpretation.

To start the experiment, students were given lecture-discussion on the topic Testing About Means of Independent Data then the first set of assignments was given to be submitted on the next meeting. On the next meeting, a quiz was given about the topic. Their scores here represent the students' performance for the first quiz under their respective assignment organizational pattern. After the quiz, the students were given another set of assignment to be submitted the following week. Then on that week, the teacher made discussions about the topic Testing About Means of Dependent Data and another quiz followed after the discussion. Their scores here represent their performance for the second quiz under their respective

assignment organizational pattern. After the quiz, the students were given another set of assignment which is to be submitted the following week. The following week, the teacher discussed the topic Single-Factor Analysis of Variance, but the quiz was given on the following week. Their scores here represent their performance for the third quiz under their respective assignment organizational pattern.

Mean was used to determine the performance of graduate students in the different groups. To determine if there is a significant difference between the graduate students' performance in Statistics of Education when exposed to the different assignment organizational patterns at 0.05 level of significance, the one-way analysis of variance (ANOVA) and Scheffe test were used [7].

RESULTS AND DISCUSSION

The data on mean performance of students when exposed to the different assignment organizational patterns is shown below.

Table 1. Mean Performance of Graduate Students when Exposed to the Different Assignment Organizational Patterns

	Assignment Organizational Patterns			Overall
	Horizontal	**Vertical**	**Oblique**	
Mean Performance	28.6	25.2	31.8	28.53

The data revealed that the mean performance of the graduate students exposed to the horizontal organizational pattern is 28.6; the mean performance of the graduate students exposed to the vertical organizational pattern is 25.2; and the mean performance of the graduate students exposed to the oblique organizational pattern is 31.8. The overall mean performance of the graduate students is 28.53. This indicates that those students who were given assignments via the vertical organizational pattern obtained the lowest mean while those students who were exposed to the oblique organizational pattern got the highest mean. It can also be observed that the mean performance of the students exposed to the oblique organizational pattern is much higher than the overall mean indicating that students in that group performed much better than the rest of the class.

To determine if there is a significant difference in the graduate students' performance in Statistics of Education when exposed to the different assignment organizational patterns at 0.05 level of significance,

Table 2 below shows the observed and the critical values.

Table 2. *Observed and Tabular F-values*

Source of Variation	Degree of Freedom	Sum of Squares	Mean Squares	F_{obs}-value	critical value
Between groups	2	217.87	108.94	7.83*	3.35
Within groups	27	375.61	13.91		

** significant at 0.05*

Based on the table, the observed F-value of 7.83 is greater than the critical value of 3.35. This means that the null hypothesis stating that "there is no significant difference in the students' performance in Statistics of Education when exposed to the different assignment organizational patterns at 0.05 level of significance" is rejected. Therefore, there is at least one pair of assignment organizational patterns that are significantly different.

Pairwise comparison for *post hoc test* using the Scheffé test was made to determine which of the different assignment organizational patterns are significantly different.

Table 3. Comparison test for the different assignment organizational patterns

Paired Groups	**F_{obs}-value**	**critical-value**
Horizontal and Vertical	4.15	6.70
Horizontal and Oblique	3.68	6.70
Vertical and Oblique	15.66*	6.70

** significant at 0.05*

Table 3 revealed that there is a significant difference between the vertical organizational pattern and the oblique organizational pattern. This implies that the oblique organizational pattern is more effective than the vertical organizational pattern. Such result can be explained by the items in the oblique organizational patterns that are focused on the present lesson and concepts to be discussed the next day. Students are therefore encouraged to do some advanced readings thereby making connections between the day's discussion [8] and the next day's lesson. This makes learning more meaningful to students.

CONCLUSION AND RECOMMENDATION

The oblique organizational pattern was more effective than the vertical organizational pattern as far as the giving of assignments to graduate students in Statistics of Education was concerned. This is due to the fact that students find more meaning in their assignments when lessons from current discussions and future lessons are included. There was continuity in terms of concepts, and interconnection between the past and future lessons is established resulting to better understanding and performance.

For a more reliable result, the researcher recommends that parallel studies be made covering the whole course. Similar studies can also be conducted to undergraduate students of statistics. The same study can be made separately to above average group, average group and below average group students to see which of the three assignment organizational patterns is best suitable for each group of students.

REFERENCES

[1] What Is Statistics? http://www.amstat.org/careers/whatisstatistics.cfm Date retrieved: June 16,2015.

[2] Educational Statistics and Measurement, https://goo.gl/0lh0LPDate retrieved: June 16, 2015.

[3] Corpuz, Brenda B., et.al. 2006. Principles of Teaching 2. Lorimar Publishing Inc., Q.C., Metro Manila

[4] Dick, W., L. Carey, & J. Carey. 2001. The Systematic Design of Instruction. (5th edition). New York: Addison Wesley Longman.

[5] Boiser, Diosdada C. 2004. Strategies for Teaching: A Modular Approach. Rex Book Store, Inc., Sampaloc, Manila. pp.99-100.

[6] Laguador, J. M. (2013). Observed Classroom Behaviour as Predictor of the Major Examination Results in Advanced Statistics of BS Industrial Engineering Students. International Journal of Management, IT and Engineering, 3(7), 349.

[7] Walpole, R. E., Myers, R. H., Myers, S. H. & Ye, K. E. (2011). Probability and Statistics for Engineering and Scientists. Pearson Education South Asia Pte Ltd., Jurong, Singapore (Philippine Representative Office).

[8] Pambid, R. C. (2015). Pre-Service Teachers Methods of Teaching Science. Asia Pacific Journal of Multidisciplinary Research, 3(1).