Quantitative Research Process: The Effect Of Classroom Temperature On Final Test Scores

QUANTITATIVE RESEARCH PROCESS 2

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Quantitative Research Process Draft 1

An Assignment

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SOCI312-Methods of Social Research II

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Approval……

The effect of classroom temperature on final test scores of Methods of Social Research II students at the University of the Southern Caribbean

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Running head: QUANTITATIVE RESEARCH PROCESS 2

The quantitative research process is perhaps one of the most fulfilling experiences that any social scientist will engage in. Through this process, one is able to find answers to many of the social questions that arise in day to day life. For the purpose of this assignment, this research process will be explained chronologically and in detail based on the topic “The effect of classroom temperature on final test scores of Methods of Social Research II students at the University of the Southern Caribbean”.

The first step in the research process is to identify the independent variable and the dependent

variable in the given topic. In this case, the independent variable would be “classroom temperature” and the dependent variable would be “final test scores”. At this point, it is imperative that the independent variable also be classified as an active independent variable or an attribute independent variable to ensure that the most suitable research design is implemented for the study. The independent variable “classroom temperature” is classified as an active independent variable as its value can be manipulated by the researcher. In addition to this, the type of research question that is developed will also affect the research design that is selected. For the selected topic, the research question would be as follows- “What is the effect of classroom temperature on final test scores of Methods of Social Research II students at the University of the Southern Caribbean?”

Following this, one must couch their research question and develop a null hypothesis (Ho) and two alternate hypotheses (H1 and H2). The null hypothesis assumes that there is no relationship between the independent and dependent variable. Therefore, Ho would be “there is no relationship between classroom temperature and final test scores of Methods of Social Research II students at the University of the Southern Caribbean”. The alternate hypotheses assume that there is a relationship between the independent and dependent variable. Therefore, H1 would be “There is a positive relationship between classroom temperature and final test scores of Methods of Social Research II students at the University of the Southern Caribbean”. H2 would be “there is a negative relationship between classroom temperature and final test scores of Methods of Social Research II students at the University of Southern Caribbean”.

Based on the abovementioned factors, one can now clearly select an appropriate research design. The research design that would be most appropriate for this topic would be the associational research design. Although it is not as strong as the randomized experimental design which can determine causality, the associational research design can test for the relationship between the two continuous variables in this study. Additionally, the phrasing of the research question that was developed is also indicative of the type of research design that should be conducted. Our research question and hypotheses focus on effect and relationship, as opposed to causality. Therefore, it is most appropriate to use the associational research design.

Subsequently, one can begin to collect data after the research design is selected. For the purpose of this research, a questionnaire would be developed and distributed to a sample population from the class Methods of Social Research II at the University of the Southern Caribbean. In developing this questionnaire, the researcher would include questions that reflect the 4 levels of measurement, which are nominal, ordinal, interval, and ratio. The nominal questions included in the questionnaire would reflect fixed attributes of the participants such as age, sex, or undergraduate student class. Ordinal questions would reflect a ranking of characteristics. These may include values that reflect final grades or culminative GPA. Interval questions for the research would include questions such as

How difficult is it to pay attention during Methods of Social Research II?

Very Difficult Difficult Somewhat Difficult Not Difficult

where each response is assigned a value between 1 and 4, with 1 being very difficult and 4 being not difficult. Ratio questions may take the form of

How many hours do you spend studying Methods of Social Research II material?

0-2 hours 2-4 hours 4-6 hours more than 6 hours

After attaching a score to each of the responses in the questionnaire, the analysis of the data can begin. Using the Statistical Package for the Social Sciences (SPSS) software, the following step would be to identify the measures of central tendency, which are the mean, median, and mode. This is done to identify outlying values in the data set and to determine the dispersion of the data. This simply means that data typically lies around a central value such as the mean. According to Babbie (2010) the most relevant measure of dispersion is the range, which is the distance separating the highest and lowest values in the data set. For our research, identifying the range of test scores can be beneficial in inferring information about the overall performance of the students.

Naturally, as social scientists, it is imperative that we limit the occurrence of error in our research as much as possible. In order to do this, the data collected must be “screened and cleaned”. This means that invalid questionnaires would be removed from the data set by selecting the “exclude cases listwise” function in SPSS. This includes the removal of data that is incomplete, irrelevant or inaccurate in order to prevent bias in the research results. Consequently, the researcher must then determine whether parametric or non-parametric statistical testing will be used to come to a conclusion about the research. Parametric statistics are used when there is an assumed normal distribution and non-parametric statistics are used when there is a skewed distribution. For the purpose of this assignment, parametric statistics will be the most appropriate choice for hypothesis testing.

Subsequently, the researcher can then engage in hypothesis testing, now that the data has been sufficiently cleaned and prepared. Then, the researcher needs to state a confidence interval, which is the degree to which the researcher is willing to be wrong about their hypothesis. The confidence interval can be 1%, meaning that the interviewer is 99% sure about their null hypothesis, or 5%, meaning that the interviewer is 95% sure about their null hypothesis. This confidence interval will need to be input into SPSS when prompted to run analyses of the data. After stating the confidence interval, the researcher can begin running a hypothesis test using SPSS. For this assignment, the P Value approach for hypothesis testing will be used. The P Value approach to hypothesis testing involves using the P value to determine a decision rule. The P Value is the smallest level of significance that the researcher can use to reject the null hypothesis. Therefore, the decision rule states that

If P

If P > ? do not reject Ho

In order to derive the most accurate results for this research question, a t-test would be used to test the hypothesis. However, in order to accurately conduct a t-test, certain statistical assumptions must be fulfilled. Firstly, t-test assume that there is normality in the distribution, meaning skewness and kurtosis was between -1 and 1. Secondly, the t-test assumes that random sampling took place. Thirdly, the t-test assumes that there is independence, and finally, that there is homogeneity of variance. After ensuring that there assumptions have been met, the researcher can run a t-test. Using SPSS, the researcher can select the Analyse tab, then select Compare Means, and finally Independent t-test.

The results of the t test will either be two tailed or one tailed. A one tailed test can have either a left tailed result or a right tailed result. For a right tailed test, H0:μ1=μ2 and H1: μ1> μ2. This means that the rejection region, which is the area where you would reject the null hypothesis, is to the right of the distribution curve. For a left tailed test, H0:μ1=μ2 and H1: μ1

The results for the research process will confirm either the null hypothesis which was " there is no relationship between classroom temperature and final test scores of Methods of Social Research II students at the University of the Southern Caribbean" or one of the alternate hypotheses. Based on the decision rule, after conducting the t-test, if the P value was more than alpha, we would reject the null hypotheses and accept one of the alternate hypotheses which were "there is a positive relationship between classroom temperature and final test scores of Methods of Social Research II students of the University of the Southern Caribbean" or " there is a negative relationship between classroom temperature and final test scores of Methods of Social Research II students of the University of the Southern Caribbean. In presenting the final statistical report, the descriptive statistics would be given, as well as all other relevant values such as the test statistic and degrees of freedom.

Conclusively, the research process, while extensive, can lead to fulfilling results for it's participants and researchers. In the quest for new information, once one has followed the relevant steps in the quantitative research process, one will be a contributor to intellectual growth within one's academic and social community.

References

Babbie, E. (2010). The practice of social research (12th ed.). Wadsworth Publishing. Belmont,

CA.