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Quantitative Data Analysis on Student Centered Learning

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ABSTRACT

This article examines the results of a survey conducted to students in which we identify the student centered learning (SCL) activities which are designed to be co-related with the defined course learning outcomes (CLO) that are required to perform the innovative teaching methods. Using statistical analysis, it examines whether-and to what extent, relationships exist between different categories of SCL activities and CLO. Survey results are then presented regarding to the methods by which students acquire the needed job-related skills and knowledge. This article applies systematic review to summarize the research by performing synthesis on the activities. Results of the review are presented and discussed in the article. The quantitative analysis finds that SCL activities generally shows statistically significant relationship with defined CLO included in this analysis.

KEYWORDS

CLO, Correlation, Hypothesis Testing, SCL

INTRODUCTION

Data analysis is a process of examining, cleansing, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. Data analysis plays an important role in deciding about the activities that the students should be engaged for preparing them to face the future tasks. Thus, the importance of Student centered learning has gained interest among researchers. SCL challenges, students to become active in their learning. Students not only face composite problems to attain new knowledge and abilities, but also develop new ways of thinking and acting. SCL challenges, instructors to release some of their control over the class. They must not only care about the CLO but treat student faults as learning opportunities; and change their role from providers of knowledge to facilitators of learning. These challenges can be discouraging to educators and students who are new to SCL activities because they appear to be dramatically different from the methods of education that most individuals have experienced before (i.e., teacher-centered learning). (Brackenbury, 2012) examined potential commonalities between features of learner-centered teaching and the past significant learning experiences of current faculty. Also (Judia et al, 2013) reports the initial results of research related to student-centered learning in statistics education. (Asoodehb et al., 2012) analyses the effects of student-centered learning on Academic achievement and social skills

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in 2nd elementary using a simple random sampling of one class. These researches motivated to do analysis on the SCL activities conducted to improve the level of teaching in the College of Technology in Oman. (Joaquin et al., 2017) discusses on the implementation of SCL activities in the class session. This article extends the research on the implementation of SCL to the CLO of the course and shows statistically significant relationship between them.

THE PROCESS OF DATA ANALYSIS

Data analysis is a process, of obtaining raw data and converting it into information useful for the decision-makers. (Judd et al., 1989) discusses that Data is collected and analyzed to answer questions, test hypotheses or disprove theories. Statistician (Tukey, 1961) defined data analysis in 1961 as: "Procedures for analyzing data, techniques for interpreting the results, ways of planning and gathering of data to make its analysis easier, more precise or more accurate, and all the machinery and results of (mathematical) statistics which apply to analyzing data."

Data may be numerical or categorical (i.e., a text label for numbers). Data is collected from a variety of sources. The requirements may be communicated by analysts to custodians of the data, such as information technology personnel within an organization. The data may also be collected from sensors in the environment, such as traffic cameras, satellites, recording devices, etc. It may also be obtained through interviews, downloads from online sources, or reading documents. Data initially obtained must be processed or organized for analysis. For instance, these may involve placing data into rows and columns in a table format (i.e., structured data) for further analysis, such as within a spreadsheet or statistical software as in (Neil et al., 2014). Once processed and organized, the data may be incomplete, contain duplicates, or contain errors. The need for data cleaning will arise from problems in the way that data is entered and stored. Data cleaning is the process of preventing and correcting these errors. Common tasks include record matching, identifying inaccuracy of data, overall quality of existing data as discusses in (CRM, 2016) de duplication, and column segmentation as in (Joseph, 2013). Such data problems can also be identified through a variety of analytical techniques. For example, with financial information, the totals for particular variables may be compared against separately published numbers believed to be reliable as that in (Joseph, 2013).

The paper is organized as follows: Section 1 contains the introduction with detailed study of data analysis and the process followed with the motivation to the work. Followed by the testing of hypothesis. The following section contains the research methodology detailing the basis of our research and finally concluding the paper with the conclusion and recommendation for the improvement of the teaching techniques.

TESTING OF HYPOTHESIS

The formula for a test statistic that either exactly follows or closely approximates is a *t*-distribution under the given null hypothesis. Also, the appropriate degrees of freedom are assumed in each case. Each of these statistics can be used to carry out either a one-tailed or two-tailed test. Once the *t* value and degrees of freedom are determined, a *p*-value can be found using a table of values from Student's *t*-distribution. If the calculated p-value is below the threshold chosen for statistical significance (usually the 0.10, the 0.05, or 0.01 level), then the null hypothesis is rejected in favor of the alternative hypothesis. In testing the null hypothesis that the population means is equal to a specified value μ_0, one uses the statistic (Is there enough evidence to support that the SCL activities are co-related). The *t* - value is defines as: