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Constructing Multi-Level Test in Statistics for Level University Grades According to the Three Parameter Model

*Mohammad Olaimat **

ABSTRACT

The research study completely exemplified the concept of multi-level tests in statistics for level university grades according to the three-parameter model. The concept of this approach defines the use or accessibility of multivariate statistical analysis in examining the university grading system. This complete research study examines the use of multiple statistical tools that enlightens the different level outcomes. The concept of university grading system potentially defines the management criterion in terms of implementing marking system. The results that obtained from this study must provide lucrative outcomes. These outcomes must depict the multi-level statistical approach and use of three parameter models in examining the university grading system.

Keywords: Multi-level test, three-parameter model, Multivariate Analysis, University Grading Criteria.

Introduction

In the field of statistics, multi-level test is a great concept that plays a major role in the assessment of excessive amount of the data. However, a proper relationship can be also detected between different variables at the same time (Cohen, West, & Aiken, 2013). All of these tests are varied as different levels, where the effectiveness of these step models are directly associated with the proper outcomes. All of these models can be easily observed as the implications of linear models. This observation is usually made on the possibility related to the use of non-linear models through multiple steps. The outcomes, which were obtained from the models, are usually influenced after the access of different software through obtaining computed outcomes. Similarly, the unit of analysis is completely based upon the nested sample size.

At the most reduced level, multilevel is a specified, frequent, and continuous evaluation approach, which can be assessed through various diverse design methods. This model usually offers the associated form of this any research project for multivariate and univariate analysis regarding the recurrent trials. Alternation in the development of different curves at the individual level can be easily scrutinized with the help of various models. At the same time, these models can be also employed as an alternative to ANCOVA. At this measure, different scores on the diverse and dependent variables are extremely similar to the covariates before analyzing the differences between treatments. All of these models are directly associated with the examination of certain experimentations without the expectation level. Similarly, the regression grades, which are mostly obtained through ANCOVA approaches plays a significant role. Such data can be easily examined with the help of different levels. However, the possibility of second level models within repetitive measures can be also assessed. For the assessment of the university grades, the usage of different multilevel tests are used within the statistical analysis that are directly associated with providing outcomes with the help of multiple steps. Three parameter models can be easily used for examining different levels of the grades and its efficacy within the research study (.Dunn, & Clark,2009)

1. MATERIALS AND METHODS

For conducting specific research study that enlightens the existing grading criteria, the appropriate method can examined the university system associated to research objective. The accurate research criteria must use to evaluate the overall procedure. Research design is an effective approach that predominantly defines the nature of research approach. To assemble the data details, the past studies have focused that helpful in identifying the nature of research studies. However,

* Department of Psychology & Especial Education, Al-albait University, Faculty of Education. Received on 29/7/2016 and Accepted for Publication on 19/11/2016.

in this study, the university grading system has been significantly examined. The requirements of this study can be fulfilled with the presence of accurate research approach that can potentially analyze every individual step to maintain the high precision and accurate results. The aim of research study has based on secondary approach that critically portrays the appropriate information from past studies. The design followed by this study is an exploratory and descriptive research.

- The descriptive research also employs the phenomenological research for recognizing and describing the need of competitor analysis. The use of research design is obvious in every research study because it provides proper and systematic approach in conducting research study.

- The study also employed exploratory research approach, which helped in retrieving relevant theories around the topic and in gaining a better understanding of the prior research on the competitor analysis.

The research design has based on two different methodologies such as qualitative and quantitative methodology. The qualitative data will be collected by conducting surveys. Furthermore, the quantitative data for descriptive study will be gathered by using questionnaires from different websites and online journals. The combination of both research approaches will help in addressing the research question of the study. The primary purpose of an inductive approach is to allow the researcher to search for frequent themes emerging in the qualitative raw data, without the limitations forced by organized practices. It also helps in establishing evident links between the research objectives and the frequently merged themes in the raw data (Green,.,& Salkind,2010).

1.1. Data Collection

For achieving the successive study and its approaches, the university grading criteria comprised on different strategies that need to be evaluated from this study. The procedure of data collection requires appropriate tactics that pragmatically consider the main objective of this study and portrays the clear significance through data which comprises on university grading criteria. There are various approaches that can provide optimum quality of results. However, depending on the research nature of information to be assimilated, multiple instruments or tools are used to conduct different types of data. The main goal for using different types of tools is to provide collective information, appropriate knowledge, and evaluate various opportunities for continuous improvement. The study focused on different methods, which potentially evaluate better data collection method. However, the study enlightens the use of mixed methodology, so the use of multiple data collection methods must be obvious. However, for using the multilevel tests, the management of university committee has to use various data collection approaches. These approaches are different in terms of their collecting data on appropriate basis. In this study, the collection of data has been categorized in terms of qualitative and quantitative, where different approaches are used to collect the research information appropriately (Gay, Mills& Airasian,2009),.

1.2. Qualitative Research

Methods of qualitative research work on the collection and analysis of non-numeric data. Such as, observation, interviews, and videos. Which based on different purposes and beliefs.

Qualitative researchers don't accept the view that the world is stable, coherent and consistent. They see that all the meanings are found in particular content.

They don't Adjust and treat the attitude of the research. Furthermore, the number of participants in the qualitative research is few because they collect the data by intensive methods through Organizing and installing the data in certain descriptive units like interviews and observations.

Qualitative research is standing a large number of variables over a long period of time to capture the richness of qualitative research and the point of views for the member of the samples. This type of research seeks to work deeper into site of the research to get an understanding of the prevailing conditions in the site of the research, their reason and how the participants realized them.

(Aboalam ,2013),.

The use of qualitative research is obvious, when researcher's collects data at some place where the possibility of physical adapt collection is unobvious. The use of qualitative research is significantly focused on ethnography and face-to-face interviews that further codes in to numbers and statements. It comprised on different types of observational and other

related theories. The basic objective of this study is to explore the social cases.

1.2.1. Observations

In observation method, the observers record all data on individual tasks. This is qualitative approach, where ethnography study is strictly followed. The researchers select some point, where he/she observes the target respondents. This requires selected time at which he/she (the researcher) needs to complete it research study. It is routine wise process, where researchers collect daily readings and observe it according to their maintained policies. However, this study significantly focused on targeted respondents which must be university students. The data is collected after daily observations, and will further use for analysis purpose. This data also provides leading issues and changes by using robust tactics. The grading criteria and the student satisfaction level can be examined through their student results (Healey, 2014).

1.3. Quantitative Research

Quantitative research methods based on collection and analyzing of digital data. You get the data from using the questionnaires, testes or checklists. It includes the identification of the hypotheses, which will be tested. As well as working to adjust the factors that may affect on data collection. And it used a large number of participants in the samples to obtain statistic data and avoiding the personal bias factors when the data are collected (Aboallam, 2013).

The purpose of quantitative research is to deal with numerical data and diagnose it by using statistical significant tools. It totally enlightens the methodological principles of various theories that define multiple structures. The research design of quantitative based on austere solutions that significantly diagnose the main research problems. The collected data will further investigate by using multiple statistical techniques that provides good results.

1.3.1. Interviews

In interviews, the researchers directly communicate with the targeted respondents. The categories of interviews has categorized in two types. In direct interviews, the researchers ask multiple questions to the respondents and collect data simultaneously. Some targeted questions must ask to the respondents, where the obtained results collect at respective manner. The interview session will enlighten potential factors which comprised on student GPA, checking criteria, paper and several other correlated factors. This must provide lucrative outcomes that can accessible for researcher to analyze the grading criteria of university. This is the most feasible way, where the researchers can directly observe respondents feelings, expressions and any other prevailing issues appropriately. The chances of misinterpretation are less because direct communication in between investigators and respondents has been placed that can verifies individual steps accurately (Jackson,2011).

It is important to carry out the whole research on the basis of research design because it provides sound information in conducting research study. It also provides extensive support to the researchers for using appropriate tactics for conducting any research study. It also defines proper data collection which is significantly helpful in obtaining data through valid sources. The use of research design is highly obvious in every research study that signifies the overall result in appropriate way. In this study, the grading criteria of university can potentially evaluated on the basis of mixed methodology such as qualitative and quantitative. The results that would attain from these two methods must provide higher amount of accurate results. The grading criteria and the existing strategies can examined on the basis of these two research methods.

Research methodology is an essential part of any research. More simply stating, research methodology is a comprehensive plan that incorporates procedures from formulating and stating the research question till the time researchers have discovered answers for them. The research in the study was conducted using a mixed methodology research selected according to the nature of the problem or study and the desired study objectives. Methodology is one of the most essential elements of any research study. The methodology of a specific research study is a systematic technique in which information or data is collected and gathered so that the research questions can be answered or the research hypothesis can be proved accordingly. In simple words, the methodology of a research study is a map or a sketch which helps an individual in executing the study in a proper flow or in an organized manner to gather all the necessary information which can help in answering the research objectives(.

Mixed methodology research approach refers to a holistic research (Lind, Marchal, &Wathen, 2006), a process

containing an array of methods and commitments. Therefore, this research is piloted by mixing the qualitative and quantitative research approaches. There are various researchers and scholars who rely on the notion that mixed methodology research process is not unethical and it can be employed in any study with the needs of objective. Thus, it can be argued that it is safe to use both qualitative and quantitative research approaches in any study. Instead, the nature of the research question and objectives of the proposed research must need to be wisely checked before applying any research methodology. This will help in attaining the desired objectives for the proposed study. However, the student grading system can enlightened the major attributes of their working strategies.

1.4. Data Analysis

The concept of data analysis in any research study fulfills the results criteria and potentially provides better results for examining the research objective. The analysis of collected data requires various operations that gives a proper shape which possibly feasible for researchers to analyze it suitably. In this study, the idea of university grading system can be evaluate on the basis of collected data. The steps include editing, coding and tabulation that usually covers the research objective. After collecting and assembling the required data, it would further analyze by using different statistical research tools that examine the data appropriately. Moreover, in this study, the use of different statistical must require that can effectually examine the research objective and provide better results in examining the main concept of study (Marcoulides, & Schumacker. 2013).

1.5. Types of Multivariate Analysis

For obtaining multilevel tests on research objective, there are various statistical approaches that operate the multiple steps through different tests. The concept of multi-level test defines the structural working requirements of collected data that portrays the pertinent information associated to data. However, the presentation of different steps provides complete details related to university grading system. There are various statistical measures in statistics that examined the overall data on the basis of multi-level steps. The concept of multivariate test momentarily evaluates the collected data and provides better results through different hierarchal structures. These tests further provide hierarchical structure that determines the multiple stage tests. In this scenario, where multiple grades of university students have been peculiarly examined the grading criteria of university students (Muthen, (2011). The collected data initially assembled, and then further analyzed by using different multivariate methods. There are various types of multivariate analysis that used to understand different range of data set with the help of different multivariate analysis methods which are as follows:

- MANOVA
- Principal Component Analysis
- Canonical Correlation Analysis
- Correspondence Analysis
- Multidimensional Scaling
- Discriminant Analysis
- Linear Discriminant Analysis
- Clustering System
- Statistical Graphs

1.5.1. MANOVA

MANOVA (Multivariate Analysis of Variance) defines multiple cases when there is a presence of more than one dependent variable. This method has exemplified an association of multiple dependent variables with independent variable. However, the presence of multiple explanatory variables must be obvious in this study. The dependent variable is defined as grading criteria of students. Through MANOVA, the analysis of multiple variances can be examined on the basis of various independent variables. The results that attained from this approach will provide meaningful and lucrative results (Weiss& Weiss 2012).

1.5.2. Principal Component Analysis

Principal Component Analysis defines new set of different orthogonal variables that possess identical information to

the original set (Jackson, 2011). It replaces the axes of difference to give a novel set of orthogonal cuts, orderly so that they abridge lessening quantities of the dissimilarity. Through PCA, the possibility of examining the individual university grades is effectually obtained through this test.

1.5.3. Canonical Correlation Analysis

In Canonical correlation analysis, the linear association among two subsets has identified. It is the formatted version of bivariate correlation where two variables' relationship are identified and how they correlate with each other.

1.5.4. Correspondence Analysis

In Correspondence analysis, the reciprocal sets of all individual variables that have used and define the existence of linear relationship. This model assumes chi-square distribution that defines the existence of accepting test statistics.

1.5.5. Multidimensional Scaling

In multidimensional scaling method, different algorithms and set of pairwise variables distance has been recorded. This is also known as principal coordinate analysis.

1.5.6. Discriminant Analysis

In Discriminant analysis, the set of variables has been identified whether they able to possess some relations or how they easily distinguish two sets of variables.

1.5.7. Linear Discriminant Analysis

It computes linear analyst from two given sets of normally distributed variables or data to allow for cataloging of new or different set of observations.

1.5.8. Clustering System

It assigns objects in to different groups such as clusters. The clusters information has treated individually that provides maximum range of results, which can further use in analysis purposes.

1.5.9. Statistical Graphs

This multivariate approach significantly provides multiple charts and graphs that can easy to interpret and understand effectively.

These are different statistical multivariate analysis approaches that study different sets of data and provide high quality feasible results. The obtained results are effective in terms of making strong interpretations. These are all feasible multivariate analysis methods through which the university grades can potentially obtain through appropriate way. The grading system is the most influential approach, which identifies on austere basis. The relevant multilevel tests can effectually provide significant results in understanding the criteria of tests scores that comprised on different grading system (Ware, & Brewer, 2013)

2. RESULTS

2.1. Ethical Considerations

Ethical considerations form an integral part of drawing out the methodology of any research, and are placed among the top priorities of the research plans and guidelines. In business research study, the consideration of ethical standards and practices are necessary for the researches and studies. All the ethical issues, which the researcher might encounter, are dealt with in the best possible way. Research ethics and standards define the systematic way in which any research is carried out (.McKenzie, 2012) the norms, values and guidelines, necessary for the research conduction are an inherent feature of the ethical consideration for the researches. Ethical considerations are the most conclusive surfaces of every research study that augments the credit of the performance of the investigator through the research study. Furthermore, it must be taken into explanation that the researcher is answerable for the moral deliberation when gathering secondary evidence from the beforehand showed research studies. It must be taken into explanation that a diversity of moral disagreements are always devoted with the investigation study rendering to which the researchers usually have to deliver evidences against the rights of the detractors connected to the presence of fabricate data in the every research. The ethical consideration has significantly based on reliability, confidentiality and several other things, where the researchers has to gathered required data of respondents by following all ethical values. It is indicated that these controversies may escort to

the malfunctioning of the research project if the researcher is not capable to appropriately defend his position with valid reckoning. This fact induces the need of informed consent as well as privacy of the participants (Salkind, 2012).

2.2. Research Ethics

For observing the participants, it is mandatory to follow the ethics, which can be effectual for both investigators and the selected respondents (Bohm, & Zech, 2010). The researcher has to implement all their observing strategies by using the ethics because it is mandatory to collect the observation by using these research techniques. The research ethics are as follows:

- While observing the participants, the observer has to avoid unethical gestures that would not appreciate in other ethnic groups.
- Avoid nonverbal communication, which can negatively affect the organization multi ethnic employees.
- Do not share or leak the credential information of the organization multi ethnic employees.

These are three significant ethics that have to follow the investigators while observing the attitude, expression and opinions about the organization.

2.3. Informed Consent

In business research analysis, the use of Informed consent obtained from all participants and every contacted technician voluntarily participated in this research at their discretion. It is an important component of research and is an integral part of the research process. Researchers should educate their participants in order for them to make an informed decision regarding their participation in the research. Participants must provide informed consent freely and without force and with clear comprehension of what participation entails. For the study, the researchers implemented the practical steps to ensure that all participants are educated and must have knowledge regarding the questionnaire plot. The deterring human errors and its effects on aeronautical training programs must base on informed decision.

2.4. Confidentiality

Confidentiality is an important component that requires focused attention within the research process. The researcher will carefully consider confidentiality in the proposed study for both qualitative and the quantitative phase. The qualitative sample will include a purposeful selection of samples based on their knowledge of the central phenomenon. The selection will ensure the confidentiality and privacy of the participants. The researcher used content validity to examine questions guiding the study (Ragasa, 2008). This process addressed the match between test questions and the content or subject area they are projected to measure. The researcher also used internal consistency reliability to gauge dissimilar survey items intended to measure the same characteristic. The results of this research may determine future research related to how maintenance training is perceived and how maintenance training affects the overall morale of maintenance technicians. The selection ensured the confidentiality and privacy of the participants.

2.5. Limitations

The research that based on grades program should contain a defined conceptualization of the university faculty and education all over the state. Various articles will be useful in such a study. The researcher analyzes the identified articles that portray a study of grading system by using the content of the analysis. The qualitative data reduction and sense-making efforts forms the major part in the content analysis. Content analysis will help the researcher to discover the main theme in the volume of the written data (Samuels, Witmer, & Schaffner, 2012). It can be implemented across all the four disciplines in the university grading system program. The researcher will use qualitative analysis to get the analysis of the article sources in the research Social Research Theory, Methods and Techniques. The nature of the education calls for the researcher to constantly examine the research from outside the specific discipline. Qualitative research provides the best technique to explore the study in the university grading discipline (Vogt, & Johnson, (2011)

The limitation of a research method is important to consider when selecting the method of data collection. The main challenge in using qualitative data collection method in this research lies in the dependability on the questions formulated for the interview process. The adequacy of the answers the researcher gets from the study will depend on the willingness of the researcher to get into the unknown. The researcher has to look into things in the unconventional way from different

vintage points. The method may be too cumbersome since it involves an intensive interview and therefore, may take a lot of time. However, the best results expected out of the research work are the valid and reliable information. Qualitative provides reliable information. The researcher will induce valid research conclusion because of the wide range of information obtained in data collection. The study is considerably focused on student grading system through multilevel statistical tests.

2.6. Three Parameter Model

The use of three-parameter model in statistics that identifies the mutual responses of multiple variables. Three parameter model usually denotes the three significant dimensions which represents as x , y and z . In examining the university grades, the grading system, teachers paper checking and international criteria are three momentous variables which define the overall approach in examining the main concept of research study ((Lind, Marchal, &Wathen, 2006).

2.7. Validity

Validity is the most essential facet of the research study that is indispensable to ensure the genuineness of the research findings. However, the researcher highlights the validity of the research findings in order to ensure the positivity of the research. It is a degree at which an evaluation tool generates consistent and stable results. Reliability is defines as stability or consistency of the given data set or test scores. It is identified by different tests and internal consistency. This defines content validity as the exactness of the research instruments in order to deal with the research phenomenon. The researcher highlighted a variety of strategies in order to verify the validity of the research findings including comparison of findings as well as joint observations.

Furthermore, this is remarkably valuable to eradicate risk of unintended biasness in the elucidation of the research findings. However, it should be noticed that the overall process of ensuring validity of the research findings is time consuming and require watchful attention of the researcher. But it should be considered that the inclusion of this process in the research is critical to declare the genuineness of the research findings ((.Dunn, & Clark, 2009).

2.8. Reliability

Reliability is the necessary part of the research that reflects the consistency and regularity of a measure in a particular research. It shows that how well any test evaluates and what is supposed to measures. Validity is defined as accuracy of the interpretations or inferences that make from the test scores. It is based on different analysis just to evaluate how things are valid. It is based on four different types of validity. However, it should be noticed that the reliability is more essential in quantitative studies as compared to the qualitative studies. However, it has most important role to play in qualitative research as well. According to different researchers, the reliability measures the permanence of the research findings to the extent up to which the same results are obtained through the repeated administration (.Dunn, & Clark, 2009).

3. CONCLUSIONS

The above study has critically enlightened the overall approach and the associated factor of multi-level tests. The conceptualization of overall multivariate analysis has been predominantly examined the use of university grading criteria. The result that must attain from the overall study defines the university grading system. This system defines the university management criterion in terms of explaining different strategic rules and tactics in grading system. Multiple variables have been pragmatically obtained from these multi-level or multivariate analysis results, which includes GPA system, marking criteria, obtained scores, and several other factors that somehow correlates or have an influence on university grading criteria. Ethical considerations are the most decisive facets of the research study that enhances the recognition of the behavior of the researcher throughout the study (Ware, & Brewer, 2013). Moreover, it should be taken into account that the researcher is accountable for the ethical consideration when collecting secondary information from the previously conducted studies. It should be taken into account that a variety of ethical controversies are always attached with the research study according to which the researchers usually have to provide proofs against the claims of the critics related to the inclusion of falsify data in the research. The study recommended to use Qualitative methods in future researches.

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تصميم اختبار متعدد المراحل الإحصائية لقياس مستوى طلبة الجامعات وفقاً لنموذج الثلاثي المعايير

محمد علييات *

ملخص

قدمت الدراسة مفهوم الاختبار متعدد المراحل الإحصائية لقياس مستوى طلبة الجامعات وفقاً لنموذج ثلاثي المعايير. يحدد مفهوم الاختبار ضمن هذا الإطار استخدام التحليلي الإحصائي المتعدد في تقييم نظام الدرجات الجامعي. ويهدف البحث إلى دراسة الأدوات الإحصائية المتعددة التي تستخدم لتحديد مختلف المسويات. حيث يعتمد نظام الدرجات الجامعي على نظام العلامات. وقد خرجت هذه الدراسة بنتائج مهمة تعكس استخدام النظام الإحصائي المتعدد في فحص نظام الدرجات الجامعي. الكلمات الدالة: الاختبار متعدد المراحل، النموذج ثلاثي المعايير، التحليل المتعدد، نظام لدرجات الجامعي.

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