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# Predicting The Students Learning Outcome Based on Comparing the Assessment Methods in Diploma E-Commerce Course, Community College, King Khalid University, KSA

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Abstract—Student Learning outcomes describe what students should know, be able to do, and value by the end of their educational program. This study was designed to determine (1) which assessment method: continuous assessment (in the Form of daily in-class quizzes), cumulative assessment (in the form of Online and offline assignments), or project based learning, best predicted student learning outcomes (dependent upon Final Grades). Participants, included 43 students, enrolled in E-Commerce diploma Course, Department of Information System belongs to community college under King Khalid University. A stepwise regression model was used to establish the relationship between the predictor variables which are independent variables (continuous, cumulative, project based learning assessments) versus the outcome variable which is dependent variable (Final Grade).

*Keywords*—Student Learning, Continuous assessment, cumulative assessment, Stepwise Regression Model

## I. INTRODUCTION

The emphasis on student learning and retention at the diploma college level is slowly beginning to flourish in King Khalid University, Abha region, Saudi Arabia. Students are struggling with the transition from high school to college level courses In the context of this study, continuous assessment is an assessment method that is implemented frequently in an effort to promote students to study and review their course materials more often. Continuous assessment in this study was implemented in the form of daily class hour quizzes containing questions from the previous class hour lecture material and previous day night's homework. The questions from previous day night's homework are an unannounced one. Azorlosa and Renner[1] describe a study conducted by Marchant[2] in which announced and unannounced quizzes were administered to a class. The class scored nearly 20% higher on the quizzes that were announced and reported to have read the assigned material more closely if a quiz was anticipated. In addition, Ruscio[3] asserts that daily announced quizzes can promote reading ahead.In the context of this study, cumulative assessment is an assessment method which assesses student learning on the material from the first day of class at a consistent rate throughout the course. It is important to space cumulative assessment to achieve better student performance. It allows students to space their learning and to study and relearn the material a little bit at a time. These benefits have had the greatest effect on lecture style classes, suggesting that students who take cumulative assessments would outperform 67% of the students who do not take the assessments [4]. In the context of this study, project based learning is an assessment method in which students' understanding the course is assessed by completing a project under a given title. This project work developed student's conceptual understanding about the course and that enabled them to apply their skills to problems outside of the classroom. Stephens and Konvalina[5] conducted a study on assessments as predictors of study learning. They examined how short weekly quizzes, projects and assignments towards final exam influenced student success in their mathematic courses.

## II. RESEARCH METHODOLOGY

### *A. Purpose of the Study*

The purpose of this study was to determine which assessment method: continuous assessment in the form of daily in-class quizzes and cumulative assessment in the form of on-line quizzes and assignments for the specific time interval, project based learning in the form of submitting the report about a specific topic and the laboratory programs for each topic related to the subject content, best predicted student learning in a diploma e-commerce course.

### *B. Participants*

The sample included 43 students of level 5 diploma college under king Khalid university enrolled in a course entitled "E-Commerce" in the Fall Semester 2014. This course is a traditional lecture-style course for one semester. The class met 4 days a week for one hour theory session for 2 days and two hours practical session for 2 days.

### *C. Procedures*

The students were given pre-tests of every second day of class throughout the semester. These tests contain 15 to 20 questions in the form of multiple choices and match the followings or descriptive patterns. There are totally 14 quizzes (totally 14

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Weeks for a semester). These questions were embedded into the final exam also. This average mark counted for 10% of their course grade. The pre-test (Mid- term Exam) is the part of the final grade that consists of 6 daily in-class quiz questions. This mark counted for 20% of their course grade. The teacher taught directly from the text book mentioned in the university syllabus, which was the source of all pre-tests questions. In the mean time, totally 10 assignments carrying minimum 5 questions in the form of descriptive pattern are given to the students in a constant period of time to improve the writing skills and reading skills. These assignments improved their knowledge in the theory part and prepare them how to present the answers for their final exam and let them know the possible ways of how the questions will be. This cumulative assessment mark counted for 5% of their course grade.

The students are also required to complete a project on the given title "E-Commerce Websites and Payment Methods" related to the courses content and the mark allotted for this project work was 10. The purpose of the project was for the students to develop their skills not only in the theoretical part but also they should know how the e-commerce technology is useful to the society and how to utilize these features practically. Students were asked to submit their reports of their searching and findings. The student was awarded by the rubric values set by the teacher for differentiate the works done by the students. We found maximum student's report was excellent. This project mark was added with the practical score and totally 15% was counted of their course grade.

## III. Results And Analysis

### *A. Variable*

We begin our analysis by defining and examining the relationships among our variables. The cumulative assessment, continuous assessment, and project scores make up our three predictor variables, or independent variables. The variable that we wish to predict the outcome of, the final score is our dependent variable. Each student's average of the 10 cumulative assessment scores make up the cumulative assessment variable, and each student's average of the 14 daily in-class quizzes make up the continuous assessment variable. The continuous assessment, cumulative assessment and project scores were the three predictor variable or independent variables.

The Final score was the dependent variable. Each student's average of 10 assignments scores made up the cumulative assessment variable and each student's average of 14 daily in-class quizzes made up the continuous assessment variable. The central measures of tendency for the variables are shown in table I.

### *B. Grader Reliability*

When determining the dependence that one variable has on another, we use the Pearson product-moment correlation coefficient; or more simply, the Pearson correlation. The Pearson correlation, (denoted by a lower-case r) acts as a scale as to how dependent one variable is on another. The correlation has values between -1 and 1, where a Pearson correlation of -1 corresponds to the increase (decrease) in value of one variable depending entirely upon the decrease (increase) in value of another respectively, a Pearson correlation of 0 corresponds to no dependence at all, and a Pearson correlation of 1 corresponds to the increase (decrease) in value of one variable depending entirely upon the increase (decrease) in value of another respectively (Cohen & Cohen, 1983).

TABLE I: CENTRAL MEASURES OF TENDENCY

| Items | Mean | Median | SD | Range |
|---|---|---|---|---|
| Pre-test | 14.24 | 15.00 | 3.673 | 14 |
| Cumulative Assessment | 7.15 | 7.18 | 1.595 | 6 |
| Continuous Assessment | 7.85 | 8 | 2.248 | 8 |
| Project | 11.44 | 12.00 | 2.847 | 10 |
| Post – Test | 76.07 | 78.00 | 13.923 | 59 |

The grader reliability between the graders for the pre-test and post – test were calculated using the Pearson product – moment Correlation. A high correlation between the graders was present for the both pre – test ($r = 0.657$) and the post – test ($r = 0.657$). Here the value of r is positive. This means that there is a positive fairly high degree of correlation relationship between the grader variables and also the sig. (2-Tailed) value is 0.000. This value is less than 0.05. The data showed no violation of normality and linearity. Because of this, we can conclude that there is a strong, statistically positive significant relationship between the pre-test and post-test.

### *C. Hypothesis testing and Statistical Significance*

Multiple Regression Model is used to predict the value of a variable based on the value of two or more other variables. The variable we want to predict is the dependant variable and the variables we are using to predict the value of the dependent variables is called the independent variables. An F-test ($F=52.36$; $p<0.$) performed on the multiple regression model confirmed that the followed assessment methods accurately determined post-test [Final] scores.

Statistical significance testing shown in table II shows that only the continuous assessment predictor and project predictor are significantly related to post-test. Simply, only the continuous assessment scores and project scores are accurate predictors of student's post-test performance. The results of the statistical significant t-test for the stepwise regression model are shown in table III. Since the regression coefficient of the continuous assessment variable was larger than that of the project variable in the stepwise regression model, it was thus concluded that student's continuous assessment scores best predicted their post-test scores.

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TABLE II: MULTIPLE REGRESSION MODEL – SIGNIFICANCE TEST

| | Cumulative Assessment | Continuous Assessment | Project |
|---|---|---|---|
| t-statistic | -0.7596 | 8.0265 | 3.3625 |
| p-value | Rejected | <0.0005 | <0.01 |

**TABLE III: STEPWISE REGRESSION MODEL SIGNIFICANCE TEST**

| | Continuous Assessment | Project |
|---|---|---|
| t-statistic | 7.8005 | 3.1656 |
| p-value | <0.0005 | <0.01 |

## IV. CONCLUSION

The main finding of this study was that the continuous assessments, in the form of daily in-class quizzes, were the primary predictor of student's post-test scores. The students completed the cumulative assessments at home and on-line. This allowed them to work the questions at their own pace within the boundaries of the time that the assignment made available. Students who were unable to complete assignments on their own knowledge may have copied other student's work without attempting to learn and understand the material. In addition, students may have taken a lot of time to complete the cumulative assessments and thus struggled with time on the final exam where time was more limited. This may explain why the cumulative assessment variable was not statistically significant, and thus, was eliminated from the model. The stepwise regression model was proven to be statistically significant with a 99% confidence level. This suggests that if teachers implement daily in-class quizzes and projects, they will be able to use these scores to better predict how their students will perform on final exam. This allows teachers to determine early in the course (based on quiz and/or project performance) what material students have mastered and what topic need further attention.

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