Case Study
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ICLASS LEARNING MANAGEMENT SYSTEM FOR TEACHING ENGINEERING MATHEMATICS DURING COVID 19 A LAGOS STATE UNIVERSITY EPE CAMPUS CASE STUDY

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ABSTRACT

Coronavirus has shocked the world and almost bought the education sector to a stop. The Nigerian government declared a compulsory lockdown on all states of the federal. The Lagos State Government's passion for education consulted Envivo Education, a private company, to develop an I class Learning Management System (ILMS) for virtual teaching. This platform was effective in teaching courses, but the peculiarity of engineering is the basic to understand engineering mathematics the bedrock of all concepts. A Motivated Strategies for Learning Questionnaires (MLSQ) survey was administered to all students who took the engineering mathematics courses. The data was collected, and the statistical analysis was done with Minitab. It found out that the ILMS is good for teaching courses, but to understand engineering courses screenwriting and feedback from students should be included.

Keywords: Engineering mathematics, Motivated Strategies for Learning Questionnaires, Minitab, The Lagos State Government, Envivo Education, I class Learning Management System

1. INTRODUCTION

The COVID-19 has devastatingly affected worldwide education. Educational institutes all around the world are compelled to quickly move from the conventional

way of educating to an internet learning format. The COVID-19 pandemic circumstance has presented exceptional challenges requiring teachers to adjust to teaching online.

Simply for the advantages of academic headways, learning management framework (LMS) has been around being used in different nations all over the planet. However, it is met with its reasonable portion of obstacles. Acknowledgment of LMS is as yet sketchy, as apparent in a review led by Alghamdi and Bayaga, which showed an outright absence of specialized abilities among the more established age to receive its full rewards. Sarwar et al. (2020).

ICT teams in the university should begin learning management systems (LMS) and foster a decent client relationship the board device for help. Many universities may not be prepared for the fall henceforth move to organizations with information and assets and earliest to try not to depend on the customary conveyance models in computerized and cutthroat occasions. Nabukeera (2020)

König et al. (2020) presents that the COVID- 19 pandemic situation has just made visible what the consequences will be if schools fail to catch up with the fundamental ICT transformation process. Therefore, it will be crucial to provide learning opportunities in professional development for teachers and in training for future teachers.

Buckless and Ravenscroft (1990) studied the contrast coding a refinement of ANOVA in behaviour analysis. Reliance on the default coefficients of ANOVA is valid and beneficial for explor- atory research. As theories are developed and refined, however, researchers should develop explicit hypotheses regarding the form of the relationships between indepen- dent and dependent variables.

The COVID-19 pandemic has constrained establishments to move from conventional to online learning. Despite this, numerous public advanced education organizations do not have full admittance to online LMS. The research is an endeavour to explore the genuine utilization of online media for supporting formal, i.e., sole and official, scholastic correspondence in open advanced education in Egypt, utilizing the nine universities giving the travel industry and lodging single guy instruction as the contextual investigation Sarwar et al. (2020).

Estimated the quality of a prediction made by ANOVA or MLR seems much more doubtful than the prediction itself. Similar contradictory examples are constructed for the multivariable linear regression (MLR). However, for these constructions, it seems difficult to verify the Gauss–Markov assumptions, which are standardly required for MLR. Gurvich and Naumova (2021).

Shenoy et al. (2021) presented one way ANOVA is used to check the significance of observations obtained from model simulations with various combination of physics schemes hereafter termed as treatments. Results from ANOVA are reported with 90% confidence intervals and are deemed significant at $p < 0.10$.

In this study, Effective Dissemination of Engineering Mathematics by Iclass Learning Management System during Covid 19 a Lagos state University Epe Campus Case Study was conducted by the one-way ANOVA.

2. MATERIALS AND METHODS

Mathematics is the bedrock of science and engineering. All undergraduate in Engineering are Compulsory to take Engineering Mathematics that is part of their curriculum in the BMASS by National Universities Commission. A Motivated Strategies for Learning Questionnaires (MLSQ) survey was administered to all

students at the end of the course. A total of two hundred and twenty-six students partakes in the Questionnaire. It was developed by the google form for easy access by the student. The data analysis was done Using the Minitab statistical software. The One-way ANOVA at 5% significant level to determine the significant difference among the student level.

3. MODEL FOR THE DATA

$$x_{ij} = \mu_i + \varepsilon_{ij} \quad i = 1,2,\dots a \; j = 1,2,\dots n \qquad \textbf{Equation 1}$$

$$x_{ij} = \mu + \tau_i + \varepsilon_{ij} \;\; i = 1,2,\dots a \; j = 1,2,\dots n \qquad \textbf{Equation 2}$$

Where:

$$x_{ij} = the\ ijth\ observation$$

$$\mu_i = the\ mean\ of\ the\ ith\ factor\ level$$

$\varepsilon_{ij} = is\ the\ random\ error\ component\ that\ incorporate\ all\ other\ sources\ of$

$variability\ in\ the\ experiment$

3.1. ANALYSIS OF THE FIXED EFFECTS MODEL

$$x_{i.} = \sum_{j=1}^{n} x_{ij} \quad i = 1,2,\dots a \qquad \textbf{Equation 3}$$

$$\overline{x_{i.}} = \frac{x_{i.}}{n} \quad i = 1,2,\dots a \qquad \textbf{Equation 4}$$

$$x_{..} = \sum_{i=1}^{a}\sum_{j=1}^{n} x_{ij} \quad i = 1,2,\dots a \; j = 1,2,\dots n \qquad \textbf{Equation 5}$$

$$\overline{x_{..}} = \frac{x_{..}}{N} \qquad \textbf{Equation 6}$$

Where:

$$x_{i.} = the\ total\ of\ the\ observation\ under\ the\ ith\ treatment$$

$$\overline{x_{i.}} = the\ average\ \ of\ the\ observation\ under\ the\ ith\ treatment$$

$$x_{..} = the\ grand\ total\ of\ all\ the\ observation$$

$$\overline{x_{..}} = the\ grand\ average\ of\ all\ the\ observation$$

3.2. HYPOTHESIS

$$H_0:\ \mu_1 = \mu_2 = \cdots = \mu_a \qquad \textbf{Equation 7}$$

$$H_1: \mu_i \neq \mu_j \, for \, at \, least \, one \, pair \, (i,j)$$ **Equation 8**

3.3. SUM OF SQUARES

3.3.1. TOTAL SUM OF SQUARES

$$SS_T = \sum_{i=1}^{a}\sum_{j=1}^{n}\left(x_{ij} - \overline{x_{..}}\right)^2$$ **Equation 9**

$$SS_T = \sum_{i=1}^{a}\sum_{j=1}^{n}(\overline{x_{i.}} - \overline{x_{..}})^2 + \sum_{i=1}^{a}\sum_{j=1}^{n}\left(x_{ij} - \overline{x_{i.}}\right)^2$$ **Equation 10**

$$SS_T = n\sum_{i=1}^{a}(\overline{x_{i.}} - \overline{x_{..}})^2 + \sum_{i=1}^{a}\sum_{j=1}^{n}\left(x_{ij} - \overline{x_{i.}}\right)^2$$ **Equation 11**

$$SS_T = SS_{Treatments} + SS_{Error}$$ **Equation 12**

$$SS_T = \sum_{i=1}^{a}\sum_{j=1}^{n} x_{ij}^2 - \frac{x_{..}^2}{N}$$ **Equation 13**

3.3.2. SUM OF SQUARES OF TREATMENT

$$SS_{Treatments} = n\sum_{i=1}^{a}(\overline{x_{i.}} - \overline{x_{..}})^2$$ **Equation 14**

$$SS_{Treatments} = \frac{1}{n}\sum_{i=1}^{a} x_{i.}^2 - \frac{x_{..}^2}{N}$$ **Equation 15**

3.3.3. SUM OF SQUARES OF ERROR

$$SS_{Error} = SS_T - SS_{Treatments}$$ **Equation 16**

3.4. MEAN OF SQUARE

3.4.1. MEAN OF SQUARE OF TREATMENT

$$MS_{Treatments} = \frac{SS_{Treatments}}{a-1}$$ **Equation 17**

3.4.2. MEAN OF SQUARE OF ERROR

$$MS_{Error} = \frac{SS_{Error}}{N-a}$$ **Equation 18**

3.5. F-VALUE

$$F_o = \frac{MS_{Treatments}}{MS_{Error}} \quad \textbf{Equation 19}$$

3.6. FISHER

$$LSD = t_{\frac{\alpha}{2},N-a}\sqrt{\frac{2MS_E}{n}} \quad \textbf{Equation 20}$$

Table 1

Table 1 Data for Analysis							
Rate the Envivo Platform for Virtual Teaching							
Level	1	2	3	4	5	6	7
200	24	11	16	18	25	8	11
300	4	1	9	14	12	5	4
400	5	3	8	10	18	9	11

4. RESULTS AND DISCUSSIONS

From **Table 2** Using a significance level of 5%, P>0.05 there is no significant difference in the level. The impact of the I class Learning Management System across each level of the student who participated in Courses is the same. The Platform Virtual Teaching

As shown in Figure 1, From the comparison of the pair of means, All the pair of mean, 300 vs. 200, 400 vs 200 and 400 vs 300 are not significantly different at 95% confidence intervals.

In the Figure 2, Residual Plot, the residual is not normally distributed, it is observed that all points are not closer to the straight line. This signifies that the assumptions are violated. There is some relationship between the size of the residuals and the fitted values. Also, there is the outlier in the residual plot. Thus, the assumptions are violated.

Table 2

Table 2 Analysis of Variance					
Source	**DF**	**Adj SS**	**Adj MS**	**F-Value**	**P-Value**
Factor	2	1120	560.2	0.91	0.418
Error	21	12923	615.4		
Total	23	14043			

Figure 1

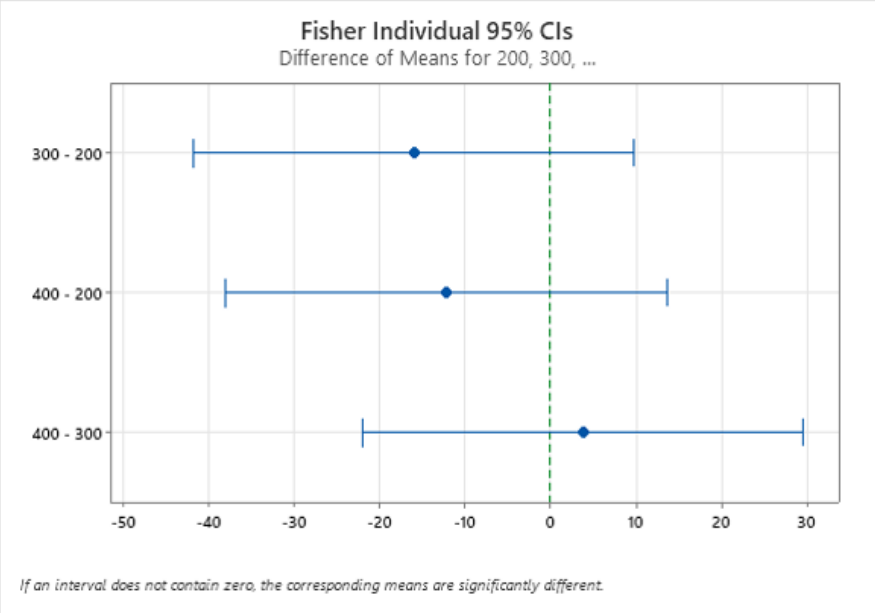

Figure 1 Fisher LSD Method and 95% Confidence

Figure 2

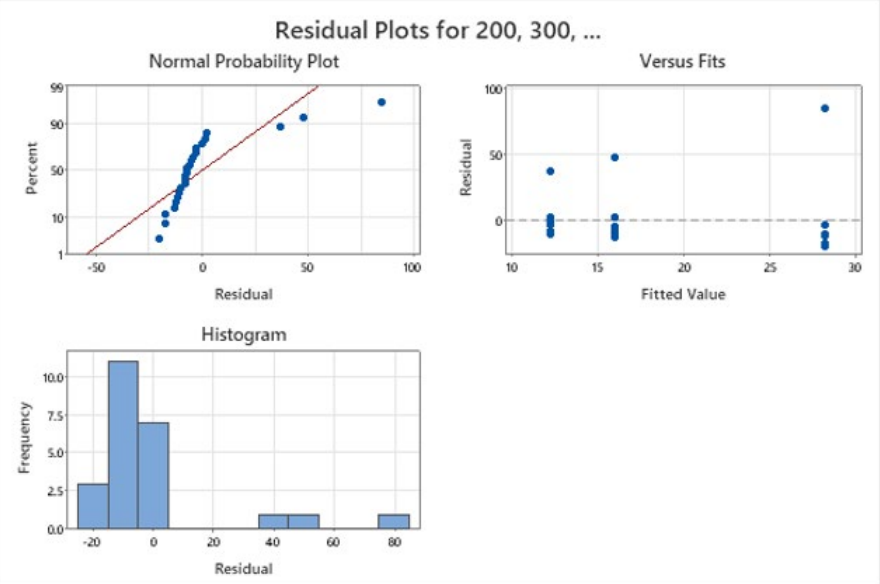

Figure 2 Residual Plot

5. CONCLUSIONS AND RECOMMENDATIONS

In this study, Effective Dissemination of Engineering Mathematics by I class Learning Management System during Covid 19 a Lagos State University Epe Campus a Case Study. One-way ANOVA approach to analyse the result from the Motivated Strategies for Learning Questionnaires. There is no variation in the mean across the various student's level. The I class Learning Management System is good choice to teach engineering courses across any level for students.

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