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Analysis of Agile Concept Application in Lectures Conduction at UTM Jakarta and STIKOM CKI

Miswanto[1*], Nova Tri Romadloni[2]

[1]Computer Engineering, Universitas Teknologi Muhammadiyah Jakarta, Indonesia.
[2]Informatics, Muhammadiyah University Karangananyar, Indonesia.

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Abstract: In today's fast-paced tech world, it's important to understand and adapt to new methods like Agile. Agile is commonly used in project and product management to help with planning, executing, monitoring, and completing projects based on user needs. This approach can also be applied in education, especially in classroom lectures. This research examines how Agile is used in lectures at UTM Jakarta and STIKOM CKI Jakarta. It looks at students' understanding of Agile, their creativity during lectures, and the impact of a new curriculum on classroom learning. To analyse this, the study used descriptive statistics to measure students' understanding of Agile, a correlation test to see connections between different aspects of lectures, and a regression test to examine the new curriculum's impact. The goals are to 1) Measure students' understanding of Agile concepts. 2) Assess students' creativity in class, and 3) Analyze how curriculum changes affect classroom activities. Results show that students have a moderate understanding of Agile, and their creativity is evident in how they apply concepts, document work, and present material. The regression model shows that the new curriculum has a positive impact on classroom learning, and the findings are valid and reliable. Overall, Agile methods can enhance learning and creativity in the classroom.

Corresponding Author:
Miswanto
Email: miswanto@utmj.ac.id

INTRODUCTION

In this era of rapid technology, we are required to be able to understand and adapt methods or concepts that are currently booming. One method or concept that is widely applied in the field of project and product management is the Agile method or concept (Binar Academy, n.d.) . Where the application of the Agile method or concept is to assist in the process of planning, implementing, monitoring and completing a project based on mutually agreed user needs. There are several fields that have not widely applied the agile concept in the process and implementation. For example, in education area, the concept has not adapted in the process and implementation (Escobar-sarmiento & Linares-vásquez, 2012).

An example for agile implementation in education area is developing an information system of student monitoring in one of Islamic Boarding Schools in Balikpapan (Esa et al., n.d.). Other examples of simple agile methodology adaptation of web application development to develop Internship Information System (Fariz Iqbal & Putro, n.d.). It makes it easier for college students to find which company has an internship program. In terms of rules, there are several agile methods which can be done by stakeholders to improve the quality of teaching and learning process (Sharp & Lang, 2018).

We can see the transformation of curriculum changes by the Ministry of Education, Culture, Research and Technology that is previously using Curriculum 13 to Curriculum Merdeka (Kemdikbud, n.d.). Those examples for the implementation related to the implementation based on project management area for developing some application software (Ciupe et al., 2018). And for the Curriculum changes nearly implement for new concept and new adaptation for all the students under Ministry of Education, Culture, Research and Technology. For that change, all the education area will be impact with the new regulation and new business process related to teaching and learning process (Sharp & Lang, 2018).

The purpose of this research is to analyse the process of applying the Agile method or concept to the process of implementing lectures at the Muhammadiyah University of Technology (UTM) Jakarta and STIKOM Cipta Karya Informatika (CKI) Jakarta. The application analysis is carried out to see the extent to which students understand the Agile method or concept, find out the level of student creativity in the process of implementing classroom lectures, and find out whether there is an impact of new curriculum changes on teaching and learning activities on the implementation of classroom lectures.

The method used in this research is to conduct descriptive statistical tests to see summary statistics (Mishra et al., 2019) about the level of understanding of Agile methods or concepts among students. Then conduct a correlation test to see if there is a relationship between variables in the context of the implementation of class lectures. Based on the problem mentioned in this research, we conduct analysis for Agile method or concept that can be implemented in the education area to make sure all the students can understand about Agile. They also can be more proactive in the teaching and learning process (Dermawan et al., 2022).

This research can open new insights for students about examples of applying agile methods or concepts to the implementation of lectures. And a reference for lecturers to be able to apply this concept in teaching and learning activities by providing interactive learning materials based on the development of the curriculum currently used by the campus. Based on the results of the regression tests, residual histograms and P-P plots conducted in this study, we can conclude that the regression model applied to evaluate the impact of the new curriculum on the implementation process of teaching and learning activities in the classroom shows valid and reliable results. The near-normal distribution of residuals corroborates the validity of the model and supports the finding that the implementation of the new curriculum has a significant impact on the process of implementing teaching and learning activities. This can be supported by applying Agile methods or concepts in the implementation of lectures at the UTM Jakarta and STIKOM CKI Jakarta.

METHOD

The research is carried out by quantitative approach by using technique or instrument from questionnaire, agile concept conducting is periodically monitored as supporting data from several references. And from start until finish, this research using literature study, descriptive statistical analysis, and evaluation using correlation and regression test to make sure all the problem questions can be answered related to analysis result data.

To identify a research gap in the analysis of Agile concept application in lectures at UTM Jakarta and STIKOM CKI, it's essential to consider the current state of Agile methodologies in education, particularly in some universities for examples, and where opportunities lie for further investigation. Here are a few potential research gaps and angles for this study:

- Current literature often generalizes Agile's benefits in education without distinguishing its effectiveness across different types of courses (e.g., technical vs. non-technical). Analyzing its impact on various course types at UTM Jakarta and STIKOM CKI could reveal whether Agile is universally beneficial or more suited to specific disciplines.
- Agile methodologies often emphasize team collaboration, iterative processes, and flexibility, which can be challenging to university into traditional lecture formats that focus on structured delivery. Few studies have examined how Agile principles can be adapted for lecture-based courses specifically.

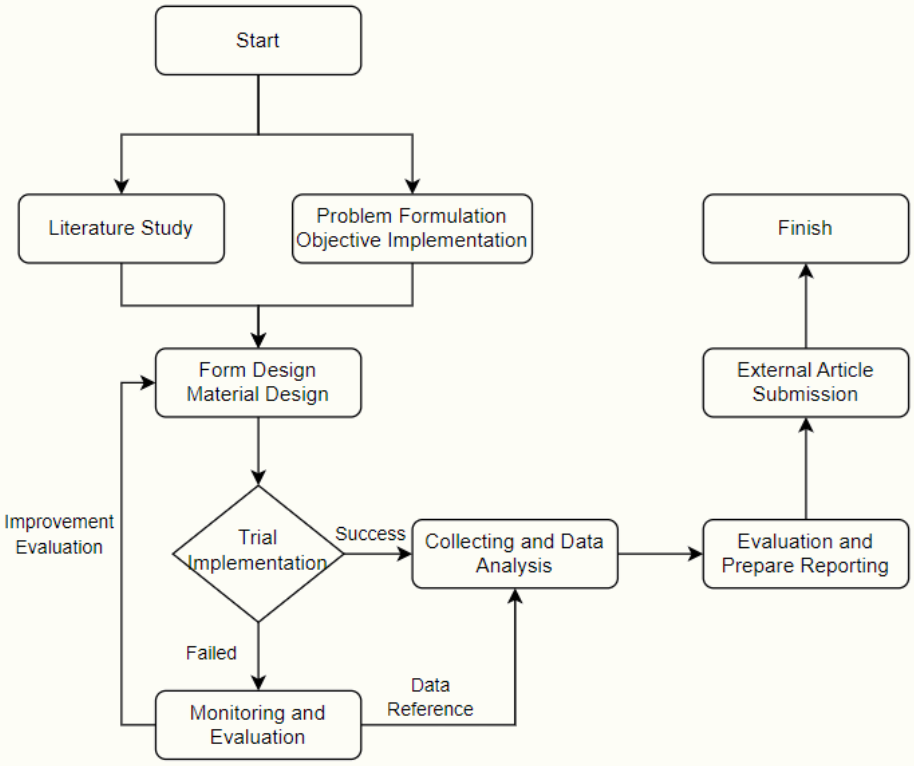

Figure 1. Research Flow Chart

There are several steps that can be carried out as contained in the flowchart with the explanation are:

1. Literature study
   The step is carried out to gain a comprehensive understanding about agile application in education, students' knowledge level about agile and analysis of data obtained from the result of research.
2. Problem formulation and object implementation
   The step is carried out to address problems that occurred in the process of a new curriculum from the Ministry of Education, Culture, Research and Technology. Enforcing the problem is carried with

additional information from the students and direct observation connected with agile. It is implementing trials in the lectures to obtain the objective of the research.

3. Form and material design
   The step is carried on the form and material design which is designing the form and material within format terms that are used and list of questions about agile knowledge. There are several indicators; is agile needed in several certain courses, how the conduction agile process can be understood by the students, and how they can follow lectures implementation with a new concept. Meanwhile, to distribute the form by sending the link or paper form to the right respondent.
4. Trial application
   The step is carried to test the application agile concept in one of or several courses that writers took to get valid data in the learning teaching process.
5. Evaluation and Monitoring
   The step is carried out when the application trial feels less than optimal then the evaluation will be done later to do redesign in the learning form or material so the content is improved. Evaluation will be on the implementation process, before using agile method or concept and after using agile method or concept with the data from student response.
6. Data Collecting and Analysis
   Information and data collection for the questionnaire has been conducted for three months at Universitas Teknologi Muhammadiyah (UTM) Jakarta and Sekolah Tinggi Ilmu Komputer Cipta Karya Informatika (CKI) Jakarta. The information collection and questionnaire data were carried out for three months in the campus. These had been done before processing or calculating data by students based on needs. Then, a thorough calculation process needed from collected data in the previous steps. We conduct analysis data using descriptive statistical method, correlation test and regression test to make sure analysis result based on variable of this research such as concept understanding, concept implementation, documentation, material implementation, etc.
7. Evaluation and Report Compilation
   The process is done after analysis results then report of research compilation based on input obtained from trial process, implementation and output result. For the analysis, we conducted descriptive statistical tests to see summary statistics about the level of understanding of Agile methods or concepts among students. Then conduct a correlation test to see if there is a relationship between variables in the context of the implementation of class lectures. And finally, a regression test is carried out to compare and see if there is a relationship between the application of the new curriculum and other relevant variables in the context of implementing learning on the UTM Jakarta campus and STIKOM CKI Jakarta.

RESULTS AND DISCUSSIONS

Based on the period of questionnaire data collection of UTM Jakarta and STIKOM CKI Jakarta students, final data that were collected are 74 respondents. With details and discovers as follows:

1. Details of Statistical Data

Total data collected in this research was 74 respondents. With the details of data collected: 40 students from STIKOM CKI Jakarta or 54.1% from total respondents and 34 students from UTM Jakarta or 45.9% from total respondents. From the total 74 data respondent, 72 valid data were obtained and 2 duplicate data were ignored. So that the analysis process is carried out is 72 data obtained from UTM Jakarta and STIKOM CKI Jakarta.

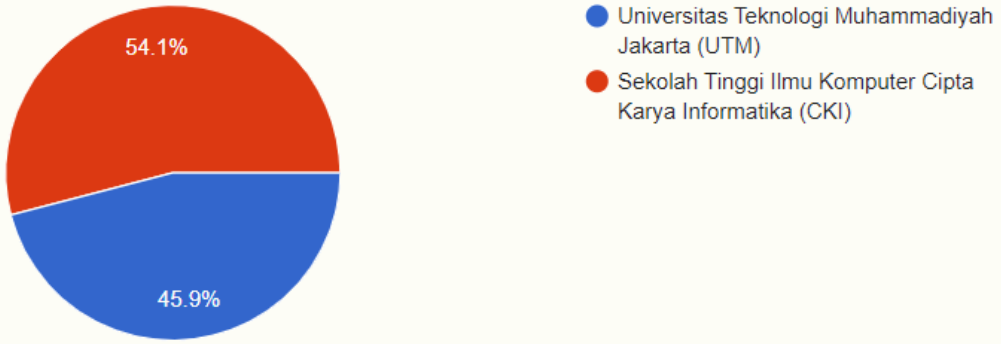

Figure 2. Total Research Respondents

2. Problem Formulation

a. Do current students understand the concept of Agile? We want to make sure students know and understand about Agile concept.

b. How do you know the level of creativity of students regarding the current teaching and learning process? We want to make sure students aware for learning and teaching that already running still can be improved using Agile concept, based on university needs for their improvement.

c. Could the new curriculum have a significant impact on the teaching and learning process in lecture classes? We want to make sure students understand about a relationship between the implementation of the new curriculum and the teaching and learning process in the classroom during lectures.

3. Data Finding and Pre-processing Steps

Responden	Pemahaman Konsep Agile				Penerapan Konsep Agile				Uji Coba Penerapan Agile			Dokumentasi Materi Pembelajaran			Penyampaian Materi		Penerapan Materi			Rata-rata							
Pertanyaan	1	2	3	4	1	2	3	4	1	2	3	1	2	3	1	2	1	2	3	Pema	Pene	Uji Col	Doku	Penya	Penerapan	Ma
1	1	2	1	1	3	2	1	3	3	3	2	3	3	3	3	3	3	3	3	1,25	2,3	2,67	3	3	3	
2	1	2	2	1	3	1	3	1	3	3	2	3	3	3	3	3	2	2	3	1,5	2	2,67	3	3	2,3	
3	1	2	2	3	3	1	3	3	3	1	2	3	3	3	3	3	2	2	3	2	2,5	2	3	3	2,3	
4	1	2	1	1	3	1	3	1	3	3	3	1	3	3	3	3	2	2	3	1,25	2	3	2,3	3	2,3	
5	1	2	2	1	3	1	3	1	3	2	3	3	3	3	3	3	2	2	3	1,5	2	2,67	3	3	2,3	
6	3	3	1	1	3	1	3	3	3	2	3	3	3	3	3	3	3	3	2	2	2,5	2,67	3	3	2,7	
7	3	3	1	2	3	1	3	1	3	1	2	3	3	3	3	3	2	2	3	2,25	2	2	3	3	2,3	
8	3	3	1	2	3	1	2	3	3	3	2	3	3	3	3	3	2	2	3	2,25	2,3	2,67	3	3	2,3	
9	3	3	1	1	3	1	3	1	2	2	2	2	3	3	3	3	2	2	3	2	2	2	2,7	3	2,3	
10	3	3	1	1	3	1	3	1	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	3	3	
11	3	2	1	1	3	1	1	1	1	3	2	1	3	3	3	3	3	3	3	1,75	1,5	2	2,3	3	3	
12	2	2	1	1	3	1	3	2	2	3	2	2	3	3	3	3	2	2	3	1,5	2,3	2,33	2,7	3	2,3	
13	1	2	1	1	3	1	3	1	3	2	2	3	3	3	3	3	2	2	3	1,25	2	2,33	3	3	2,3	
14	3	2	1	1	2	1	2	1	2	2	2	3	3	2	2	3	3	2	2	1,75	1,5	2	2,7	2,5	2,3	
15	1	2	2	1	3	3	3	3	3	3	2	3	3	3	3	3	2	2	3	1,5	3	2,67	3	3	2,3	
16	3	3	1	2	3	2	3	2	3	3	3	3	3	3	3	3	3	3	3	2,25	2,5	3	3	3	3	
17	3	3	1	1	3	1	3	1	3	1	3	3	1	3	3	3	3	3	3	2	2	2,33	2,3	3	3	
18	3	3	2	2	3	1	3	3	3	1	3	3	3	3	3	3	3	3	3	2,5	2,5	2,33	3	3	3	
19	3	3	1	1	2	1	3	1	3	2	2	2	3	3	3	3	2	2	3	2	1,8	2,33	2,7	3	2,3	
20	3	3	1	2	2	1	3	2	3	1	3	2	3	3	3	3	3	2	3	2,25	2	2,33	2,7	3	2,7	
21	1	1	2	1	3	2	3	1	3	2	3	3	3	3	3	3	3	2	2	1,25	2,3	2,67	3	3	2,3	

Figure 3. Data Pre-Processing

1) First question is using a descriptive statistical test (George & Mallery, 2018), such as analysis of descriptive statistics to see summary statistics about Agile concept understanding level between the students, such as mean, median, and standard deviation standard (de Winter & Dodou, 2017). The results are as follows:

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pemahaman Konsep	72	1.25	2.75	1.7951	.43872
Valid N (listwise)	72				

The table above shows the descriptive statistics for the variable "Understanding Concepts". The following is an explanation of each column in the table:

- N: The number of samples or observations, which in this case is 72. This indicates that the data consists of 72 respondents or entries.
- Minimum: The lowest score of the variable "Conceptual Understanding", which is 1.25. This means that in this sample, the lowest score obtained for Conceptual Understanding is 1.25.
- Maximum: The highest value of the variable "Understanding Concepts", which is 2.75. This means that in this sample, the highest score obtained for Concept Understanding is 2.75.
- Mean: The mean of the variable "Understanding Concepts", which is 1.7951. This is the middle value that represents the centre of the sample data for this variable.
- Std. Deviation: The standard deviation of the variable "Concept Understanding", which is 0.43872. Standard deviation measures how far the data is spread out from the mean value. The higher the standard deviation, the greater the variation or dispersion in the data.

In other words, the mean value of Understanding Concepts is 1.7951 with a low of 1.25 and a high of 2.75. The data has a variation (dispersion) of 0.43872 from the mean. The value of the correlation coefficient to see how strong the relationship is. Values are between -1 and 1, where 1 indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 indicates no correlation.

To answer the question of whether current students have understood Agile concepts based on the descriptive table above, we need to assess the mean and standard deviation of the Understanding Concepts score.

- Mean: The mean score of Understanding Concepts is 1.7951 on a scale of 1.25 to 2.75. Without context regarding the measurement scale, it is difficult to determine exactly whether this score indicates good understanding. However, if we assume the scale is 1 (no understanding) to 3 (very good understanding), the average score of 1.7951 is around the middle of the scale. This may indicate that the students' understanding of Agile concepts is moderate or medium, not yet reaching a good or excellent understanding.
- Standard Deviation: The standard deviation of 0.43872 indicates that there is variation in the level of understanding among students. While some may have a good understanding, others have a low understanding, resulting in a moderate mean score.

To ensure a better understanding, we can consider:

- Looking in more detail at the distribution of individual scores.
- Using additional criteria or clear benchmarks for what counts as "getting it" or "not getting it".
- Conducting additional analysis, such as looking at the frequency distribution to see how many are actually in the "got it" versus "didn't get it" category.

Based on this data, it can be generally concluded that the students' understanding of Agile concepts is not high and is at a moderate or medium level. For a more accurate assessment, a clearer interpretation of the scale or additional analysis is required.

2) For the second question, we can use a correlation test to see if there is a relationship between the creativity variable and other relevant variables in the context of the teaching and learning process (Sharp & Lang, 2018). The variables used are "Application of Agile Concepts", "Documentation of Learning Materials", "Delivery of Materials", and "Application of Materials", because they are all related to the process of teaching and learning activities. The value of the correlation coefficient to see how strong the relationship is. Values are between -1 and 1, where

1 indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 indicates no correlation. For the details, we can check this explanation below:

Table 2. Correlations

		Application of Concept	Documentation	Delivery	Application of Material
Application of Concept	Pearson Correlation	1	.318**	.133	.012
	Sig. (2-tailed)		.007	.264	.923
	N	72	72	72	72
Documentation	Pearson Correlation	.318**	1	.347**	.084
	Sig. (2-tailed)	.007		.003	.485
	N	72	72	72	72
Delivery	Pearson Correlation	.133	.347**	1	.182
	Sig. (2-tailed)	.264	.003		.125
	N	72	72	72	72
Application of Materials	Pearson Correlation	.012	.084	.182	1
	Sig. (2-tailed)	.923	.485	.125	
	N	72	72	72	72

Explanation of the Pearson Correlation result:

The correlation graph displayed is a Pearson correlation table for the variables Application of Concepts, Documentation, Delivery, and Application of Materials. The following is an explanation of the table:

a) Application of Concepts:
   - With Documentation: The Pearson correlation is 0.318, which is significant at the 0.01 level (p-value = 0.007). This indicates a significant positive correlation between Application of Concepts and Documentation.
   - With Delivery: Pearson correlation of 0.133, not significant (p-value = 0.264). This indicates a weak and insignificant positive correlation between Application of Concepts and Delivery.
   - With Application of Materials: Pearson correlation of 0.012, not significant (p-value = 0.923). This indicates almost no correlation between Application of Concepts and Application of Materials.

b) Documentation:
   - With Delivery: Pearson correlation of 0.347, which is significant at the 0.01 level (p-value = 0.003). This indicates a significant positive correlation between Documentation and Delivery.
   - With Application of Materials: Pearson correlation of 0.084, not significant (p-value = 0.485). This indicates a weak and insignificant positive correlation between Documentation and Application of Materials.

c) Delivery:
   - With Material Applicability: Pearson correlation of 0.182, not significant (p-value = 0.125). This indicates a weak and insignificant positive correlation between Delivery and Application of Materials.

d) Application of Materials:
   There were no significant correlations with other variables. Overall, this correlation table shows that:

- There is a significant positive relationship between Application of Concepts and Documentation, as well as between Documentation and Delivery.
- The other correlations are weak and insignificant.
- It should be noted that correlation does not indicate a cause-and-effect relationship, but rather only indicates the existence of a linear relationship between two variables.
- To find out the level of creativity of the students towards the current teaching and learning process based on the correlation table given, we need to look at the relationship between the relevant variables that may reflect creativity. Here are the steps to analysed them:
    i. Identify Relevant Variables: In the given correlation table, we have variables such as Application of Concepts, Documentation, Delivery, and Application of Materials. Students' creativity could be related to the way they apply concepts, document their work, and how materials are delivered and received.
    ii. Correlation Analysis: We will see if there is a significant correlation between these variables that could indicate the level of creativity. A significant correlation indicates a possible relationship with creativity in the learning process.

e) Interpretation of Results:
- Application of Concepts and Documentation: Pearson correlation of 0.318 which is significant (p-value = 0.007). This indicates that concept application is positively related to documentation. Students who are good at applying concepts tend to document their work well, which could be an indicator of creativity.
- Documentation and Delivery: Pearson correlation of 0.347 which is significant (p-value = 0.003). This suggests that good documentation is associated with effective delivery. Creativity in documentation may also reflect creative ability in delivery.

However, there is no direct data on creativity in this correlation table. Therefore, we can assume that creativity may be reflected in the way students apply concepts, document work, and present material. The significant correlation between these variables may indicate that these aspects are interconnected, which could be an indicator of creativity in the teaching and learning process.

3) For the third question, regression tests can be used to compare student learning performance before and after the implementation of the new curriculum, or to see if there is a relationship between the implementation of the new curriculum and other relevant variables in the teaching and learning context (Hazzan Oritand Dubinsky, 2019).

Table 3. Summary Model[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569[a]	.324	.273	.32272

Notes:

a. Predictors: (Constant), Application of Material, Application of Concept, Delivery, Documentation and Concept Understanding.
b. Dependent Variable: Trial

The results of the "Model Summary" output of the regression test show important statistics that describe how well the regression model used in explaining variations in the dependent variable (Test). The following is an explanation of the Model Summary table:

- The Model Summary table above provides information about the performance of the linear regression model used to predict the dependent variable (Trial) based on the

predictor variables (Application of Materials, Application of Concepts, Delivery, Documentation, Understanding of Concepts). The following is an explanation of each metric in the table:

- R: The correlation (R) value between the predicted and actual values of the dependent variable is 0.569. This indicates that there is a moderate positive correlation between the model predictions and the actual data.
- R Square (R^2): The R Square value of 0.324 indicates that about 32.4% of the variability in the dependent variable (Test) can be explained by the regression model using the five predictor variables. This gives an indication of how well the model can explain the variation in the data.
- Adjusted R Square: The Adjusted R Square value is 0.273. Adjusted R Square takes into account the number of predictor variables in the model and adjusts for the number of observations. An Adjusted R Square that is lower than the R Square indicates that some predictor variables may not contribute significantly to the model and this is a more conservative measure.
- Std. Error of the Estimate: The standard error of the estimate is 0.32272. It measures the average distance of the model prediction from the actual value of the dependent variable. A smaller value indicates that the model prediction is closer to the actual value.

Based on this table, it can be concluded that the linear regression model has a moderate correlation with the predicted values that can explain about 32.4% of the variability in the data. However, the lower Adjusted R Square value indicates that some of the predictor variables may not be very significant in explaining the variability in the data. The model also has a standard error of 0.32272, which gives an indication of the model's predictive accuracy.

Table 4. Anova[a] Result

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.292	5	.658	6.322	<,001[b]
	Residual	6.874	66	.104		
	Total	10.166	71			

Notes:

a. Dependent Variable: Trial
b. Predictors: (Constant), Application of Material, Application of Concept, Delivery, Documentation and Concept Understanding.

The results of the "ANOVA" output of the regression test provide information about the significance of the regression model as a whole. The following is an explanation of the statistics provided:

- The results from the ANOVA table show that the overall regression model is statistically significant (p-value < 0.001). This means that the independent variables (Application of Materials, Application of Concepts, Delivery, Documentation, Understanding of Concepts) together have a significant influence on the dependent variable "Trial".
- With an F-value of 6.322 and a p-value of 0.000, we can conclude that the regression model used can explain the variation in the trial results significantly better than if we did not use these predictor variables. This supports that the new curriculum does have a significant impact on the teaching and learning process in lecture classes.

Table 5. Coefficient[a]

Model	Unstandardized Coefficients	Standardized Coefficients

		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.179	.491		-.364	.717
	Concept Understanding	.082	.100	.096	.825	.413
	Application of Concept	.090	.114	.086	.792	.431
	Documentation	.226	.150	.171	1.508	.136
	Delivery	.272	.133	.236	2.052	.044
	Application of Materials	.344	.119	.314	2.882	.005

Notes: a. Dependent Variable: Trial

Explanation of the Coefficient table:

Based on the results of the regression analysis, the variables "Delivery" and "Application of Materials" have a significant impact on the value of "Trial". These two variables have statistically significant coefficients with p-value <0.05.

- Delivery: Has a significant effect with a coefficient of 0.272 (p = 0.044), indicating that the better the delivery of the material, the higher the trial results.
- Application of Materials: Has a significant effect with a coefficient of 0.344 (p = 0.005), indicating that the better the application of the material, the higher the trial results.

Other variables such as "Conceptual Understanding", "Conceptual Application", and "Documentation" did not show a significant influence on the "Trial" score. Overall, these results **show that the new curriculum can have a significant impact on the teaching and learning process, especially through improvements in the delivery and application of materials**.

Table 6. Residual Statistics[a]

	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	1.7558	2.7997	2.3861	.21534	72
Residual	-.65282	.76780	.00000	.31115	72
Std. Predicted Value	-2.927	1.921	.000	1.000	72
Std. Residual	-2.023	2.379	.000	.964	72

Notes: a. Dependent Variable: Trial

- Predicted value is the value predicted by the regression model for the dependent variable "Trial". The minimum value is 1.7558, the maximum value is 2.7997, with a mean of 2.3861 and a standard deviation of 0.21534.
- Residual is the difference between the observed value and the predicted value. The minimum residual value is -0.65282, the maximum value is 0.76780, with a mean of 0.00000 (which is expected as residuals should have a mean of zero), and a standard deviation of 0.31115.
- Std. Predicted Value is the predicted value that has been standardized (converted to a standard distribution with mean 0 and standard deviation 1). The minimum value is -2.927 and the maximum value is 1.921, with a mean of 0.000 and a standard deviation of 1.000.

- Std. Residuals are residuals that have been standardized. The minimum value is -2.023, the maximum value is 2.379, with a mean of 0.000 and a standard deviation of 0.964.

Based on point 3 for Data Finding and Pre-Processing Process, we have some interpretation, histogram, and normal P Plot for the result that concluded in this explanation below:

1. Interpretation
   A. Interpretation Points
   - Normality of Residuals: The mean of the residuals is 0 and the standard deviation of the residuals is quite small (0.31115) indicating that the regression model predicts fairly accurate values overall.
   - Distribution of Predicted Values: Predicted values spread over a relatively narrow range (1.7558 to 2.7997) indicate that the model provides consistent predictions.
   - Standardized Values: Both the standardized predicted values and standardized residuals show a normal distribution, with a mean close to 0 and a standard deviation close to 1. This indicates that the regression model works well in terms of residual distribution.
   - Outliers: There are no highly extreme residuals (outside the range of -3 to 3), indicating the absence of significant outliers in the model.

   B. Conclusion
   Based on the Residuals Statistics table, it can be concluded that the regression model used to evaluate the effect of the new curriculum on the teaching and learning process in the classroom performed well. The model predictions are accurate and the residuals are normally distributed, indicating that the assumptions of linear regression are met. This reinforces the finding that the implementation of the new curriculum had a significant and positive impact on the teaching and learning process.

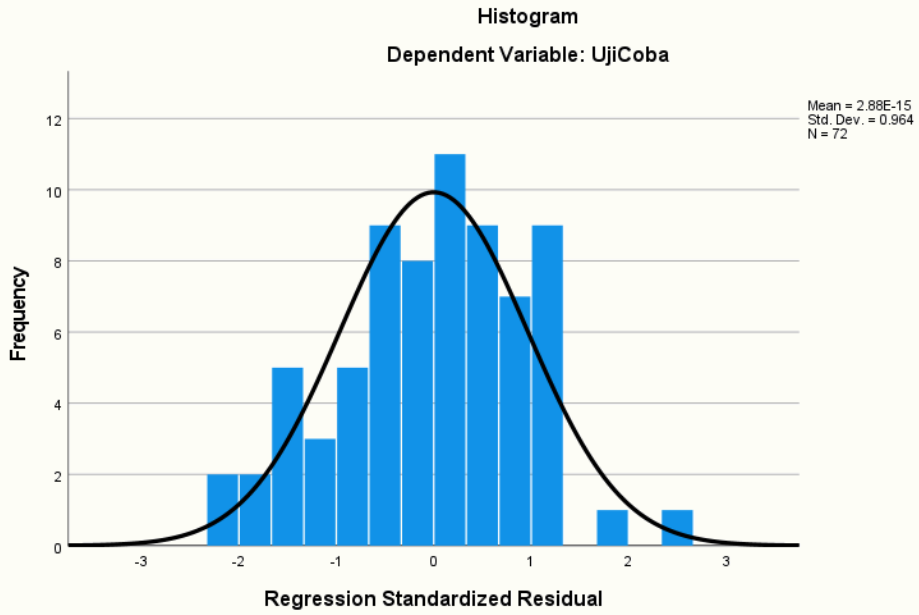

Figure 4. Regression Standardized Residual

2. Histogram

Histogram explanation based on Regression Standardized Residual figure above were:

   A. Basic Statistics
   - Mean: 2.88E-15 (2.88 x 10^-15)
     - A very small mean value, close to zero, indicates that the average residual (the difference between the observed value and the value predicted by the model) is very small. This indicates that the model has no systematic bias.
   - Standard Deviation (Std. Dev.): 0.964

- The standard deviation of the residuals is 0.964, which is close to 1, indicating that the residuals are spread around the predicted value with relatively little variation.

- N: 72
  - The number of data used in the analysis is 72.

B. Graph Interpretation

- X-axis Regression Standardized Residual
  - Residual values that have been standardized to have a mean of 0 and a standard deviation of 1.
- Y-axis: Frequency
  - The number of occurrences of each residual value range.
- Distribution:
  - The histogram shows that the residual distribution is close to a normal distribution, with most of the residuals around the mean (0).
  - The normal distribution curve (black line) shows that the residual distribution tends to be symmetrical with peaks around the mean and tails that decrease in the negative and positive directions.

C. Conclusion

- Normality of Residuals: The histogram shows that the residuals of the regression model are distributed close to normal. This is an important assumption in linear regression, as the normality of the residuals indicates that the model fits the data well and the resulting predictions are valid.
- Bias and Spread: A very small mean and a standard deviation close to 1 indicates that the model has no systematic bias and the residuals are reasonably distributed around the predicted values.

D. Key Conclusions

The regression model used to analyse the impact of the new curriculum on the teaching and learning process in lecture classes showed good results. The normal distribution of residuals and no systematic bias indicate that the model is suitable for the data used and can produce valid and reliable predictions. Overall, these results reinforce the conclusion that the implementation of the new curriculum has a significant impact on the teaching and learning process, with the variable "Application of Materials" showing a significant effect.

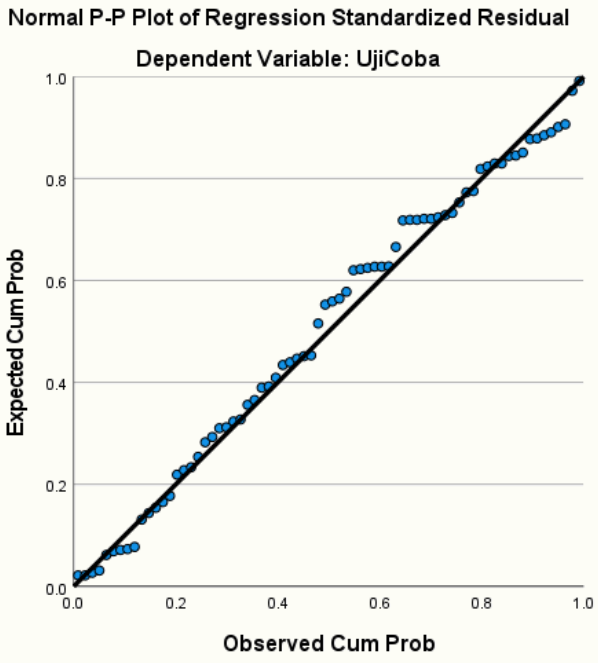

Figure 5. Normal P Plot of Regression Standardized Residual

3. Normal P Plot of Regression Standardized Residual

The following is an explanation of the P-P (Probability-Probability) plot for the standard regression residuals:

A. Plot Description

- X-axis (Observed Cum Prob): The observed cumulative probability for the standardized residuals.
- Y-axis (Expected Cum Prob): Cumulative probability expected if the residuals follow a standard normal distribution.

B. Plot Interpretation

- Black Diagonal Line: This line represents a perfectly normal distribution. If the regression residuals follow a normal distribution, the points will fall around this line.
- Blue Dots: These dots are the observed standardized residuals of the regression model. They are compared to the expected normal distribution.

C. Normality of Residuals

- Alignment with the Diagonal Line:
  - If the dots are mostly along the diagonal line, it indicates that the residuals follow a normal distribution.
  - In this plot, most of the points are around the diagonal line, indicating that the residuals are well distributed normally.
  - Some small deviations from the diagonal line are normal and acceptable in residual analysis.

D. Conclusion

- Normality of Residuals: The P-P plot shows that the residuals of the "Test Run" regression model are close to a normal distribution. This is a positive indication that the regression model meets one of the important assumptions of linear regression, which is residual normality.

  Model Validity: With good residual normality, we can have greater confidence that the regression model provides valid estimates and that the results of statistical inference, such as hypothesis testing and confidence intervals, are reliable.

CONCLUSIONS

Based on the regression test results, residual histograms and P-P plots, we can conclude that the regression model applied to evaluate the impact of the new curriculum on the classroom teaching and learning process is valid and reliable. The near-normal distribution of residuals corroborates the validity of the model and supports the finding that the implementation of the new curriculum had a significant impact on the teaching and learning process. Conclude the answer to the question based on this research were: (1) Do current students understand the concept of Agile? Based on the descriptive statistics above, we can conclude that current students have a moderate or medium understanding of Agile concepts. The average score being around the middle of the scale indicates that there is room for improvement in the understanding of Agile concepts among students. The variation in understanding also indicates the need for more effective teaching approaches to ensure that all students reach a higher level of understanding; (2) How to determine the level of creativity of students towards the current teaching and learning process? Based on the significant correlation, we can conclude that there is an indication that students' creativity in the teaching and learning process is reflected in the relationship between concept application, documentation, and delivery. Students who are creative in applying concepts and documenting their work tend to have better delivery skills; and (3)Does the new curriculum have a significant impact on the teaching and learning process in lecture classes? From the results of the linear regression test, it can be concluded that the new curriculum has a significant impact on the teaching and

learning process, as seen from the R Square value which shows that the model can explain about 32.4% of the variability in the teaching and learning process. The moderate correlation (R) value also indicates a fairly strong relationship between the new curriculum and the teaching and learning process. However, the lower Adjusted R Square value indicates that there is room for improvement in the model, perhaps by adding other relevant predictor variables or by improving the measurement of existing variables.

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