
Estimation of the Relationship Between Learning Styles Inventory and Online Learning During the Pandemic

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Abstract

The learning model during the Covid-19 pandemic underwent a change in the teaching process. Where the changes are seen in the learning process, where face-to-face in the classroom turns into virtual online learning. This study will measure the extent of the relationship between student grades and their learning styles during the pandemic. The data that will be used are data from the questionnaire results of the Computer Faculty students from the University in Jakarta. This questionnaire was conducted on August 30, 2020. After the questionnaire dataset was fulfilled, it was integrated with student scores for those who took the questionnaire. To determine the learning style using David Kolb's Learning Style Inventory. While the statistical test uses Anova One Way and Post hoc. The results of data analysis will produce the learning style of each student. The results of data analysis will also recommend four roles for the teaching style of the teacher using the Kolb Educator Role Profile (KERP).

Keywords: estimation of KLSI, KLSI during Pandemic, role KERP after KLSI.

I. INTRODUCTION

There are many efforts and ways made by the government of Indonesia and other countries to continue to improve the quality of education so that students can continue to carry out their learning activities even though they are currently in a pandemic. Therefore, we conducted research on the influence of the relationship between learning style investment or the Learning Style Inventory (LSI) and the value of students who took teaching using virtual online during this pandemic. While LSI itself has several trends in category types, but in this study we will use the tendency of the types of categories used by David Kolb, which include diverging, assimilating, converging and accommodating [1]. As shown in **Figure 1 Kolb's Experiential Learning Style Inventory**.

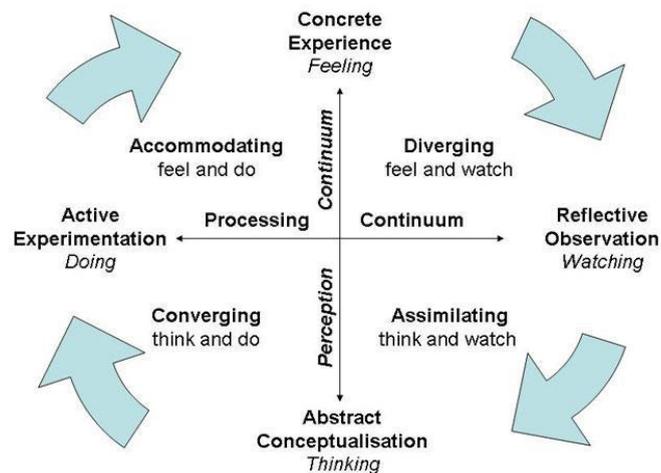


Figure 1. Experiential Learning Style Inventory David Kolb's.

Previously, this research will make a web-based Learning Style Inventory questionnaire application as a place to facilitate the questionnaire data input form which will be filled in by students (Respondents). The website can be visited at <http://quisionerano.com/>. The population of students that will be studied is students in the Information Engineering study program at the Mohammad Husni Thamrin University in Jakarta. The results of the data from the questionnaire will determine the trends of the four types of LSI Kolb [2]. After the data from the questionnaire has been collected, the data will be statistically tested using the Anova and Post Hoc models [3], which will later see if there is a correlation between student achievement scores and the learning styles of each respondent. In addition, the results of this dataset can

create knowledge patterns for teachers or lecturers in choosing what teaching styles are appropriate in the future.

To follow the learning styles of students whose learning styles have been identified, David Kolb said there are four roles of teachers or lecturers in teaching or it can be called four teaching styles [4], namely the Kolb Educator Role Profile (KERP) model where four of them is; Facilitator Role, Expert Role, Evaluator Role and Coach Role which can be seen in

Figure 2. Kolb Educator Role Profile.

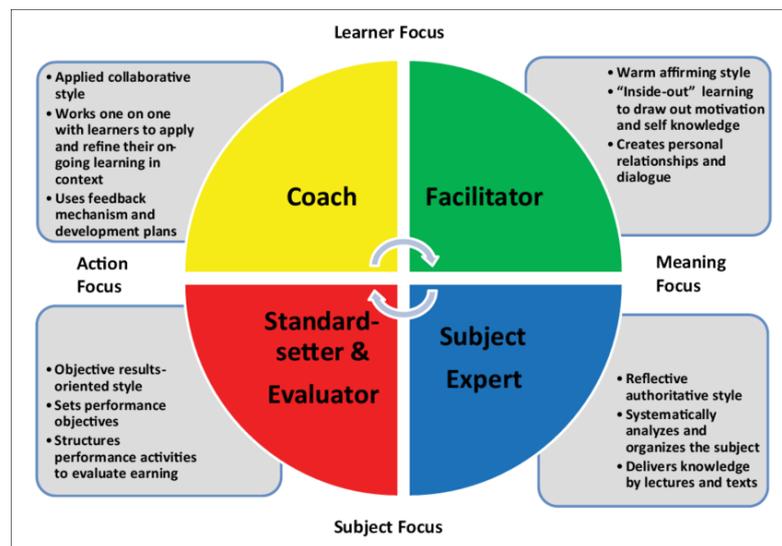


Figure 2. Kolb Educator Role Profile.

II.METHODS

This research is a quantitative analytic study, the dataset obtained from the output dataset of the LSI questionnaire website (<http://quisionerano.com/>). Variable Y (Dependent Variable) in this study is LSI while variable X (Independent Variable) is Nilai_Prestasi (Achievement Value). This study involved 60 students who responded to the questionnaire and the output would be classified into four types of learning styles (LSI), namely; diverging, assimilating, converging and accomodating. After the dataset is classified, it will then be integrated with Achievement Value. The data in **Table 1. Data LSI** shows an example of the output data record integrated with the learning achievement scores.

Tabel 1. Data LSI

Nilai Prestasi	LSI
3	4
3.94	1
3.9	1
1.05	3
3.77	3
3.09	3

This study consists of several stages of research as shown in **Figure 3. Research Stages**, namely: 1) Problem Identification; 2) Problem Formulation; 3) Data Collection; 4) System Development Design; 5) Testing and Implementation; 6) Data Analysis; 7) Conclusion of Results. Of the seven stages, the data analysis stage is the most decisive thing in this study, where at this stage data analysis techniques are carried out in seeing the correlation value of LSI with Achievement Value. In stage 6, the data analysis consisted of descriptive analysis and difference analysis. Descriptive analysis uses mean and percentage values in each learning style group. While the analysis of differences was carried out using the one way Anova statistical test with a significance limit of 5% or 0.05.

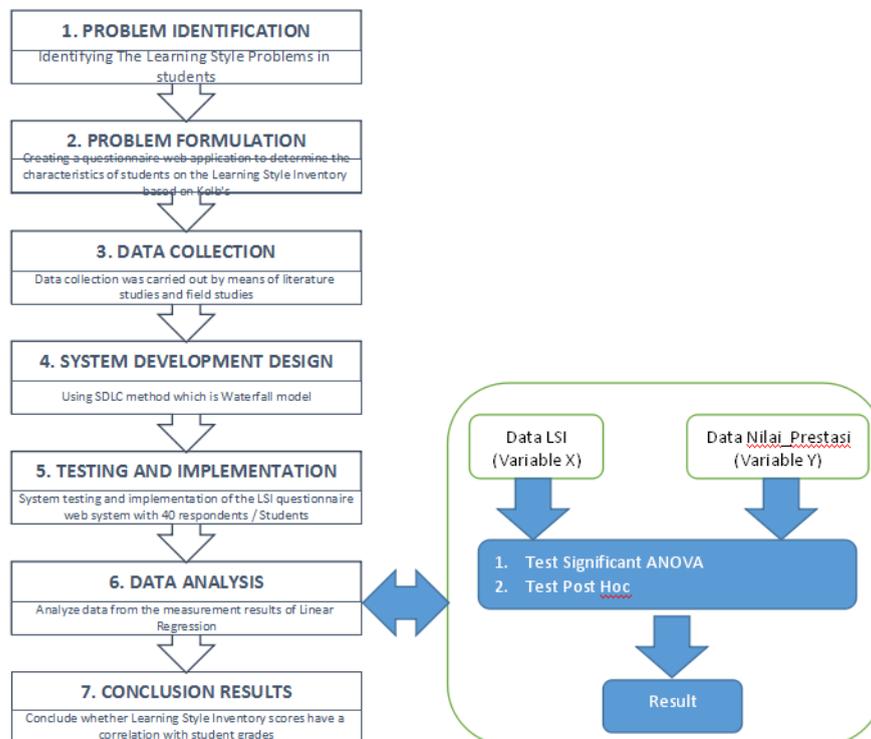


Figure 3. Research Stages.

III. RESULTS AND FINDINGS

3.1 Results

The results of the descriptive study are shown in Table 2. Description of the LSI and the Mean Learning Achievement Value, from a total of 60 respondents, it was found that 3 respondents had an accommodator learning style with a mean value of learning achievement results of 2.87, as many as 20 people had an assimilating learning style with a mean value of learning achievement. 3.47. For the converging learning style, there were 31 people with a mean value of learning achievement of 3.26, while for the diverging learning style there were 6 people with a mean value of learning achievement of 3.89. From these results, it can be seen that the lowest value for respondents who have the Accomodator learning style is 2.87, while the highest value is owned by respondents who have a Diverging learning style is 3.89.

Tabel 2. Description LSI and the Mean Learning Achievement Value

Nama LSI	Jumlah	Nilai rata-rata
Accommodator	3	2,8767
Assimilating	20	3,4715
Converging	31	3,2623
Diverging	6	3,8933

In **Figure 3. The Learning Style Grouping Diagram Based on the Number of Respondents**, shows the learning style grouping based on the number of respondents. There are 5% who have the Accommodating learning style, then 33% are in Assimilating, 52% of respondents who have Converging learning styles and 10% for respondents who have Diverging learning styles. Thus it can be seen that the most learning styles owned by respondents are Converging as much as 52%.

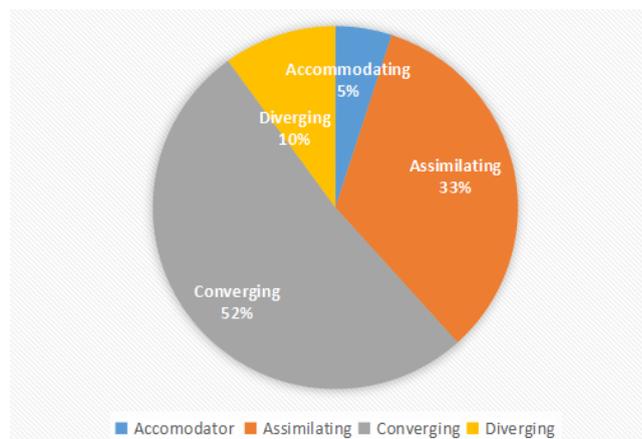


Figure 3. The Learning Style Grouping Diagram Based on the Number of Respondents

In Figure 4. The Learning Style Grouping Diagram Based on Student Achievement Value, shows that the learning style grouping is based on the average value of learning achievement of the respondents. The results show that the percentage of learning styles is almost the same in the four learning styles. There are 22% who have the Accomodator learning style, then 24% are in Assimilating, 25% of the respondents who have the Converging learning style and 29% of the respondents who have the Diverging learning style. So the highest average value is in the Diverging learning style and the lowest value is in the Accomodator learning style.

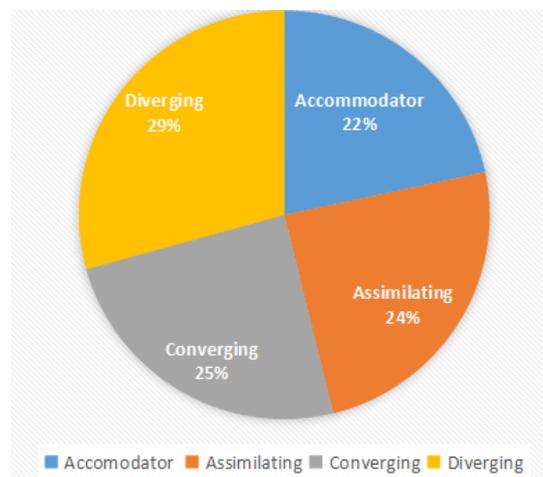


Figure 4. The Learning Style Grouping Diagram Based on Student Achievement Value

In Table 3. ANOVA, the ANOVA explains that the test results using the One Way ANOVA test show that there are differences in learning achievement values in the four LSI groups with a P value of 0.014, where P value <0.05. Followed by testing the Post Hoc, in Table 4. Post Hoc, explaining that the results of the post hoc test show that the significantly different learning style groups are Diverging with Converging with a significant value of 0.04 and Diverging with Accomodator with a significant value of 0.03.

Table 3. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2,937	3	,979	3,871	,014
Within Groups	14,165	56	,253		
Total	17,102	59			

Table 4. Post Hoc

(I) LSI	(J) LSI	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound
Diverging	Assimilating	,42183	,23410	,462	-,2185
	Converging	,63108 [*]	,22431	,041	,0175
	Accomodator	1,01667 [*]	,35563	,036	,0439
Assimilating	Diverging	-,42183	,23410	,462	-1,0622
	Converging	,20924	,14424	,915	-,1853
	Accomodator	,59483	,31139	,367	-,2569
Converging	Diverging	-,63108 [*]	,22431	,041	-1,2446
	Assimilating	-,20924	,14424	,915	-,6038
	Accomodator	,38559	,30409	1,000	-,4462
Accomodator	Diverging	-1,01667 [*]	,35563	,036	-1,9894
	Assimilating	-,59483	,31139	,367	-1,4465
	Converging	-,38559	,30409	1,000	-1,2174

3.2 Findings

In this case, we use the KLSI model in determining the Learning Style of the students of the Mohammad Husni Thamrin University Jakarta, it can be seen that the learning style tendency of each student (Respondent) can be seen. It is important to know the learning styles of students so that the lecturers know how to take teaching methods. By using the four roles of Teaching Style from Kolb's Educator Role Profile (KERP) model, the lecturer can see the role of teaching styles that are tailored to the learning styles of students. In **Figure 3. The Learning Style Grouping Diagram based on the number of respondents**, shows that the largest number is Converging, namely 52%, so to improve the most students can use the role of the Evaluator in teaching, namely by evaluating the results of students with objective results oriented in order to fulfill the the necessary requirements for quality results.

In another article, research on the online learning experience of a group of ESL students at a higher education institution in Oman. This research was conducted at the time of Covid-19 [5]. This study measures the interaction between students' preferred online learning styles and the technology applications used by students on the e-learning platform. The results of this study indicate that most of the learning styles that students like can be seen

from the technology they use when online classes take place. The results of the questionnaire show that the most convergent learning styles (53.1%), while the least learning styles are Diverging (6.3%). The Chi-Square test shows p-value = 0.021 (≤ 0.05) which indicates a relationship between disciplines and learning styles so that it rejects the null hypothesis. The value of $r = 0.780$ indicates a correlation between student disciplines and their learning styles.

Research conducted at the EFL University in Tehran [6]. This study measures the relationship between Kolb's learning styles and American slang learning in Iranian EFL students with a focus on gender. Respondents were 63 respondents consisting of 27 men and 36 women. The results showed the highest correlation value between Kolb's learning style and American slang learning, namely Concrete Experience (CE) with a value of = 868 and the lowest was Abstract Conceptualization (AC) = 645 and the value of P value = 0.001. Meanwhile, the highest correlation between Kolb's learning style and gender is Concrete Experience (CE) = 0.093 and the lowest is (AE) = 0.003.

This research was conducted in schools in Iranian countries [7], this study examines the relationship between learning styles such as subjective experience, abstract concepts, active experimental, reflective observation with creativity. The number of respondents amounted to 354 students in which 164 male respondents and 190 female respondents. This study shows the results that there is a significant relationship between learning styles and creativity. The results of regression analysis in this study show the variables creativity = 1, Abstract style = 0.637, Light reflection = 0.643, Lightweight concrete experience = 0.685 and Active experimentation Style = 0.69, all of which are not significantly different (<0.05). Where it can be concluded that the results of the linear regression indicate a relationship between relective style and creativity.

This research was conducted in 2012 [3] at the University of Cincinnati's Department of Surgery, Ohio. At the time the Accreditation Council at Graduate Medical Education imposed 80 hours of work per week for the residency program from 2003 to 2012. Statistical analysis was carried out using the chi-squared model, logistic regression and Wilcoxon rank-sum test and was followed by 411 respondents. This research was conducted for 14 years. With male respondents by 89% and women 11%. There was no significant difference between the groups in terms of race or experience. However, there was a significant increase in the number of women after 2003, namely $P < 0.001$.

IV. CONCLUSIONS

In determining how to teach for a teacher or lecturer, first look at the learning style of each student or student. In this study, it shows that the majority of learning styles in students are found to be converging learning styles, so the appropriate teaching role based on the four roles of KERP is Evaluator Role. However, to increase the value of students with the lowest mean score in this study, it was found in the Accomodator learning style, the teacher or lecturer could use the Coach Role Teaching Style. Based on the results of the analysis, the teaching style of lecturers at Mohammad Husni Thamrin University at the time of the pandemic tended to use the Facilitator Role and Expert Role which had an impact on the diverging and assimilator learning styles which found the highest average value.

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