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The Effectiveness of Virtual Learning in a Transformational Leadership Perspective

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ABSTRACT

The purpose of this study was to analyze the effect of Virtual Transformational Leadership and Student Creativity on the Effectiveness of Virtual Learning in several universities throughout the city of Bandung. Using surveys and a quantitative approach, the study was conducted on 100 students and 100 lecturers in the city of Bandung. Data were analyzed descriptively and the PLS Structural Equation Model (Garson 2018). The results of the study found that Virtual Transformational Leadership had a positive influence on the Effectiveness of Virtual Learning in several universities throughout the city of Bandung. Thus, the transformational leadership style approach used by lecturers is enough to encourage an increase in the effectiveness of virtual learning that is carried out. This research is expected to have an impact on the implementation of learning in all educational units which are transferred to virtual learning to become effective and efficient learning implementation amidst the limitations of existing infrastructure.

Keywords: Transformational Leadership, Virtual Learning Effectiveness.

INTRODUCTION

The Covid-19 pandemic in Indonesia has made the learning system change drastically from face-to-face learning to virtual learning at home. The implementation of learning in all educational units is diverted into virtual or blended (semi-virtual) learning. Implementation of virtual learning is a solution to learning problems (Adnan 2020; Dhawan 2020; Kauffman 2015) As a result of the Covid19 pandemic that hit Indonesia, many campuses that were not used to conducting virtual lectures were forced to change the face-to-face system to virtual lectures amid limited infrastructure. there is. This causes the learning to be less effective, students find it more difficult to understand the material provided by the lecturer, the lack of interaction between lecturers and students, makes it difficult for them to understand the material provided. It is more difficult for students to ask about material they do not understand and lack of student concentration when learning is done virtually (Limbong and Simarmata 2020). The problem of the effectiveness of this learning needs to get attention because during virtual learning many problems were found so that the learning process became ineffective. However, some previous findings about the effectiveness of virtual learning state that virtual learning is more effective than face-to-face meetings (Means et al. 2013) Bernard, 2015; (Djusar, Sadar, and Asril 2021; Hikmat et al. 2020).

Learning effectiveness is a measure of the success of a process of interaction between students and between students and teachers in educative situations to achieve learning goals (Rohmawati 2015). The effectiveness of learning can be seen from the activities of students during learning, student responses to learning and students' mastery of concepts. The characteristics of the effectiveness of learning programs are successful in delivering students to achieve predetermined instructional goals, providing attractive learning experiences, actively involving students so as to support the achievement of instructional goals, and having facilities that support the teaching and learning process (Rohmawati 2015). John Carroll states that Instructional Effectiveness depends on five factors: 1) Attitude; 2) Ability to Understand Instruction; 3) Perseverance; 4) Opportunities; 5) Quality of Instruction (Supardi, 2013). Knowing some of these indicators shows that learning can run effectively if there is an attitude and willingness in the child to learn, the self-readiness of students and teachers in learning activities, and the quality of the material presented. The virtual learning process is said to be effective if the learning can achieve the expected goals and students can absorb the subject matter and put it into practice (Hadijah et al. 2021). Indicators that can measure the effectiveness of learning are 1) the quality of learning, namely how much information is given to students so that it can be easily learned, 2) the suitability of the level of learning, namely the extent to which students are prepared to receive material from lecturers, 3) intensive, namely how much effort lecturers motivate students, and 4) time, namely how long a student can complete learning activities. The effectiveness of learning can be seen from the intensity of students following and understanding the lecture material being carried out, in accordance with the availability of existing online learning time, the ability of students to communicate well with lecturers by utilizing online learning applications, lecturers always respond quickly to questions/communications given by students, students do not feel difficulties related to interactions with lecturers in online learning so that they can interact with lecturers broadly without being limited by time and without being limited by class schedules, and learning content (Hadijah et al. 2021).

On the other hand, the transformational leadership approach can increase virtual learning to be effective. Transformational leadership is a process or approach that transforms and transforms individuals. (Bass 1997) states that transformational leadership occurs when one or more people engage with others in such a way that leaders and followers elevate each other to higher levels of motivation, performance, and morality. Therefore, transformational leadership emphasizes the importance of psychological aspects of human communication including emotions, values, ethics, and long-term goals. Throughout transformational leadership, followers or students are treated as human beings by evaluating their motivations and fulfilling their needs (P. G. Northouse, 2013). Transformational leaders in academic settings are not limited to knowledge transitions, but rather play an important role in skills development. They are skilled role models who are anticipated to catalyze student curiosity and cater to student needs and inclinations. (Bass 1997) stated that such behavior is considered a type of transformational leadership. Embracing transformational leadership by virtual learners can influence student satisfaction in a number of ways, such as increasing opportunities for students to freely ask questions, increasing opportunities where virtual learning inspires students to achieve higher expectations, and addressing student concerns. which makes students feel more relieved.

Transformational leadership is the ability possessed by a leader to influence his subordinates, so that they will trust, imitate, and respect him (Bass 1997). Transformational

leadership is a condition in which the followers of the transformational leader feel that there is trust, admiration, loyalty and respect for the leader, and they are motivated to do more than what they expect. Transformational leaders are leaders who inspire their followers to put aside their personal interests for the good of the organization and are able to have an extraordinary influence on their followers (Suweko and Dwiantoro 2020). Transformational leadership is a leadership style used by a manager when he wants a group to expand its boundaries and have performance beyond the status quo of the organization to achieve a whole new set of organizational goals (Pradana 2017). A transformational leader is always looking for the possible motives of his followers, to draw their attention to higher demands and turn individual interests into collective interests (Korejan and and H. Shahbazi 2016) Transformational leadership allows companies to withstand turbulent times that can disrupt the organization because their leaders cultivate a sense of courage and don't give up attitude during difficult times that organizations sometimes face, transformational leadership style can help companies to give them a competitive advantage over their competitors in this tough business world where companies are fighting for their survival.

Transformational leadership helps companies to interact with a turbulent environment by stimulating their followers to come up with the best solutions to problems. Through transformational leadership, guidance is provided to followers towards a vision and helps exchange between followers and leaders (Bass 1997). The main difference between transformational leadership and other leadership styles is the respect and appreciation shown for accomplishments and the support shown to them by followers to achieve higher performance. Transformational leadership is given more attention because it leads to better performance (Munir et al. 2012). A leader's transformational competence can be measured by his ability to build synergy for all his subordinates by utilizing their influence and authority so that they are more successful in achieving the vision and mission of the organization. The change process carried out by transformational leaders, according to (Bass 1997), can be carried out in the following ways: (a) increasing subordinates' awareness of the value and importance of tasks and work; (b) direct them to focus on group and organizational goals, not on personal interests; and (c) develop their potential to the fullest. The implementation of transformational leadership is not only appropriate in a bureaucratic environment, but also in various organizations that have a lot of potential and educated staff (Noviyanti et al. 2020).

Learning effectiveness is a measure of the success of a process of interaction between students and between students and teachers in educative situations to achieve learning objectives. The effectiveness of learning can be seen from the activities of students during learning, student responses to learning and students' mastery of concepts. To achieve an effective and efficient learning concept, there needs to be a reciprocal relationship between students and teachers to achieve a goal together, besides that it must also be adapted to the conditions of the school environment, facilities and infrastructure, and learning media needed to help achieve all aspects of development. -student development (Rohmawati 2015). (Carroll and Spearritt 1967) who is well known in the field of educational psychology, and in his book entitled "A Model of School Learning", states that Instructional Effectiveness depends on five factors: 1) Attitude; 2) Ability to Understand Instruction; 3) Perseverance; 4) Opportunities; 5) Quality of Instruction. Knowing some of these indicators shows that learning can run effectively if there is an attitude and willingness in the child to learn, the self-readiness of students and teachers in learning activities, and the quality of the material presented. If the five indicators are not present, the teaching and learning activities of students will not run well. Effective learning activities are needed by students to help develop students' thinking power without compromising the level of

understanding of students according to the age of their development. Learning effectiveness is a measure of the success of the interaction process in educative situations to achieve learning objectives. Judging from the activities during learning, response and mastery of the concept.

Currently, it has entered five semesters of using applications in virtual learning. The virtual learning process is said to be effective if the learning can achieve the expected goals and students can absorb the subject matter and practice it. Indicators that can measure the effectiveness of learning are 1) the quality of learning, namely how much information is given to students so that it can be easily learned, 2) the suitability of the level of learning, namely the extent to which students are prepared to receive material from lecturers, 3) intensive, namely how much effort lecturers motivate students, and 4) time, namely how long a student can complete learning activities.

The effectiveness of learning can be seen from the intensity of students following and understanding the lecture material being carried out, in accordance with the availability of existing online learning time, the ability of students to communicate well with lecturers by utilizing online learning applications, lecturers always respond quickly to questions/communications given by students, students do not feel difficulties related to interactions with lecturers in online learning so that they can interact with lecturers broadly without being limited by time and without being limited by lecture schedules and learning content.

METHOD

This study uses a quantitative approach by utilizing a questionnaire as the main instrument for data collection. Data were analyzed by deceptive analysis to describe the various characteristics of the variables studied. Verification analysis for testing the research hypothesis is Structural Equation Modeling Partial Least Square (SEM-PLS). This research was conducted on lecturers and students from tertiary institutions (public/private) in the city of Bandung with a representative sample of 100 each taken by proportional random sampling.

In this study, each operational variable is translated into concepts, dimensions, indicators, and measurement scales according to the variables to be measured. The variables used in this study consisted of one endogenous latent variable, namely the Effectiveness of Virtual Learning (Y) and one exogenous latent variable, namely Transformational Leadership (X). Transformational leadership variables (X) include dimensions of ideal influence, inspirational motivation, intellectual stimulation and individual consideration, and 12 indicators. Virtual Learning Effectiveness (Y) includes the dimensions of Attitude, Ability to Understand Instruction, Perseverance, Opportunity, Quality of Instruction, and 10 indicators.

The model framework for the influence of transformational leadership on the effectiveness of virtual learning is built on one hypothesis, namely that Virtual Transformational Leadership has a positive effect on the Effectiveness of Virtual Learning in Universities throughout the City of Bandung during the COVID-19 pandemic. t-test is used to test the significance to reject or accept the hypothesis.

RESULT AND DISCUSION

Instrument Validity and Reliability

Assessment of the validity of each questionnaire statement item uses the correlation value of the item score with the total variable score. The validity index is calculated using the product moment correlation. Statement items are declared valid if the correlation coefficient is 0.30. The results of the validity test show that all items in each research variable have an rcount value greater than 0.3 so it can be concluded that the items are valid. The measuring tool in the form of a questionnaire statement has a good level of validity, which means it can measure the variables studied.

The calculation of the reliability value of the research questionnaire uses the Cronbach alpha formula which is calculated using the SPSS program. The minimum value is declared reliable if the Cronbach's Alpha coefficient is greater than 0.7. The Cronbach's Alpha value for the reliability of the research variable questionnaire was obtained greater than the critical value of 0.7. The results of this reliability indicate that all the statement items used are reliable so that it can be concluded that the measuring instrument used to measure the Virtual Transformational Leadership variable and the Virtual Learning Effectiveness variable has provided consistent results.

Descriptive Analysis

Score interpretation criteria based on the results of answers from respondents can be used based on the maximum score for each questionnaire is 5 and the minimum score is 1, or ranging between 20% - 100% so that the distance between adjacent scores is 16% ((100% -20%) / 5)). The following are the criteria obtained from the interpretation of the scores based on the results of the respondents' answers in Table 1:

Table 1.
Score Interpretation

Results	Categories
20% - 35,99%	Very low
36% - 51,99%	Low
52% - 67,99%	Moderate
68% - 83,99%	High
84% - 100%	Very High

Sumber: Sugiyono (2010:133)

Interpretation of the score is obtained by comparing the item scores obtained from the answers given by the respondents with the highest score of the answer multiplied by 100%.

$$\frac{Item\ Score}{Highest\ score} x\ 100\%$$

The item score results are obtained from the question scale value multiplied by the number of respondents who answered. While the highest score is obtained from the

multiplication of the highest number of question scale values with the total number of respondents.

Virtual Transformational Leadership Variables

Recapitulation of the distribution of respondents' responses about virtual transformational leadership is illustrated in Table 2 below:

Table 2

Recapitulation of Respondents' Response Distribution regarding Virtual Transformational Leadership

No	Statement Items	Alternative Answers					Total Score	Ideal Score	%Total Score	Category
		5 (SS)	4 (S)	3 (N)	2 (TS)	1 (STS)				
	Ideal Influence									
1	Explain the direction of the course at the beginning of the lecture	0	70	26	4	0	366	500	73.2%	High
2	Creates a sense of pride in taking this course	0	65	31	4	0	361	500	72.2%	High
3	Gain the trust of students	0	68	26	6	0	362	500	72.4%	High
	Total Indicators						**1089**	**1500**	**72.6%**	High
	Inspirational Motivation									
4	Communicating high expectations	0	74	20	6	0	368	500	73.6%	High
5	Explain the course objectives in an interesting way	0	71	25	4	0	367	500	73.4%	High
6	Focus on students	0	66	21	13	0	353	500	70.6%	High
	Total Indicators						**1088**	**1500**	**72.5%**	High
	Intellectual Stimulation									
7	Increase intelligence	0	59	32	8	1	349	500	69.8%	High
8	Brings out creativity	0	59	34	6	1	351	500	70.2%	High
9	Increase rationality	46	11	38	5	0	398	500	79.6%	High
	Total Indicators						**1098**	**1500**	**73.2%**	High
	Individual Considerations									
10	Gives personal attention/ encouragement	44	10	35	11	0	387	500	77.4%	High

11	Treat students as individuals	0	58	35	7	0	351	500	70.2%	High
12	Provide coaching	42	8	43	7	0	385	500	77.0%	High
	Total Indicators						**1123**	**1500**	**74.9%**	High
	Total						**4398**	**6000**	**73.3%**	High

Virtual Learning Effectiveness Variables

Recapitulation of the distribution of respondents' responses regarding the effectiveness of virtual learning is presented in Table 3 below:

Table 3
Recapitulation of the Distribution of Respondents' Responses regarding the Effectiveness of Virtual Learning

No	Statement Items	Alternative Answers					Total Score	Ideal Score	% Total Score	Category
		5 (SS)	4 (S)	3 (N)	2 (TS)	1 (STS)				
	Attitude									
1	Students have an attitude of responsibility for their expertise	11	73	16	0	0	395	500	79.0%	High
2	Students are able to internalize the spirit of independence	22	46	32	0	0	390	500	78.0%	High
	Total Indicators						**785**	**1000**	**78.5%**	High
	Ability to understand									
3	Students have the ability to understand the concepts/theories being taught	20	78	2	0	0	418	500	83.6%	High
4	Students have the ability to understand the situation in the field with the right concept/theory approach	28	11	52	9	0	358	500	71.6%	High
	Total Indikator						**776**	**1000**	**77.6%**	High
	Perseverance									
5	Students diligently do routine assignments	0	27	63	10	0	317	500	63.4%	Middle
6	Students are motivated to do heavy assignments	27	32	18	23	0	363	500	72.6%	High
	Total Indicators						**680**	**1000**	**68.0%**	High
	Opportunity									
7	Students spend a lot of time preparing for further studies	27	49	16	8	0	395	500	79.0%	High
8	Students have clear and achievable goals.	26	2	72	0	0	354	500	70.8%	High
	Total Indikator						**749**	**1000**	**74.9%**	High
	Quality of instruction									

9	Students are able to add or detail the details of an idea so that it becomes more interesting	10	77	13	0	0	397	500	79.4%	High
10	Students are interested in cases in the field that require critical thinking solutions	19	78	3	0	0	416	500	83.2%	High
	Total Indikator						**813**	**1000**	**81.3%**	High
	Total						3803	5000	**76.1%**	High

Discussion of Influence Analysis

In this study the authors used Structural Equation Modeling (SEM) with the Partial Least Square (PLS) approach to answer research problems. The research model was formed from 2 latent variables consisting of one exogenous variable (independent variable), namely Virtual Transformational Leadership and one endogenous variable (dependent variable), namely Virtual Learning Effectiveness. The SEM-PLS equation model in this study uses the Second Order approach.

Influence Model Results

The hypothesized full model calculation results obtained with Smart PLS 3.3.3 rocks are presented in Figure 1 as follows:

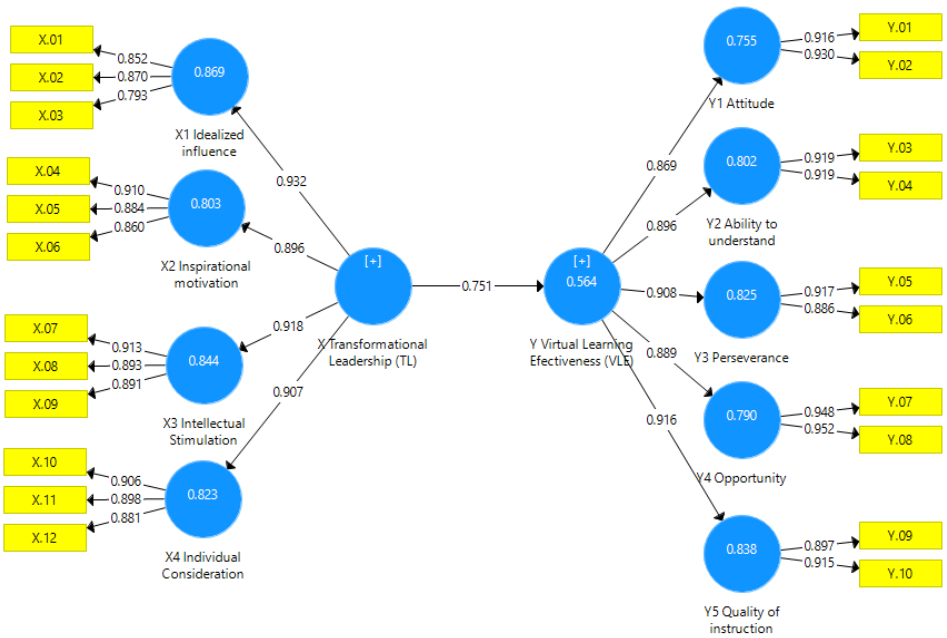

Figure 1

Path diagram of the Partial Least Square (PLS) SEM model approach

The calculation results show that the influence of Virtual Transformational Leadership on the Effectiveness of Virtual Learning is shown by the path coefficient value of 0.751. The R-square value for the Virtual Learning Effectiveness variable is 0.564, so the term model error is 1-0.564 = 0.436. The structural equation model for the influence of Virtual Transformational Leadership on the Effectiveness of Virtual Learning is as follows:

$$\eta = 0{,}751\xi + 0{,}436$$

Assessment of the SEM-PLS Model

To assess the suitability of the Structural Equation Modeling (SEM) model with the Partial Least Square (PLS) approach, there are 2 stages of assessment (Ghozali, 2011), namely evaluating the results of the measurement model (Outer model) and evaluating the results of the structural model (inner model).

The following will explain the results of the assessment for the research model used. The SEM-PLS model approach used is the second order model. The first order (first order) shows the relationship between items and indicators and the second order (second order) explains the relationship between indicators and variables.

Measurement Model Testing (outer model/measurement models)

The measurement model for each latent variable used in this study is reflective. According to Hair (2017) there are three criteria used in assessing Reflective outer models/ Reflective measurement models, namely 1). Internal consistency Reliability, 2). Convergent Validity and 3). Discriminant validity.

Internal consistency Reliability

To assess Internal consistency Reliability in the measurement model, there are two measures used, namely Cronbach's alpha and Composite reliability. Based on the results of data processing using the SmartPLS 3.3.3 software, the Internal Consistency Reliability test results for the two latent variables Transformational Virtual Leadership variables for the first order and second order were obtained as presented in Table 4 below.

Table 4

Internal Consistency Reliability Assessment Results

Variabel Laten	Indikator	Composite Reliability	Cronbach's Alpha
X Transformational Leadership (TL)		**0,956**	**0,950**
	X1 Idealized influence	0,877	0,789
	X2 Inspirational motivation	0,915	0,861

	X3 Intellectual Stimulation	0,927	0,881
	X4 Individual Consideration	0,924	0,876
Y Virtual Learning Efectiveness (VLE)		**0,954**	**0,947**
	Y1 Attitude	0,920	0,826
	Y2 Ability to understand	0,915	0,815
	Y3 Perseverance	0,897	0,771
	Y4 Opportunity	0,949	0,892
	Y5 Quality of instruction	0,902	0,783

Source: SmartPLS 3.3 Outputs

The construct indicators for both latent variables (Virtual Transformational Leadership and Virtual Learning Effectiveness) have a Composite reliability value of greater than 0.7. The results of calculating the Composite reliability (CR) value for Virtual Transformational Leadership (ξ_1) is 0.956 and the Composite reliability (CR) value for Virtual Learning Effectiveness (η) is 0.954.

The composite reliability value of the two latent variables has met the recommended assessment criteria, namely a CR of more than 0.7. The latent variables formed already have high consistency.

For Internal consistency Reliability assessment by looking at Cronbach's alpha value, obtained for Transformational Virtual Leadership (ξ) Cronbach's alpha value is 0.950 and for Virtual Learning Effectiveness (η) is obtained at 0.947. The two latent variables used in the research model have Cronbach's alpha values above 0.70 as the recommended criteria. So it can be concluded that the latent variable measurement model in the research model used has good internal consistency reliability.

Convergent Validity

To assess Convergent Validity in the SEM-PLS model, there are two measures, namely Indicator Reliability and Average Variance Extracted (AVE). Based on the results of data processing using the SmartPLS 3.3.3 software, the test results for each indicator were obtained as presented in Table 5 below.

Table 5
Convergent Validity Assessment Results
Virtual Transformational Leadership Variables

Indicator	**Loading Factor (λ)**	**Indicator Reliability (λ^2)**	**t_{count}**	**P value**	**Information**	**AVE**
X1 Idealized influence						**0,704**
X.01 <- X1	0.852	0.727	31.158	0.000	Valid	
X.02 <- X1	0.870	0.756	24.674	0.000	Valid	

X.03 <- X1	0.793	0.629	15.670	0.000	Valid	
X2 Inspirational motivation						**0,783**
X.04 <- X2	0.910	0.827	35.189	0.000	Valid	
X.05<- X2	0.884	0.782	26.218	0.000	Valid	
X.06<- X2	0.860	0.739	24.161	0.000	Valid	
X3 Intellectual Stimulation						**0,808**
X.07<- X3	0.913	0.833	39.487	0.000	Valid	
X.08<- X3	0.893	0.797	31.199	0.000	Valid	
X.09<- X3	0.891	0.794	43.849	0.000	Valid	
X4 Individual Consideration						**0,802**
X.10<- X4	0.906	0.822	43.009	0.000	Valid	
X.11<- X4	0.898	0.807	33.060	0.000	Valid	
X.12<- X4	0.881	0.777	30.445	0.000	Valid	
X (TL) -> X1 Idealized influence	0.932	0.869	63.069	0.000		0.645
X (TL) -> X2 Inspirational motivation	0.896	0.803	40.889	0.000		
X (TL) -> X3 Intellectual Stimulation	0.918	0.844	39.064	0.000		
X (TL) -> X4 Individual Consideration	0.907	0.823	44.306	0.000		

Source: SmartPLS Output 3.3.3

Table 6

Convergent Validity Assessment Results

Virtual Learning Effectiveness Variables

Indicator	**Loading Factor (λ)**	**Indicator Reliability (λ^2)**	**t_{count}**	**P value**	**Information**	**AVE**
Y1 Attitude						**0,852**
Y01	0.916	0.840	64.013	**0.000**	Valid	
Y02	0.930	0.864	89.244	**0.000**	Valid	
Y2 Ability to understand						**0,844**
Y03	0.919	0.845	50.177	**0.000**	Valid	
Y04	0.919	0.844	49.032	**0.000**	Valid	
Y3 Perseverance						**0,813**
Y05	0.917	0.841	60.181	**0.000**	Valid	
Y06	0.886	0.785	24.386	**0.000**	Valid	
Y4 Opportunity						**0,902**
Y7	0.948	0.898	95.877	**0.000**	Valid	
Y8	0.952	0.907	108.319	**0.000**	Valid	
Y5 Quality of instruction						**0,822**
Y9	0.897	0.805	35.722	**0.000**	Valid	
Y10	0.915	0.838	61.455	**0.000**	Valid	
Y Y (VLE) -> Y1 Attitude	0.869	0.755	29.598	0.000		0,678
Y Y (VLE) -> Y2 Ability to understand	0.896	0.802	36.978	0.000		
Y Y (VLE) -> Y3 Perseverance	0.908	0.825	47.774	0.000		
Y Y (VLE) -> Y4 Opportunity	0.889	0.790	40.516	0.000		
Y Y (VLE) -> Y5 Quality of instruction	0.916	0.838	49.059	0.000		

Source: SmartPLS Output 3.3.3

The results of the calculation of the loading factor for 12 indicators of the latent variable Transformational Virtual Leadership (X) and 10 indicators of the latent variable Effectiveness of Virtual Learning (Y) range from 0.8 to 0.9. The loading factor values obtained are all greater than 0.7.

These results indicate that the loading factor value meets Convergent Validity. The loading factor value above 0.7 for each item indicates that all indicators are valid so that no manifest variables for each latent variable are eliminated from the model. The tcount value obtained for each loading factor is greater than 1.984 (t table value) so that it can be said that the manifest variable (indicator) used is significant in measuring the variables of Virtual Transformational Leadership and Virtual Learning Effectiveness.

The results of the calculation of loading factors and t-statistics show that there are 12 indicators of the latent variable Transformational Virtual Leadership (X) and 10 indicators of the latent variable Effectiveness of Virtual Learning (Y) which have a positive and significant relationship in determining each of the latent variables used.

Calculation results Indicator reliability (2) for each indicator of the two latent variables) is greater than 0.5. This shows that the measurement model for each latent variable has met Convergent Validity.

For the Convergent Validity assessment by looking at the average variance extracted (AVE) value, based on the values in the table above, it can be seen that the AVE value for the Virtual Transformational Leadership Latent Variable is 0.645 and the AVE value for the Virtual Learning Effectiveness Latent Variable is 0.678. The average variance extracted (AVE) value for each latent variable obtained is greater than 0.5. This shows that more than 50% of the information contained in each indicator can be reflected through latent variables. So that it can be said that the construct indicators formed from the indicators already describe the information from the indicators of the two latent variables (Virtual Transformational Leadership and Virtual Learning Effectiveness).

Discriminant validity

Discriminant validity was assessed by Cross Loadingss and The Fornell-Larcker criterion. Discriminant validity looks at how the validity of the constructed construct is compared to other constructs, whether each concept of each latent variable is different from other variables.

Cross Loadings

The model has good Discriminant validity if each loading value of each indicator of a latent variable has the largest loading value with other loading values for other latent variables. Discriminant validity results by looking at the Cross Loadings values are obtained in Table 7.

Table 7

Discriminant validity value (Cross Loadings)

	X (TL)	Y (VLE)	X1 Idealized influence	X2 Inspirational motivation	X3 Intellectual Stimulation	X4 Individual Consideration	Y1 Attitude	Y2 Ability To understand	Y3 Perseverance	Y4 Opportunity	Y5 Quality of instruction
X.01	**0.845**	0.603	**0.852**	0.757	0.751	0.736	0.680	0.402	0.592	0.491	0.530
X.02	**0.781**	0.573	**0.870**	0.750	0.634	0.617	0.622	0.423	0.541	0.468	0.507
X.03	**0.712**	0.557	**0.793**	0.634	0.594	0.592	0.505	0.479	0.533	0.444	0.528
X.04	**0.794**	0.577	0.786	**0.910**	0.618	0.600	0.614	0.416	0.592	0.426	0.533
X.05	**0.813**	0.588	0.781	**0.884**	0.656	0.660	0.612	0.389	0.646	0.458	0.521
X.06	**0.770**	0.574	0.697	**0.860**	0.661	0.601	0.592	0.444	0.526	0.467	0.536
X.07	**0.835**	0.617	0.751	0.662	**0.913**	0.718	0.643	0.468	0.567	0.539	0.540
X.08	**0.843**	0.626	0.747	0.670	**0.893**	0.761	0.661	0.459	0.587	0.524	0.567
X.09	**0.798**	0.570	0.630	0.633	**0.891**	0.746	0.592	0.431	0.509	0.475	0.543
X.10	**0.834**	0.650	0.715	0.655	0.762	**0.906**	0.677	0.462	0.612	0.558	0.595
X.11	**0.806**	0.587	0.669	0.596	0.770	**0.898**	0.603	0.430	0.558	0.507	0.526
X.12	**0.796**	0.711	0.702	0.632	0.684	**0.881**	0.677	0.581	0.647	0.658	0.614
Y.01	0.695	**0.768**	0.664	0.614	0.629	0.633	**0.916**	0.604	0.623	0.560	0.735
Y.02	0.739	**0.834**	0.671	0.650	0.669	0.709	**0.930**	0.662	0.733	0.682	0.728
Y.03	0.412	**0.824**	0.367	0.345	0.366	0.424	0.618	**0.919**	0.711	0.727	0.724
Y.04	0.614	**0.822**	0.580	0.518	0.560	0.581	0.644	**0.919**	0.708	0.667	0.745
Y.05	0.611	**0.876**	0.549	0.531	0.558	0.591	0.702	0.797	**0.917**	0.771	0.741
Y.06	0.691	**0.755**	0.655	0.682	0.557	0.634	0.621	0.581	**0.886**	0.649	0.637
Y.07	0.675	**0.826**	0.607	0.579	0.606	0.669	0.627	0.648	0.735	**0.948**	0.723
Y.08	0.517	**0.862**	0.457	0.392	0.481	0.551	0.656	0.791	0.769	**0.952**	0.685
Y.09	0.658	**0.791**	0.635	0.614	0.561	0.597	0.689	0.678	0.660	0.614	**0.897**
Y.10	0.577	**0.866**	0.498	0.478	0.549	0.575	0.745	0.767	0.730	0.724	**0.915**

Source: Output SmartPLS 3.3.3

From Table 7 it can be seen that the loading value for each indicator of each latent variable is the greatest compared to the loading value when associated with other indicators. This shows that each latent variable indicator has good discriminant validity, where the latent variable does not have a gauge that is highly correlated with other constructs.

Fornell-Larcker criteria

The results of the calculation of the Fornell-Larcker criteria obtained using the Smart PLS 3.3.3 application can be seen in Table 8 below:

Table 8

Correlation value of Latent Variable and Discriminant validity

	X Transformational Leadership (TL)	**Y Virtual Learning Efectiveness (VLE)**
X Transformational Leadership (TL)	0.803	

Y Virtual Learning Efectiveness (VLE)	0.751	0.823

Description = the value on the diagonal of the matrix is the root value of AVE

Source: Output SmartPLS 3.3.3

The results of the correlation between the constructs and the AVE root values in table 9 show that the AVE root values are greater than the correlation values between the constructs of the research variables. These results indicate that the discriminant validity of the latent variable is already high and the construct has good consistency.

Structural Model Testing (Inner Model)

The structural model (inner model) is assessed using the R-square value. The R2 value indicates the prediction accuracy of the model. (Hair, 2017). The R2 value is equal to 0.25 which has a weak effect, 0.5 has a moderate effect and 0.75 has a substantial effect (Chin, 2010).

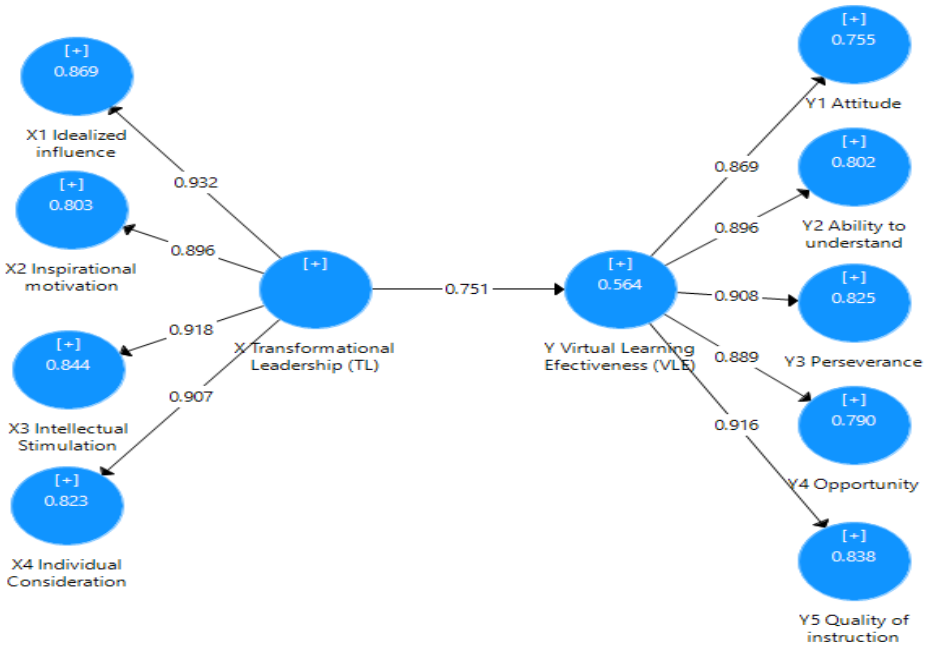

Figure 2
Structural Model

The R-square results for the research model are presented in Table 9 as follows.

Table 9

R-Square value

Endogen Variabel	**R Square**	**R Square Adjusted**
Y Virtual Learning Effectiveness	0,564	0.560

The R-square value for the Virtual Learning Effectiveness variable is 0.564. The R2 value is in the range between 0.5 to 0.75. These results indicate that 56.4% of the Effectiveness of Virtual Learning is influenced by the Virtual Transformational Leadership variable. The prediction accuracy of the model has a fairly strong (moderate) effect.

Hypothesis Testing of the Effect of Virtual Transformational Leadership on the Effectiveness of Virtual Learning

To test the proposed hypothesis, the t-statistic value can be seen. The limit for rejecting and accepting the proposed hypothesis is if the t value is greater than ttable or the p-value is smaller than 0.05 then the hypothesis will be rejected or accept the null hypothesis (H0). The ttable value for n = 100 is 1.984.

The statistical hypothesis tested is as follows:

H0 : $\gamma 1 = 0$: Virtual Transformational Leadership has no effect on the Effectiveness of Virtual Learning

H1 : $\gamma 1 \neq 0$: Virtual Transformational Leadership influences the Effectiveness of Virtual Learning

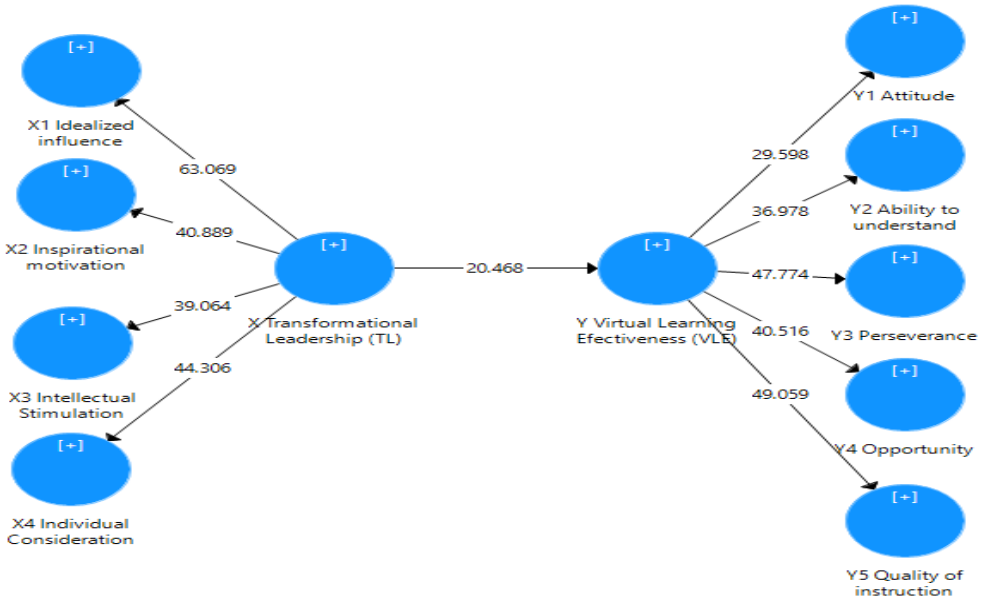

Figure 3

Structural Model Statistical T Value

The results of calculating the t test values are presented in Table 10 below:

Table 10

Calculation Results of Influence Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	p-values
X Transformational Leadership (TL) -> Y Virtual Learning Efectiveness (VLE)	0.751	0.751	0.037	20.468	0.000

Source: PLS Calculation Results

The calculation results show that the relationship between Virtual Transformational Leadership and Virtual Learning Effectiveness is shown by the path coefficient value of 0.751 with a tcount of 20.468 and a p value of 0.000.

Table 11

Significance Test of the Effect of Virtual Transformational Leadership on the Effectiveness of Virtual Learning

Path Coefficient	t_{count}	P value	Conclusion
0,751	20,468	0.000	Significant

Source: PLS Calculation Results

The t-statistic value obtained is greater than the critical (1.984) and the p-value (0.000) is smaller than the alpha value of 0.05. This result means that Virtual Transformational Leadership influences the Effectiveness of Virtual Learning. Virtual Transformational Leadership has an influence of (0.751 × 0.751 × 100%) = 56.4% on the Effectiveness of Virtual Learning.

DISCUSSION

Learning effectiveness is a measure of the success of the interaction process in educative situations to achieve learning objectives. This effectiveness is seen from the activities during learning, response and concept mastery. The process of interaction in learning certainly involves students as students and also lecturers as educators. Lecturers are responsible for ensuring that learning information in the form of lecture material can be conveyed and well received by students. In this regard, the figure and way of communicating a lecturer, which can be seen from the leadership style approach used by the lecturer in the classroom, becomes important and is assessed by students, and indirectly affects interactions in the learning process with students.

Lecturer virtual transformational leadership has a positive effect on the effectiveness of virtual learning. The results of the study stated that the transformational leadership variable had a direct, moderate effect on the variable effectiveness of virtual learning, namely 11.6%. This means that the transformational leadership style approach used by lecturers encourages increasing the effectiveness of the virtual learning that is carried out. This finding is in line with the results of previous research which stated that a transformational leadership style can lead to high success rates for project success in virtual settings.

The figure or figure of a lecturer who is charismatic and authoritative tends to have a psychological impact on his students, including trust and a sense of pride because they feel they have the right lecturer in delivering lecture material. Students feel confident about the learning process that will be carried out, because from the beginning the lecturer gave a clear explanation of the course objectives.

In the academic learning process, the lecturer's way of communicating becomes a determinant in the learning interaction activities with students. Trust from students is welcomed by the way lecturers communicate high expectations for mastery of lecture material to their students. This means that interaction begins to be built on the basis of mutual trust between lecturers and students. Which is then followed by the way the lecturer conveys the direction of the course in an interesting way, the ability of the lecturer to focus student efforts on learning, and inspiring students on the benefits of studying the lecture material delivered. Because in virtual learning, of course the process of interaction activities becomes more challenging because it is not face to face face to face.

It is hoped that with a good interaction process a lecturer will be able to provide intellectual stimulation in the learning process. Lecturers are expected to be able to stimulate students in the fields they study, encourage student creativity through teaching materials, provide interesting illustrations to increase student rationality and intelligence, and train students to find solutions to problems carefully.

Besides that, apart from academic support in the learning process, personal lecturer support for students also has its own impact. With the support of a lecturer, students will feel cared for because they not only have to do each assignment, but personally the lecturer knows what students need and the problems they face. Students who feel that the lecturer cares and treats students individually will be more enthusiastic and motivated so as to encourage students to achieve more than expected and create learning effectiveness.

Based on the data obtained in the research, it can be said that in general virtual learning has been running effectively, this is shown from the research instrument data which states that students after participating in learning have clear goals that can be achieved. Students are able to detail the details of an idea so that it becomes more interesting and has an interest in cases in the field that require critical thinking solutions. This is because students are able to understand the concepts/theories being taught so as to make these students able to understand the conditions of the situation in the field with the right concept/theory approach.

Even in carrying out assignments, most students after participating in learning have persistence in doing tasks that are routine in nature and are motivated to do heavy assignments, and are able to prepare time for further learning by detailing the details of an idea so that it is more interesting. Such things are a form of attitude of responsibility for their expertise, including to internalize a spirit of independence and entrepreneurship that needs to be improved again after participating in learning.

In an effort to increase the effectiveness of virtual learning, this study shows that 65.2% of the effectiveness of virtual learning is influenced by the variables of virtual transformational leadership and student creativity. This means that the virtual transformational leadership style approach used by lecturers and also the creativity possessed by students encourages an increase in the effectiveness of virtual learning that is carried out. This shows that there is a relationship between the transformational leadership style used by lecturers, coupled with the creativity possessed by students can create effective virtual learning.

Lecturers and students as the main actors build good relationships and communication and synergize in carrying out the process of learning activities. The lecturer's leadership style in the class is an ideal influence for students, how does the figure of the lecturer become a charismatic figure and is trusted by students to be the starting point of communication or interaction that will be built with students. The communication that is carried out in the delivery of material and the direction of lecture goals convinces students in the learning process, how is the intellectual stimulation provided by lecturers when delivering lecture material also helps students improve their rationality, intelligence and creativity. Students are trained to look at a problem from different points of view, so that later the unique ideas and ideas that students have are developed, directed and honed in such a way in the learning process, so that students are able to think of various alternative solutions in solving the problem. Besides that, for certain things that are personal in nature, lecturers are able to sympathize, provide moral support and treat students as individuals, especially for students who have problems and need special coaching. Students feel cared for and given empathy when facing problems will be more motivated and able to develop ideas to find a way out in solving the problem.

The transformational leadership style used by lecturers indirectly helps hone students' ability to spark new ideas and develop them into a unique potential that can be utilized in learning. The synergy of interaction between lecturers and students produces an effective virtual learning process, where the learning process carried out has an impact on attitudes or attitudes of students to be more responsible in carrying out the learning process, increasing ability or ability to understand material, supporting the fulfillment of lecture assignments , providing opportunities to achieve clear goals, as well as sharpening students' critical thinking in dealing

with various existing problems and obstacles, which in turn creates the effectiveness of virtual learning as a whole.

CONCLUSION

At the end of this report, the researcher will present several conclusions based on the research objectives and the findings of the research as well as the description in the previous chapters regarding the problem under study, including:

1. Virtual transformational leadership is in the "very high" category. This means that the lecturer uses a very high transformational leadership style in virtual learning. The lowest average score in the transformational leadership variable indicates the lecturer's willingness to personally guide students who are at fault. In contrast, the highest average score in the transformational leadership variable indicates the lecturer's ability to communicate high expectations for mastery of course material. This means that lecturers already have good skills in communicating high expectations in mastering lecture material, but in some instances, there are still lecturers who are unwilling to provide personal coaching to students who are at fault.
2. The effectiveness of virtual learning is in the "high" category. This means that the level of effectiveness of virtual learning that has been carried out is felt or assessed by respondents as high or effective. The lowest average score in the learning effectiveness variable indicates the ability to internalize the spirit of independence and entrepreneurship after participating in learning. In contrast, the highest average score in the learning effectiveness variable indicates clear goals that can be achieved. This shows that in the effectiveness of virtual learning, students have clear goals that can be achieved after participating in learning, but they still experience difficulties or obstacles in internalizing their independent and entrepreneurial spirit.
3. The lecturer's virtual transformational leadership positively affects the effectiveness of virtual learning. The direct effect of virtual transformational leadership on the effectiveness of virtual learning is included in the moderate category. This means that the transformational leadership style approach used by lecturers is sufficient to encourage increased effectiveness of virtual learning.

Based on the results of the analysis and assessment of research results in the field, the following recommendations can be conveyed by the authors, so that they are beneficial for higher education institutions and for further research. This recommendation is taken from the indicator with the lowest score, namely lecturers must provide intellectual stimulation to students, especially in increasing student intelligence in understanding, developing, and implementing the lecture material being taught. The method, for example, is by giving lots of case questions and students are asked to analyze these cases starting from finding problems that arise, the causes of problems arising, to finding solutions to these problems. Thus the intellectual side of students continues to be stimulated so that aspects of intelligence that are relevant to teaching materials will emerge.

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