

# Vocational Students Learning Difficulties Factor in Online Learning

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**Abstract**—This study aims to determine the factors that affected students learning difficulties when learning online in the Construction and Property Engineering Expertise Program 2020/2021 at SMK Negeri 4 Kota Tangerang. The data analysis used was confirmatory factor analysis with a population of all students of the Construction and Property Engineering expertise program. The sample was taken using non-probability sampling technique with convenience sampling method. Data collection using a questionnaire method with a Likert scale. The factor analysis procedure uses the calculation of MSA (Measure of Sampling), KMO (Kaiser Major Olkin), and Bartlett Test Sphericity values, eigenvalues, communalities values, factor extraction, factor loading, and varimax rotation. Based on research, the 3 causes of learning difficulties when online learning is the condition of online learning, self-management factors, and facility support. If the condition factors at the time of online learning are paid attention, then students will better understand the material given by teachers.

**Keywords**—factor analysis, learning difficulties, online learning, SMK Negeri 4 Kota Tangerang

## I. INTRODUCTION

The Covid-19 pandemic has caused learning that was previously carried out offline or face-to-face to turn online (in the network) or carried out online. Most teachers use the Google Classroom platform to distribute learning materials that will be given to students to learn. Based on the researcher's initial observations when carrying out online learning with video conferencing, some students did not attend on time or were late for class. Some of the reasons given by students when they do not attend classes such as the absence of a quota, no signal, and so on. For the same reasons, students are also late in collecting the assignments that have been given. Competence of students will be good if students are active during the learning process.

In the implementation of online learning, there are advantages, namely in teaching and learning activities it is easier to reach from various times and places. According to Pujiasih [1] of 322 students, there are 45% of students who are happy with online learning and 55% of students are not happy

with online learning. Obstacles that exist in the online learning process can cause students to experience difficulties in learning. Students' difficulties in learning are divided into two factors, namely internal factors, and external factors. In internal factors there are psychological factors and physiological factors. According to Meliani [2] psychological factors are found in the intelligence of students, talents or potentials possessed by students, and mental health which also affects students' learning difficulties. According to Immanuel [3] physiological factors can be in the form of illness and being unwell so that it is easier to feel tired, reduce the sense of enthusiasm that students have, and make students' minds become disturbed. In external factors, there are social and non-social factors. In the results of previous research, according to Annur and Hermansyah [4] students are faced with several difficulties that can be classified into adaptation difficulties such as unfavorable home conditions, unfamiliar online lectures, more assignments, and difficulty in time management.

## II. METHODS

In this study using factor analysis with confirmatory type. The data analysis process in this study utilized the SPSS (Statistical Package for Social Science) 26 application. The population in this study were students at SMK Negeri 4 Tangerang City in the field of construction and property engineering expertise in the 2020/2021 academic year.

TABLE I. STUDENTS OF CONSTRUCTION AND PROPERTY ENGINEERING EXPERTISE IN 2020/2021

Skill Program	Total
DPIB 1	94
DPIB 2	92
BKdP 1	82
BKdP 2	81
KGSP	83
Total	432

The sample size of this study was determined using the Slovin formula with an error rate of 10%. The sampling

technique or sampling technique in this study uses a non-probability sampling technique. The researcher used non-probability sampling technique using convenience sampling

method. The data collection technique in this study used a questionnaire/questionnaire using a Likert scale.

TABLE II. RESEARCH INSTRUMENTS

Indicator	Sub Indicator	Variable	Sub Variable	No. Variable	Source
Internal	Psychology	Student motivation	Interest to learn	X1	(Dalyono, 2015)
			Student attendance	X2	
			Carry out a task	X3	
			Discipline	X4	
			Study diligently	X5	
			Note material	X6	
			Study habits	X7	
			Responsive	X8	
	Physiology	Body state	Spirit	X9	
			Healthy	X10	
			Not seriously ill	X11	
			No mild pain	X12	
Eksternal	Social	Home situation	Good internet	X13	
			Quiet house	X14	
		Family economy	Study room	X15	
			Study facilities	X16	
	Non-social	Teaching method	Material giving	X17	
			Learning resources	X18	
			Self task is enough	X19	
			Enough group work	X20	
			Student activity	X21	

A. Data Description

TABLE III. NUMBER OF SUBJECTS BASED ON GENDER

Gender	Quantity
Male	118
Female	64
Total	182

TABLE IV. NUMBER OF SUBJECTS BASED ON EXPERTISE PROGRAM

Skill Program	Total
KGSP	29
DPIB 1	37
DPIB 2	66
BKdP 1	26
BKdP 2	24
Total	182

B. Data Analysis

1) *Kaiser Mayor Olkin (KMO) dan Bartlett's test of sphericity*: KMO is used to determine whether the factor analysis process can be carried out or not. The requirement of the KMO value is above 0.5, if the KMO value is below 0.5 then the factor analysis process cannot be continued. Bartlett's Test of Sphericity is used to determine whether the variables in the study have a correlation or not. Bartlett's Test of Sphericity can be seen from the significance value. Malhotra [5] The variables have a correlation if the significance value is less than 0.05.

TABLE V. KAISER MAJOR OLKIN (KMO) VALUES

KMO and Bartlett's Test		
Kaiser Meyer Olkin Measure of Sampling Adequacy		0.939
Bartlett's Test of Sphericity	Approx. Chi Square	2863.550
	df	210
	Sig.	0.00

From the table, the factor analysis can be continued because the KMO value is above 0.5 and the significance value of Bartlett's Test of Sphericity is less than 0.05.

2) *Measure of Sampling Adequacy (MSA)*: Each variable needs to be analyzed further so that it can be seen whether it is adequate or not using MSA. If the variable has MSA > 0.65 then the variable can be used. Variables that have MSA < 0.65 cannot be used and must be removed.

TABLE VI. TABLE OF MEASURE OF SAMPLING ADEQUACY (MSA)

Variable	Anti-image correlation matrix	Standard Minimum
X1	0.922	0.65
X2	0.927	0.65
X3	0.917	0.65
X4	0.939	0.65
X5	0.950	0.65
X6	0.964	0.65
X7	0.958	0.65
X8	0.940	0.65
X9	0.933	0.65
X10	0.964	0.65
X11	0.901	0.65
X12	0.897	0.65
X13	0.945	0.65

Table VI. Cont.

Variable	Anti-image correlation matrix	Standard Minimum
X14	0.919	0.65
X15	0.954	0.65
X16	0.960	0.65
X17	0.956	0.65
X18	0.941	0.65
X19	0.913	0.65
X20	0.927	0.65
X21	0.975	0.65

From the results contained in the SPSS 26 output, there are 21 variables with each MSA value above 0.65. All variables meet the requirements, so that the analysis process can be continued.

3) *Eigen values*: Variables that meet the requirements in the calculation of correlation can be continued with the formation of factors that will be the basis of the relationship between variables.

TABLE VII. EIGEN VALUES

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	11.099	52.852	52.852
2	1.749	8.327	61.179
3	1.111	5.286	66.465
4	0.847	4.032	70.497
5	0.799	3.806	74.303
6	0.603	2.870	77.173
7	0.561	2.673	79.846
8	0.532	2.534	82.38
9	0.48	2.286	84.666
10	0.45	2.143	86.809
11	0.414	1.973	88.782
12	0.364	1.735	90.517
13	0.33	1.573	92.09
14	0.282	1.343	93.433
15	0.266	1.269	94.702
16	0.245	1.165	95.867
17	0.222	1.057	96.924
18	0.215	1.023	97.946
19	0.187	0.889	98.835
20	0.149	0.711	99.546
21	0.095	0.454	100

From the table above, those that have more than one eigenvalue are in factor 1, factor 2, and factor 3. Therefore, the factors that will be used are 3 factors. The criteria for the percentage of total variance can be seen in the table for the % of variance section. The criteria for the percentage of total variance can be met because the three factors formed can represent 21 variables with a cumulative total of 66.465%. The

scree plot criterion is the number of factors combined into a plot of eigenvalues.

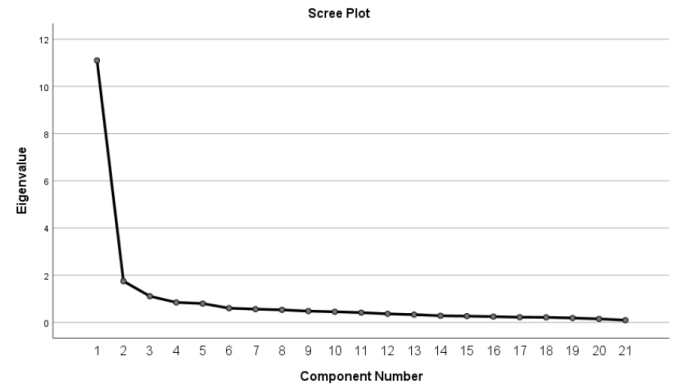


Fig. 1. Scree plot.

4) *Communalities*: The communalities value is used to determine how much factor 1, factor 2, and factor 3 are in explaining the variance of an original variable.

TABLE VIII. COMMUNALITIES VALUE

	Communalities	
	Initial	Extraction
X.1	1.000	0.523
X.2	1.000	0.806
X.3	1.000	0.807
X.4	1.000	0.668
X.5	1.000	0.677
X.6	1.000	0.762
X.7	1.000	0.677
X.8	1.000	0.664
X.9	1.000	0.688
X.10	1.000	0.645
X.11	1.000	0.715
X.12	1.000	0.671
X.13	1.000	0.670
X.14	1.000	0.727
X.15	1.000	0.659
X.16	1.000	0.671
X.17	1.000	0.721
X.18	1.000	0.661
X.19	1.000	0.552
X.20	1.000	0.458
X.21	1.000	0.534

5) *Loading factors*: The loading factor is used to show the correlation of each variable to the factors that have been formed.

**TABLE IX. LOADING FACTOR VALUE**

	Component		
	Factor 1	Factor 2	Factor 3
X.1	0.511	0.427	-0.282
X.2	0.792	-0.422	-0.022
X.3	0.816	-0.373	-0.047
X.4	0.769	-0.266	-0.073
X.5	0.740	0.245	-0.263
X.6	0.808	-0.048	-0.327
X.7	0.739	0.071	-0.355
X.8	0.721	-0.287	-0.249
X.9	0.772	0.158	-0.260
X.10	0.766	-0.117	0.210
X.11	0.709	-0.333	0.318
X.12	0.678	-0.351	0.297
X.13	0.667	0.342	0.330
X.14	0.653	0.425	0.347
X.15	0.766	0.234	0.133
X.16	0.739	0.191	0.297
X.17	0.807	-0.254	0.078
X.18	0.709	0.390	0.076
X.19	0.645	0.368	-0.030
X.20	0.672	0.041	-0.068
X.21	0.718	-0.117	-0.069

In factor 3 all variables included in the factor have a value of less than 0.4, so factor 3 does not have a variable. To overcome this, varimax rotation can be done.

6) *Varimax rotation*: Varimax rotation is used to clarify the loading factor.

**TABLE X. VARIMAX ROTATION**

	Component		
	Factor 1	Factor 2	Factor 3
X.1	-0.011	0.632	0.351
X.2	0.834	0.303	0.137
X.3	0.810	0.352	0.165
X.4	0.697	0.382	0.190
X.5	0.278	0.681	0.369
X.6	0.525	0.672	0.187
X.7	0.388	0.696	0.208
X.8	0.652	0.486	0.045
X.9	0.362	0.667	0.335
X.10	0.632	0.209	0.450
X.11	0.767	0.023	0.356
X.12	0.756	0.017	0.315
X.13	0.252	0.211	0.750
X.14	0.184	0.218	0.804
X.15	0.365	0.382	0.616
X.16	0.404	0.226	0.676
X.17	0.737	0.288	0.307
X.18	0.205	0.448	0.647
X.19	0.161	0.488	0.536
X.20	0.410	0.426	0.329
X.21	0.555	0.400	0.256

The results of the rotation calculation have shown that all variables have a group of factors. It can now be seen that all factors have constructors of variables, where:

- factor 1 has 9 forming variables

- factor 2 has 6 forming variables
- factor 3 has 6 forming variables.

Furthermore, the naming of factors is based on the variables that make up these factors. Looking at the variables that have been grouped, the factor names are changed to:

- Factor 1 = Factor during Online Learning
- Factor 2 = Self-management
- Factor 3 = Facility support

### III. RESULTS AND DISCUSSION

#### A. Factors During Online Learning

The most dominant factor that influences is the condition factor during online learning, which has 9 forming variables and has a total variance percentage of 52.852%. A total of 57.7% or as many as 105 students agree that teachers always provide material during online learning. The provision of material is one of the external causes of learning difficulties. Where in the non-social external causes there is a teaching method that has sub-variables of providing material that is the cause of learning difficulties.

Tafonao [6], the delivery of material from the teacher greatly affects the students. The learning process will be more effective and efficient while making the relationship between teachers and students even better. Ristiyani and Bahriah [7], there are also other studies which state that the teacher indicator is one of the high categories in the success of student learning, so to overcome this the teacher must determine the approach and choose the method according to the student's circumstances.

As many as 38.5% or as many as 70 respondents answered agree if they had never had a serious accident. Serious accidents that become the standard in this study are accidents that require hospitalization. One of the causes of internal physiology learning difficulties is the state of the body which has a non-severe sub-variable.

#### B. Self Management

Self-management factors can explain 21 variables with a percentage of 8.327%. This self-management factor has 6 forming variables. A total of 102 students or 56% of students answered agree that they have a habit of recording the material that has been given by the teacher. The habit of students is one of the internal causes of learning difficulties, especially learning difficulties that come from the psychology of students, namely the motivation of students in learning.

The study habits of students can affect the learning difficulties of the students themselves. If students have bad study routines, such as delaying studying, they are less diligent in taking notes. Recording Materials Strongly Agree Agree Disagree Strongly Disagree 42 materials, and other bad study habits will make students have learning difficulties. Related to

study habits, there are studies which state that study habits are one of the factors that cause students to have learning difficulties. Rispryanto [8], learning difficulties caused by these study habits can be overcome by the way the teacher gives encouragement to students not to be lazy to take notes, not to be lazy to do assignments, and to prepare books for lessons.

There are only 32.4% or as many as 59 respondents who are interested in participating in online learning. This means that many respondents do not agree with online learning. The interest of students in learning is one of the internal psychological factors that enter the motivation of students and become one of the causes of learning difficulties. The absence of interest in learning will cause learning cannot be processed in the brain, so it will cause learning difficulties.

### C. Facility Support

The facility support factor is the last factor which has a total variance percentage of 5.286% and has 6 forming variables. A total of 53.3% or as many as 97 students answered agree, which means 97 students have parents who provide facility support. Learning facilities are one of the variables of learning difficulties that are influenced by the family economy. Where the family economy is included in the external social causes of students' learning difficulties.

Khasanah and Suryani [9], parental support can be about the relationship between parents and students, how to educate children, and the family economy which can affect the support facilities provided by parents. Other relevant research explains if parental support is a factor that can cause learning difficulties. Rahman [10], parental support in the study regarding the fulfillment of learning needs, parental attention, and the income of parents.

There are 39% or as many as 71 respondents answered agree if you have a good internet network at home. That is, there are still many students who have a poor internet network. The internet network has entered the cause of learning difficulties that are influenced by the family economy, where the family economy is one of the external social causes of learning difficulties. Seeing the learning that is done online, the internet network is one of the facilities that is a necessity in carrying out learning today.

## IV. CONCLUSIONS AND SUGGESTION

The condition factor when online learning is the dominant factor that can affect students' learning difficulties when learning online in the Construction and Property Engineering Expertise Program 2020/2021 at SMK Negeri 4 Tangerang

City with the highest forming variable regarding material delivery.

The self-management factor is the second factor that can affect students' learning difficulties when learning online in the Construction and Property Engineering Expertise Program 2020/2021 at SMK Negeri 4 Tangerang City with the dominant forming variable regarding recording material.

The facility support factor is the third factor that can affect students' learning difficulties when learning online in the Construction and Property Engineering Expertise Program 2020/2021 at SMK Negeri 4 Tangerang City with the highest forming variable regarding learning facilities

Suggestions for further research, For further researchers:

- Using indicators from other relevant research results
- Can research learning difficulties using other research methods such as Exploratory Factor Analysis

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