Jambura Physics Journal (2022) Vol.4 (2): 134-150
DOI: 10.34312/jpj.v4i2.17286

Jambura Physics Journal

p-ISSN: 2654-9107 e-ISSN: 2721-5687
Journal homepage: http://ejurnal.ung.ac.id/index.php/JPJ

ANALYSIS OF STUDENT PERCEPTIONS ON THE USE OF ONLINE LEARNING APPLICATIONS USING THE RASCH MODEL IN PHYSICS LEARNING

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Received: 04 December 2021. Accepted: 05 July 2022. Published: 10 October 2022

ARTICLE INFO

Keywords:

Perception; Rasch Model; Online Learning

How to cite:

Setiawan, D.E, et al. (2022). Analysis of Student Perception on the Use of Online Learning Applications Using The Rasch Model In Physics Learning. *Jambura Physics Journal*. Vol 4 (2): 134-150

DOI:
https://doi.org/10.34312/jpj.v4i2.17286

ABSTRACT

SMAN 1 Tapa initially used the Zoom and Google Meet applications, but there were still many students who were late for learning due to their difficult circumstances in getting internet coverage, so the teachers decided to change the application by using Classroom and Whatsapp to minimize student delays in learning. This study aims to describe students' perceptions of the use of online learning applications using Rasch modeling in physics learning. This research method is descriptive qualitative. The results of this study indicate that students' perceptions based on absorption indicators of object stimuli from outside the individual, students prefer online learning using Classroom and Whatsapp applications. Based on the indicators of understanding or understanding of the object, students understand and understand physics learning. Based on the indicators of individual evaluation of the object, students are enthusiastic and motivated in learning physics. Thus, it can be concluded that students' perceptions of online learning using the classroom and whatsapp applications can help and facilitate students in the learning process during the pandemic in class XI IPA 1.

1. Introduction

Online learning is learning that is done without face-to-face but through a platform that has been provided, with online learning students have the flexibility in learning time, can learn anytime and anywhere. Online learning is a solution during a pandemic, but online learning is not as easy as imagined, there are several obstacles experienced by students, especially in physics subjects who often do practical work and the material is quite difficult and requires a lot of calculations, as happened at SMAN 1 Tapa which initially used Zoom and Google Meet applications when using the Zoom and Google Meet applications, many students are late for learning materials and some even don't attend at all because their place of residence is difficult to get internet network coverage so teachers decide to replace online learning applications using Google Classroom and Whatsapp to minimize delays in students in participating in learning. Students also need time to adapt to new changes that will indirectly affect the absorption of learning both in theory and practice, there is a concentration disorder during the learning process, does not support the internet connection which sometimes experiences interference so that it hinders the delivery of learning material. In addition, the technological and economic abilities of each student are different so that not all students support online learning activities. Based on the problem formulation, this study aims to describe students' perceptions of the use of online learning applications using Rasch modeling in physics subjects.

According to Slameto (2013), as one of the responses that humans have, perception determines the process of receiving information. Rahmat (2011) argues that the experience experienced by every human being that gives birth to the interpretation of the message can also be classified as perception.

Walgito (2010) argues that various stimuli received by the five senses can be categorized as perceptions. According to Irwanto (2014), various symptoms that are a form of sensing can be categorized as perceptions because the symptoms from various events experienced produce new thoughts so that they give birth to perceptions, so there are those who state perception as "the interpretation of experience".

So perception is a direct response obtained from a person's absorption to know some things through sensing. Perception is subjective, because it depends on the circumstances and abilities of each individual, so that individual interpretations will differ from one individual to another.

The occurrence of perception in the individual does not just happen, but through a process, the perception process is a two-way event, namely as a result of action and reaction. According to Bimo Walgito (2010) in order for individuals to be aware and hold perceptions, there are several conditions that need to be met, namely:

a. The existence of a perceived object, the object causes a stimulus that hits the senses. Stimulus can come from the outside directly on the senses (receptors) or come from the inside that directly hits the receiving nerve (sensory) which works like a receptor.
b. Sensory organs or receptors, which are tools to receive stimuli. Besides, there must also be sensory nerves as a tool to transmit the stimulus received by the receptor to the central nervous system, namely the brain as the center of consciousness.
c. The existence of daily, attention is the first step in preparation for making perceptions. Without attention there will be no perception in a person.

Perception also has the following indicators:

a. Absorption of stimuli or objects from outside the individual. Stimuli or objects are received and absorbed by the five senses individually or together. The results of absorption by the five senses will provide a picture, response, or impression in the brain.
b. Understanding or understanding of the object. After the images occur in the brain, the images are organized, classified, and interpreted so that an understanding or understanding of an object is formed.
c. Individual assessment or evaluation of the object. After forming an understanding or understanding, then an individual assessment is formed. Individuals compare the newly acquired understanding with the criteria or norms that the individual has subjectively. Individual judgments vary even though the object is the same. Therefore perception is individual.

Based on the opinion of Thoha (2011) and Fatah Syukur (2006), it is stated that the factors that influence perception are internal or individual factors including interest and attention, while external factors include perceived objects and the environment. From these factors one can perceive the same object but the result of perceiving is different.

Bilfaqih and Qomarudin (2015) argue that online learning makes it possible to reach study groups massively and widely without being limited by space and time and only relying on an internet connection. Thorme (Kuntarto 2017), states that online learning uses various modern learning support equipment such as laptops, LCDs, video streaming, and so on. Assignments and materials are also carried out relying on electronic messages and internet connections. This refers to the opinion of Rosenberg (Alimuddin, et al. 2015) who argues that the use of the internet will improve students' skills according to the times.

Bifaqih and Qomarudin (2105) explain some of the benefits of online learning, namely, it is more diverse along with the accompanying technological developments. Online learning can improve interaction and the quality of learning, in addition, education actors also more easily access learning materials from anywhere and anytime so that they can reach teachers and students in learning only through internet access which is owned by everyone in all places.

The analysis using the Rasch model results in a statistical fit (fit statistic) that provides information to researchers whether the data obtained ideally illustrates that people who have high abilities provide patterns of answers to items according to their level of difficulty. The parameters used are infit and outfit from the mean square and standardized values. According to Sumintono and Widhiarso (2013), infit (inlier sensitive or information weighted fit) is the sensitivity of the response pattern to the target item on the respondent (person) or vice versa; while outfit (outlier sensitive fit) measures the sensitivity of the response pattern to items with a certain level of difficulty in respondents or vice versa.

This research is expected to produce an accurate picture of the analysis of student perceptions of the use of online learning applications by using Rasch modeling in physics subjects, so that it can be used as consideration in determining online learning applications during online learning, especially in physics learning.

2. Method

The research method used in this research is descriptive-qualitative research, the reason for taking qualitative descriptive research is because the researche wants to describe the conditions that will be observed in the field in a more specific, transparent, and in-depth manner. The subjects in this study were 8 people out of 30 students of class XI IPA 1 at SMA Negeri 1 Tapa who were selected based on purposive sampling which would then see the perception of each student and also as a comparison material for researchers regarding online learning at SMA Negeri 1 Tapa.

The research instrument is the chosen tool or facility used by researchers in collecting research data. In addition, there are other instruments used in this study, namely questionnaires and interviews.

Data collection in this study was carried out by distributing questionnaire sheets and conducting interviews with research subjects. The researcher distributed class questionnaires to students which was carried out for two days because class XI IPA 1 entered shifts. Students were asked to fill out a questionnaire by choosing one of the responses from the four categories of responses provided, namely strongly agree, agree, disagree and strongly disagree to express students' perceptions of the use of online learning applications using Rasch modeling in physics subjects.

Researchers conducted interviews with students who were the subject of research through face-to-face after they finished learning. During the interview process, voice recordings will be carried out with the approval of the interviewee in order to make the interview more efficient and uninterrupted. Subjects were informed that the interviews conducted did not affect their final grades in physics lessons, so that the subjects could be open at the time of the interview. Interviews were carried out within one week after students filled out the perception questionnaire,

the aim was that students did not remember the responses they gave to the perception questionnaire too much, so that students would provide answers to interview questions without being affected by the responses they had previously given to the perception questionnaire.

Data analysis in this study was carried out using qualitative data analysis. The process of qualitative analysis in this study uses the Miles & Hubeman (2009) flow which is carried out in three grooves, namely:

a. Data reduction (data reduction)
   The data reduction process in this study was carried out by examining the data collected from various sources, namely data from questionnaires and data from interviews.
b. Presentation of data (data display)
   The presentation of data in this study was carried out in the form of narrative text accompanied by tables to describe student perceptions which were reviewed based on perception indicators.
c. Conclusion drawing/verification of data (conclusion drawing/verification)

The data found by the researcher during the research process is supported by accurate evidence so that the conclusions made are valid conclusions.

3. Result and Discussion

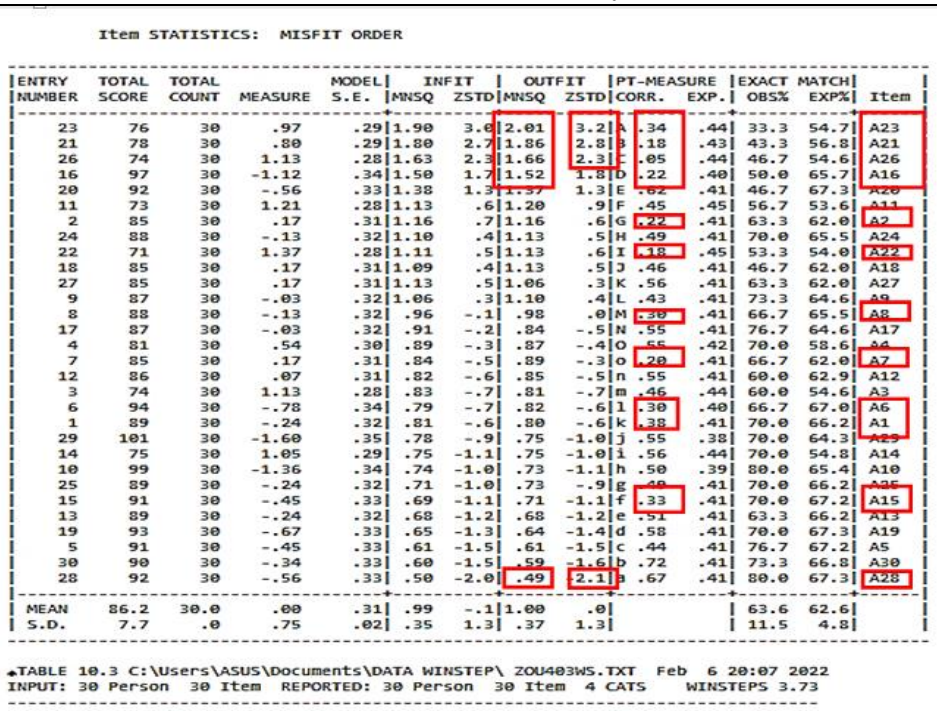
Description of Research Results

This research was conducted at SMA Negeri 1 Tapa, especially in class XI students with a total of 8 out of 30 students in class XI IPA 1 at SMA Negeri 1 Tapa who were selected based on purposive sampling. This study aims to determine and see the extent of students' perceptions of the use of online learning applications.

Analysis of Questionnaire Data Using Rasch Model Approach Using Winstep Item Conformity Test Results

Based on the output of the item fit table, it can be seen that A16, A2, A22, A8, A7, A16, A1, A15 and A28 tend not to fit. If viewed from the 3 validity criteria (OUTFIT MNSQ, OUTFIT Z-STANDARD, and point Measure Correlation) items A23, A21 and A26 do not meet any of the criteria so these items must be discarded and replaced. For other items, only one criterion is not met, so that the final conclusion is that there are only three items that must be removed and changed, and for other items it does not need to be changed

Based on the output of item dimensionality, it shows the raw variance wxplained by Measure the score is 28.5% in the "weak" category. Then based on the values observed in the unexplned variance contrast column of 13.0%, it shows that there is a tendency for item discrepancies, meaning that there are still many polluting factors on the scale, and an eigenvalue of 5.5 more than 3 indicates that there are problematic items.



Item STATISTICS: MISFIT ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	Item
23	76	30	.97	.29	1.90	3.0	2.01	3.2	A .34	.44	33.3	54.7	A23
21	78	30	.80	.29	1.80	2.7	1.86	2.8	B .18	.43	43.3	56.8	A21
26	74	30	1.13	.28	1.63	2.3	1.66	2.3	C .05	.44	46.7	54.6	A26
16	97	30	-1.12	.34	1.50	1.7	1.52	1.8	D .22	.40	50.0	65.7	A16
20	92	30	-.56	.33	1.38	1.3	1.37	1.3	E .62	.41	46.7	67.3	A20
11	73	30	1.21	.28	1.13	.6	1.20	.9	F .45	.45	56.7	53.6	A11
2	85	30	.17	.31	1.16	.7	1.16	.6	G .22	.41	63.3	62.0	A2
24	88	30	-.13	.32	1.10	.4	1.13	.5	H .49	.41	70.0	65.5	A24
22	71	30	1.37	.28	1.11	.5	1.13	.6	I .18	.45	53.3	54.0	A22
18	85	30	.17	.31	1.09	.4	1.13	.5	J .46	.41	46.7	62.0	A18
27	85	30	.17	.31	1.13	.5	1.06	.3	K .56	.41	63.3	62.0	A27
9	87	30	-.03	.32	1.06	.3	1.10	.4	L .43	.41	73.3	64.6	A9
8	88	30	-.13	.32	.96	-.1	.98	.0	M .30	.41	66.7	65.5	A8
17	87	30	-.03	.32	.91	-.2	.84	-.5	N .55	.41	76.7	64.6	A17
4	81	30	.54	.30	.89	-.3	.87	-.4	O .55	.42	70.0	58.6	A4
7	85	30	.17	.31	.84	-.5	.89	-.3	o .20	.41	66.7	62.0	A7
12	86	30	.07	.31	.82	-.6	.85	-.5	n .55	.41	60.0	62.9	A12
3	74	30	1.13	.28	.83	-.7	.81	-.7	m .46	.44	60.0	54.6	A3
6	94	30	-.78	.34	.79	-.7	.82	-.6	l .30	.40	66.7	67.0	A6
1	89	30	-.24	.32	.81	-.6	.80	-.6	k .38	.41	70.0	66.2	A1
29	101	30	-1.60	.35	.78	-.9	.75	-1.0	j .55	.38	70.0	64.3	A29
14	75	30	1.05	.29	.75	-1.1	.75	-1.0	i .56	.44	70.0	54.8	A14
10	99	30	-1.36	.34	.74	-1.0	.73	-1.1	h .50	.39	80.0	65.4	A10
25	89	30	-.24	.32	.71	-1.0	.73	-.9	g .48	.41	70.0	66.2	A25
15	91	30	-.45	.33	.69	-1.1	.71	-1.1	f .33	.41	70.0	67.2	A15
13	89	30	-.24	.32	.68	-1.2	.68	-1.2	e .51	.41	63.3	66.2	A13
19	93	30	-.67	.33	.65	-1.3	.64	-1.4	d .58	.41	70.0	67.3	A19
5	91	30	-.45	.33	.61	-1.5	.61	-1.5	c .44	.41	76.7	67.2	A5
30	90	30	-.34	.33	.60	-1.5	.59	-1.6	b .72	.41	73.3	66.8	A30
28	92	30	-.56	.33	.50	-2.0	.49	-2.1	a .67	.41	80.0	67.3	A28
MEAN	86.2	30.0	.00	.31	.99	-.1	1.00	.0			63.6	62.6	
S.D.	7.7	.0	.75	.02	.35	1.3	.37	1.3			11.5	4.8	

+TABLE 10.3 C:\Users\ASUS\Documents\DATA WINSTEP\ ZOU403WS.TXT Feb 6 20:07 2022
INPUT: 30 Person 30 Item REPORTED: 30 Person 30 Item 4 CATS WINSTEPS 3.73

Figure 1. Item Fit output on Winstep

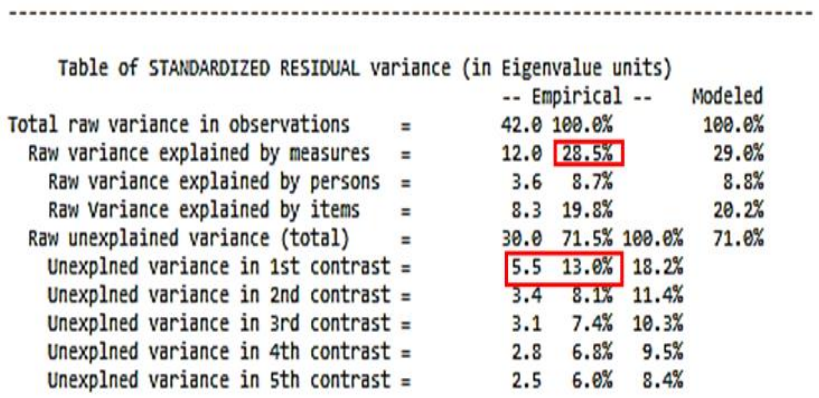


Table of STANDARDIZED RESIDUAL variance (in Eigenvalue units)

		-- Empirical --		Modeled
Total raw variance in observations	=	42.0	100.0%	100.0%
Raw variance explained by measures	=	12.0	28.5%	29.0%
Raw variance explained by persons	=	3.6	8.7%	8.8%
Raw Variance explained by items	=	8.3	19.8%	20.2%
Raw unexplained variance (total)	=	30.0	71.5% 100.0%	71.0%
Unexplned variance in 1st contrast	=	5.5	13.0% 18.2%	
Unexplned variance in 2nd contrast	=	3.4	8.1% 11.4%	
Unexplned variance in 3rd contrast	=	3.1	7.4% 10.3%	
Unexplned variance in 4th contrast	=	2.8	6.8% 9.5%	
Unexplned variance in 5th contrast	=	2.5	6.0% 8.4%	

Figure 2. Output Item Dimensionality on Winstep

Test Results for Map Variables

Based on the output of the item map, it displays the ability of the respondent and the level of difficulty of the items made on the same scale. It can be seen clearly in Figure 3 that there are 20 items above the zero line and the remaining 10 are below the zero line. Items above the zero line indicate items that are difficult to approve, while those below zero indicate items that are easy to approve. For A22, it has the highest level of difficulty or is difficult for respondents to agree on, item A22 itself cannot measure the respondents on the scale well, it can also be seen that the separation value is quite low. As for item A29, it is the item that is easiest for respondents to agree with.

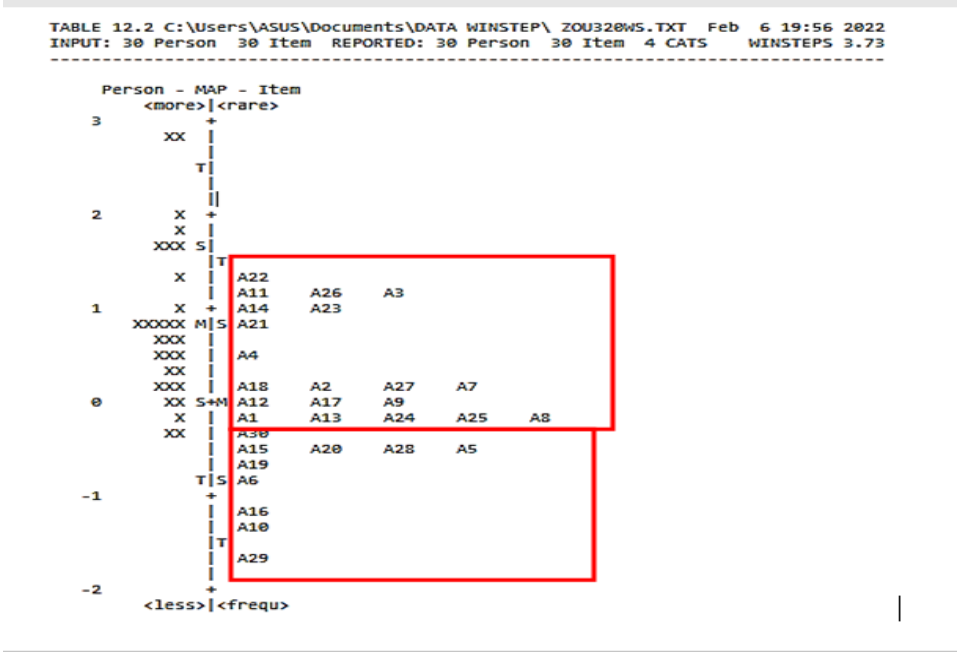


Figure 3. Output Item Map on Winstep

Rating Scale Test Results

Based on the test using the output rating scale, which is to see whether the validity of the instrument item can be understood by the respondents well with the criteria for the peak of each scale (rating). So, as shown in the category measure, the value increases consistently, this means that the rating scale functions well from -0.42, -0.07, -0.89, 1.94. This shows that respondents who have an ability of -0.42 will tend to answer strongly disagree (score 1), respondents who have an ability of -0.42 will tend to answer strongly disagree (score 1). ability -0.07 will tend to answer

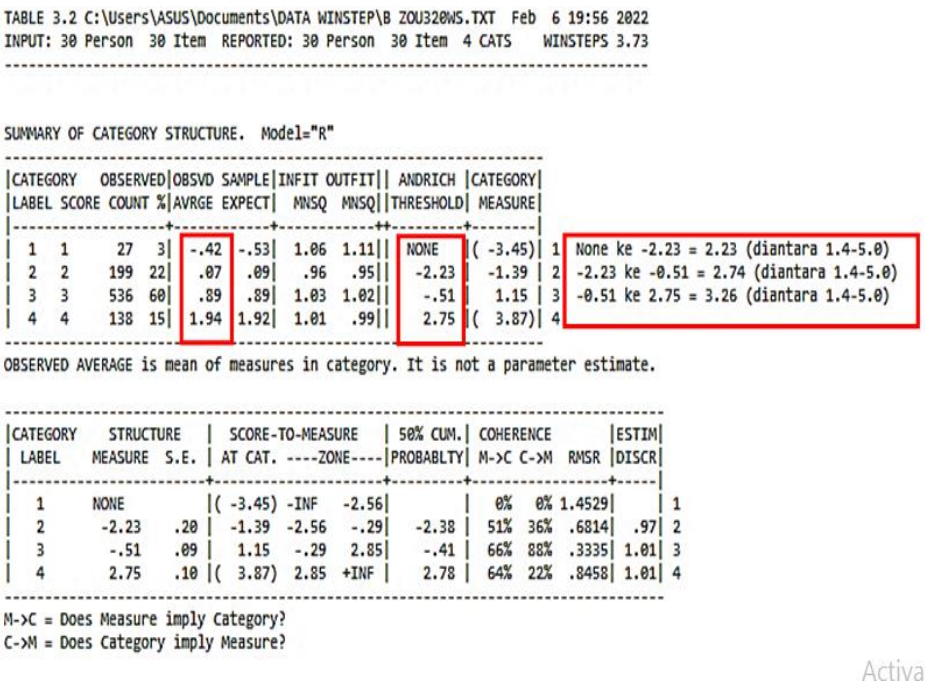


Figure 4. Output Rating Scale on Winstep

disagree (score 2), respondents who have ability -0.89 will tend to answer agree (score 3), respondents who have ability 1.94 will tend to answer strongly agree (score 4). This increases with the level of ability of the respondents. However, that alone is not enough to see the validity of the instrument, so it is necessary to look again at the criteria for the Andrich Threeshold value index.

Item Reliability Test Results and Respondents

Based on the results of the output of Summary Statistics, the average value of respondents in the instrument is 0.83. The average value higher than logit 0.0 indicates the tendency of respondents who answered strongly agree on the item statement. For the value of person reliability, 0.82 is included in the very good category because it is between 0.80-0.90 and item reliability 0.80 is included in the very good category because it is right at 0.80. it can be concluded that the consistency of the answers of the respondents and the quality of the items in the instrument is very high. The Cronbach's alpha value of 0.84 is included in a good level because it is above 0.8

SUMMARY OF 30 MEASURED Person

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	86.2	30.0	.83	.31	1.01	-.2	1.00	-.3
S.D.	8.0	.0	.83	.02	.54	2.0	.53	2.0
MAX.	105.0	30.0	2.89	.36	2.15	3.2	2.11	3.1
MIN.	74.0	30.0	-.31	.29	.30	-3.4	.27	-3.6

REAL RMSE	.35	TRUE SD	.75	SEPARATION	2.15	Person RELIABILITY	.82
MODEL RMSE	.32	TRUE SD	.76	SEPARATION	2.43	Person RELIABILITY	.85
S.E. OF Person MEAN = .15							

Person RAW SCORE-TO-MEASURE CORRELATION = 1.00
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .84

SUMMARY OF 30 MEASURED Item

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	86.2	30.0	.00	.31	.99	-.1	1.00	.0
S.D.	7.7	.0	.75	.02	.35	1.3	.37	1.3
MAX.	101.0	30.0	1.37	.35	1.90	3.0	2.01	3.2
MIN.	71.0	30.0	-1.60	.28	.50	-2.0	.49	-2.1

REAL RMSE	.33	TRUE SD	.68	SEPARATION	2.02	Item RELIABILITY	.80
MODEL RMSE	.32	TRUE SD	.68	SEPARATION	2.17	Item RELIABILITY	.82
S.E. OF Item MEAN = .14							

UMEAN=.0000 USCALE=1.0000
Item RAW SCORE-TO-MEASURE CORRELATION = -1.00
900 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 1550.60 with 839 d.f. p=.0000
Global Root-Mean-Square Residual (excluding extreme scores): .5847

Figure 5. Output Summary Statistics on Winstep

Questionnaire Results of Perception Indicators of Understanding or Understanding of Objects and Interview Results

The questionnaire uses a likert scale. Likert scale is a research scale used to measure attitudes and opinions, this scale is used to complete a questionnaire which requires respondents to indicate their level of agreement with a series of questions.

The level of agreement in question is a likert scale of 1-5 choices, with gradations from Strongly Agree (SS), Agree (S), Doubtful (RG), Disagree (TS) and Strongly

Disagree (STS). The gradations used in this questionnaire are Strongly Agree (SS), Agree (S), Disagree (TS) and Strongly Disagree (SS).

Questionnaire Results of Perception Indicators Understanding or Understanding of Objects and Student Interview Results A1

The results of the questionnaire filled out by A1 students based on indicators of perception of understanding or understanding of objects are presented in Table 1. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) better understand and understand the material being taught; b) prefer to learn calculations c) master the material being taught; d) study physics material first; e) unable to master the physics material which is quite difficult; f) feel that they do not understand when taking notes; g) learn to complete the practice of physics problems; h) mastering theory and calculation; i) summarizing important material in physics learning; j) more detailed and easy to understand.

Table 1. Student Questionnaire A1 on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand and understand the material being taught better.	S
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	SS
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	S
5	I can master physics material which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	TS
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete physics exercises sent by the teacher through the classroom and whatsapp applications.	S
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	TS
9	I summarized the important material in physics learning contained in the videos sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A1 students seen from the perception indicators show that: a) understand and understand; b) enjoy learning calculations; c) master the material; d) have studied physics material; e) unable to master difficult physics material; f) do not understand; g) complete the practice of physics problems by yourself; h) mastering theory as well as calculations; i) summarizing the material; j) more detailed and easy to understand.

Results of Questionnaire Indicators of Perception Understanding or Understanding of Objects and Student Interview Results A2

The results of the questionnaire filled out by A2 students based on indicators of perception of understanding or understanding of objects are presented in Table 2. Based on the questionnaire assessment on the indicator of perception of understanding or understanding of the object shows that: a) understand the material being taught better; b) enjoy learning calculations; c) master the material; d) studying physics material; e) mastering physics material; f) do not understand; g) complete physics exercises; h) mastering theory rather than calculation; i) summarizing the material; j) more detailed and easy to understand.

Table 2. A2 Student Questionnaire on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand the material being taught better.	SS
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and WhatsApp applications, I can answer them because I have mastered the physics material that has been taught.	S
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	SS
5	I can master physics material which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	S
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete physics exercises sent by the teacher through the classroom and whatsapp applications.	SS
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	S
9	I summarized the important material in physics learning contained in the video sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A2 students seen from the perception indicators show that: a) understand the material; b) enjoy learning; c) master the material; d) studying physics material; e) mastering physics material; f) do not understand; g) completing physics assignments; h) mastering theory rather than calculation; i) summarizing the material; j) more detailed and easy to understand.

Questionnaire Results of Perception Indicators Understanding or Understanding of Objects and Student Interview Results A3

The results of the questionnaire filled out by A3 students based on indicators of perception of understanding or understanding of objects are presented in Table 3. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics material; e) mastering physics material; f) do not understand; g) complete the practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Table 3. A3 Student Questionnaire on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand and understand the material being taught better.	S
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	SS
4	Before the teacher taught physics material through the classroom and whatsapp applications, I had studied the material first.	S
5	I can master physics material which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	TS
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete physics exercises sent by the teacher through the classroom and whatsapp applications.	S
8	Through the classroom and WhatsApp applications, I have more control over theory compared to calculations in physics learning.	TS
9	I summarized the important material in physics learning contained in the videos sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and WhatsApp applications.	SS

The results of interviews conducted with A3 students seen from the perception indicators show that: a) understand and understand physics material; b) enjoy learning; c) master the material; d) studying physics material; e) unable to master the material; f) do not understand; g) complete the practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Results of Questionnaire Indicators of Perception Understanding or Understanding of Objects and Student Interview Results A4

The results of the questionnaire filled out by A4 students based on indicators of perception of understanding or understanding of objects are presented in Table 4. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics; e) mastering the material of physics; f) do not understand; g) complete the practice of physics problems; h) mastering theory; i) summarizing; j) more detailed and easy to understand.

Table 4. A4 Student Questionnaire on Indicators of Perception of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand and understand the material being taught better.	SS
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and WhatsApp applications, I can answer them because I have mastered the physics material that has been taught.	S
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	SS
5	I can master physics which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	S
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete the physics practice questions sent by the teacher through the classroom and whatsapp applications.	SS
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	S
9	I summarized the important material in physics learning contained in the video sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A4 students seen from the perception indicators show that: a) understand and understand the material; b) enjoy learning; c) master the material; d) studying physics; e) master the material; f) do not understand; g) completing physics assignments; h) mastering theory rather than calculation; i) summarizing the material; j) more detailed and easy to understand.

Questionnaire Results of Perception Indicator Understanding or Understanding of Objects and Student Interview Results A5

The results of the questionnaire filled out by A5 students based on indicators of perception of understanding or understanding of objects are presented in Table 5. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics; e) mastering the material of physics; f) do not understand; g) completing practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Table 5. A5 Student Questionnaire on Indicators of Perception of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications, I better understand and understand the material being taught.	S
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	SS
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	S
5	I can master physics material which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	TS
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete the physics practice questions sent by the teacher through the classroom and whatsapp applications.	S
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	TS
9	I summarized the important material in physics learning contained in the video sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A5 students seen from the perception indicators show that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics; e) mastering the material of physics; f) do not understand; g) completing practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Questionnaire Results of Perception Indicators Understanding or Understanding of Objects and Student Interview Results A6

The results of the questionnaire filled out by A6 students based on indicators of perception of understanding or understanding of objects are presented in Table 6. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics; e) mastering the material of physics; f) do not understand; g) complete the practice of physics problems; h) mastering theory; i) summarizing the material; j) more detailed easy to understand.

Table 6. A6 Student Questionnaire on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications, I better understand and understand the material being taught.	SS
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	SS
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	S
5	I can master physics material which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	S
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	Saya belajar menyelesaikan latihan soal fisika yang dikirim oleh guru melalui aplikasi classroom dan whatsapp.	S
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	TS
9	I summarized the important material in physics learning contained in the videos sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A6 students seen from the perception indicators show that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics material; e) mastering physics material; f) do not understand; g) complete the practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Questionnaire Results of Perception Indicator Understanding or Understanding of Objects and Student Interview Results A7

The results of the questionnaire filled out by A7 students based on indicators of perception of understanding or understanding of objects are presented in Table 7. Based on the questionnaire assessment on indicators of perception of understanding or understanding of objects, it shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics; e) mastering the material of physics; f) do not understand; g) completing practice questions; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Table 7. A7 Student Questionnaire on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand and understand the material being taught better.	S
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	S
4	Before the teacher taught physics material through the classroom and WhatsApp applications, I had studied the material first.	SS
5	I can master physics which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	TS
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete the physics practice questions sent by the teacher through the classroom and whatsapp applications.	SS
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	TS
9	I summarized the important material in physics learning contained in the video sent by the teacher through the classroom and whatsapp applications so that I better understand the material.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A7 students seen from the perception indicators show that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics material; e) unable to master the material; f) do not understand; h) mastering theory and calculation; i) summarizing the material; j) more detailed and easy to understand.

Questionnaire Results of Perception Indicator Understanding or Understanding of Objects and Student Interview Results A8

The results of the questionnaire filled out by A7 students based on indicators of perception of understanding or understanding of objects are presented in Table 8. Based on the questionnaire assessment on the indicator of perception of understanding or understanding of the object shows that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics material; e) mastering physics material; f) do not understand; g) complete the practice questions; h) mastering theory; i) summarizing the material; j) more detailed and easy to understand.

Table 8. A8 Student Questionnaire on Perception Indicators of Understanding or Understanding of Objects

No	Question	Response
1	By using the classroom and whatsapp applications I understand and understand the material being taught better.	SS
2	By using the classroom and whatsapp applications, I prefer to learn calculation material in physics learning.	S
3	When the teacher asks questions through the classroom and whatsapp applications, I can answer because I have mastered the physics material that has been taught.	S
4	Before the teacher taught physics material through the classroom and whatsapp applications, I had studied the material first.	SS
5	I can master physics which is quite difficult when the teacher sends more interesting learning videos through the classroom and whatsapp applications.	TS
6	Through the classroom and whatsapp applications, I don't understand when I only take notes without explaining it first.	S
7	I learned to complete the physics practice questions sent by the teacher through the classroom and whatsapp applications.	SS
8	Through the classroom and whatsapp applications, I mastered theory more than calculations in physics learning.	S
9	I summarize the important material in physics learning contained in the video sent by the teacher via the classroom and whatsapp applications so that I understand the material better.	SS
10	I understand better when the teacher gives a more detailed and easy-to-understand explanation through the classroom and whatsapp applications.	SS

The results of interviews conducted with A8 students seen from the perception indicators show that: a) understand and understand; b) enjoy learning; c) master the material; d) studying physics material; e) unable to master the material; f) do not understand; g) completing physics assignments; h) mastering theory rather than calculation; i) summarizing the material; j) more detailed and easy to understand.

Based on the research questionnaire on research subjects, students A1 to A8 feel happy and helped by online learning applications such as Google Classroom and WhatsApp because using the Google Classroom and WhatsApp applications can make it easier for students in the learning process during a pandemic, the Google Classroom application and also WhatsApp does not make students feel difficult in understanding the material taught by the teacher and does not make students feel bored in learning to use online learning applications during the pandemic.

4. Conclusion

Based on the description of the results that have been disclosed, it can be concluded that students' perceptions of online learning using the classroom and whatsap applications can help students and not make students difficult in the learning process during the pandemic in class XI IPA 1 SMA Negeri 1 Tapa

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