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The Effect of Using Rock Type Classification Comparator Board Media In Contextual Learning on Geography Learning Outcomes Of Class X at SMAN 22 Surabaya

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ABSTRACT: This study investigates the impact of using rock type classification comparator board media in contextual learning on the geography learning outcomes of grade X students at SMAN 22 Surabaya. The research employed a quantitative descriptive approach with a quasi-experimental design, involving pre-tests and post-tests for experimental and control groups. Data were collected through observations, questionnaires, and test instruments. The validity and reliability of the research instruments were confirmed through Cronbach's Alpha values exceeding 0.6. Results indicate that the use of comparator board media significantly enhances student learning outcomes in terms of cognitive, affective, and psychomotor aspects. The Mann-Whitney Test revealed a significant difference between pre-test and post-test scores (p < 0.05), while the Spearman Rank Correlation showed varied results, with positive correlations in the affective aspect (0.611) and negative correlations in cognitive (-0.146) and psychomotor (-0.087) aspects. Despite the high cost of the media being a limitation, the tool's functionality and its ability to foster collaborative learning make it effective in improving student engagement and understanding of lithosphere materials. This study highlights the importance of innovative teaching tools in enhancing learning outcomes.

Keywords: contextual learning, comparator board media, geography learning, lithosphere, learning outcomes, student engagement

INTRODUCTION

Teaching materials are everything used by educators in carrying out teaching and learning activities. In the Law on Teachers and Lecturers Number 14 of 2005 Article 8, an educator is required to be able to develop a learning curriculum, carry out educational and learning activities, develop learning materials and utilize information and communication technology in terms of learning (Magdalena, Sundari, Nurkamilah, Nasrullah, & Amalia, 2020). Referring to the Law, teachers must be equipped with several positive competencies such as pedagogical, personality, social and professional. In teaching and learning activities, teaching materials play an important role as a driver of teachers' creativity in delivering lessons. On the other hand, teaching materials can also stimulate student motivation in learning activities. The existence of teaching materials and learning delivery methods has a great impact on student learning outcomes. This is proven in many studies conducted by experts regarding the correlation between teaching materials and learning outcomes (Nurwidayanti & Mukminan,

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2018). Every subject that the teacher wants to convey to students, everything comes from teaching materials. According to some experts, teaching materials need to be developed periodically in a contextual manner. This is recommended so that the teaching and learning process carried out by educators and students does not feel boring. Monotonous learning certainly has a bad impact on student development (Adi & Masruri, 2017).

One of the many subjects or subjects, Social Sciences or abbreviated as Social Sciences is a subject or subject that is considered boring. This is because teachers are too monotonous in delivering learning. Apart from the fact that the teaching materials used are less effective, the learning method conveyed by the teacher is only carried out in one direction. It is not uncommon for students to consider that social studies subjects or subjects are subjects that have a lot of lectures. This is because students are not given space to interact and explore freely about the things that have been conveyed by teachers in social studies subjects (Rustono & Lidinillah, 2020).

Factually speaking, this was found at SMA Negeri 22 Surabaya. Students of SMA Negeri 22 Surabaya expressed their boredom with less enthusiastic behavior during teaching and learning activities. Based on the teacher's observations, the enthusiasm of students decreases when Geography lessons with lithosphere material are given (Djafar, Akolo, Pratama, & Stat, 2024). The decrease in student enthusiasm was accompanied by obvious signs such as drowsiness, lack of focus, lack of concentration, and other signs that showed the lack of activity of students in receiving lithosphere material in social studies Geography learning. At SMA Negeri 22 Surabaya, so far the teaching materials used in delivering lithosphere material in social studies Geography learning are still relatively conventional where teachers provide lessons based on package books, power points and posters. The learning method conveyed is still classified as one-way where the teacher explains and the student listens. The responsibility in teaching and learning is still fully held by teachers. As a result, students lack interest in learning independently (Hamzah & Hartoto, 2016).

Lithosphere material in the subject of Geography is closely related to knowledge of various types of rocks on the earth's surface. Some social studies teachers of SMA Negeri 22 Surabaya assume that the decline in students' interest in lithosphere learning is due to the difficulty of students understanding and identifying different types of rocks (Muhtar, Nugraha, & Giyartini, 2020). Thus, it is necessary to innovate teaching materials to increase students' interest and learning outcomes. An innovation in teaching materials that can be done by teachers in providing Geography learning about the lithosphere is to use the media of a rock type comparator board. A rock type comparator board is a medium that displays images and complete information about various types of rocks on earth. This media can help students in studying, comparing, and understanding the characteristics of each rock that makes up the lithosphere (Nurfadhillah, Ningsih, Ramadhania, & Sifa, 2021).

The existence of a comparator board media can support the learning process of students to understand the types of rocks that form the earth's surface. On the other hand, students can also compare and identify different types of rocks that exist visually. Students can actively make direct observations of lithosphere forming rock samples. With the help of comparator board media, teachers strive to package the teaching materials into contextually interesting learning methods. Contextual is a learning approach that focuses on the relationship between learning materials and real situations or contexts in the environment around students (Yuberti, 2014). The existence of media assistance in the form of a rock-type comparator board is expected to improve student learning outcomes in terms of cognitive, affective and psychomotor in geography subjects, especially lithosphere material.

Therefore, in this study, the researcher wants to prove empirically whether the media of the rock type comparator board and the contextual learning method can have an influence on student learning outcomes. Based on the research concept that has been explained, the researcher determined "The Effect Of The Use Of Rock Type Comparator Board Media In Contextual Learning On The Learning Outcomes Of Geography Class X AT SMAN 22 Surabaya" as the research title.

RESEARCH METHODOLOGY

The type of research that will be carried out is quantitative descriptive research, where the researcher will describe the data that has been measured mathematically based on the results that have been obtained from the distribution of questionnaires. The data that has been obtained will be mapped based on the variables to be tested in the study consisting of independent variables and dependent variables (Sunaengsih, 2016). This research will be designed as accurately as possible with the aim of revealing a causality regarding the influence of the use of learning media. In its application, this research will be carried out using the quasi experiment method. The quasi experiment method is a method to manipulate variables in a certain way to affect other variables that are being measured. In the quasi experiment, a control group and an experimental group will be determined to test the pre-test and post-test. Conceptually, the design of the quasi experiment method refers to the following table:

Table 1. Quasi Experiment Method Design

	_	<u> </u>	
Class X	Pre-test	Treatment	Post-test
Experiment	Y1	Χ	Y2
Control	Y3	Χ	Y4

Source: Primary Data 2023

The accuracy of the research design will be based on the concept of Matching Pre-test – Post-test Comparison Group Design with a treatment to reveal the initial state or phenomenon before the change attempt and the subsequent state or phenomenon after the change or after use. The treatment will be equated in the state before and after on an apple-to-apple basis.

The data used in this study will be divided into two categories, namely primary and secondary data. Primary data is data obtained directly based on observations in the scope of research. On the other hand, secondary data is data obtained indirectly through a bridge or link, either individually or through media that contains information that can support the things being researched (Chan et al., 2019). Primary data was obtained by direct observation. Technically, primary data can be obtained through an observation supported by the distribution of questionnaires or questionnaires. Secondary data can be retrieved through an intermediary in the form of books, reports, literacy, videos or other articles.

In the trial of research instruments, all data obtained will be measured for the validity and reliability of the data. The validity test serves to test the validity of the data that has been obtained. The purpose of the validity test is to find out whether the research instrument is able to accurately measure the variables being studied. Research can be said to be legitimate if the results that appear show similarities in the existence of data collected with the actual phenomenon in the object that has been studied. On the other hand, to find out the extent to which the measurement is reliable or consistent if the variable is measured repeatedly, a reliability test will be used (Yusup, 2018).

In this case, the validity test will be carried out by comparing r calculations to r tables. If the calculated r is valued greater than the table r value, then the data obtained can be said

to be legitimate. However, if the calculated r value is smaller than the table r value, then the data obtained is not substantial. Meanwhile, the reliability test, the research instrument can be said to be reliable if the Cronbach's Alpha value is above 0.6 (>0.6) Both trials of this research instrument will be carried out using application software in the form of SPSS.

RESULT AND DISCUSSION

Result

Review Tools

Based on the values that have been given by the validator regarding the tool review, the calculation of the results obtained is as follows:

Table 2. Tool Review Assessment Results Per Category

		(Total Value / Total	
Total	Total Max	Value Max) *	
Value	Value	100%	Interpretation
29	45	64%	Tools fit to use
15	16	94%	The tool is very worthy of use
19	20	95%	The tool is very worthy of use
6	10	60%	Less suitable tools for use
69	100	69%	Tools fit to use
	Value 29 15 19	Value Value 29 45 15 16 19 20 6 10	Total Total Max Value Max) * Value Value 100% 29 45 64% 15 16 94% 19 20 95% 6 10 60%

Source: Primary Data (2024)

Based on the table above, it can be understood that all categories of functionality, visuals, and flexibility of the tool obtained good grades or in other words, the functionality, visuals, and flexibility of this comparator board are worthy of being used in lithosphere learning. But on the other hand, economically, this comparator board is not feasible to use. This is because the price of the tool in the form of a comparator board is quite expensive when equated with its function. Although there is one category that is assessed by validators or experts as not suitable for use, overall this comparator board is still feasible to use with a final score of 69% and does not limit the functionality of the tool in supporting the learning of lithospheric material in schools.

Validity and Reliability Test

At this stage, all the scores that have been recapped and calculated based on each aspect as presented in Appendix 3 to Appendix 8, will be tested for their overall validity, both pre-test and post test scores. With the results of the calculations obtained, the validity and reliability tests displayed for each aspect at the pre test and post test stages are as follows:

Cognitive Aspects

The results of the validity test of the cognitive aspect of the pre-test stage are as follows:

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		Pis Test Registrati	Prefield Expose by	Fro Task magnite Col.	Pro-Tool (cognitrius	PATES Registrati	Pro Test requireds	Pris Total Registrar	PricTold Alegode GB	PscTest respection	Pra Tipol Regraterant	Fre Test Regalit TOTAL
Fire Tell Engrill DT	Promot Convilled	1	-378	376	.134	300	346	330	584	.596	028	610
HOWELOW THE	Tig (Freed)	5.23	080	881	320	gat.	310	00	408	306	268	. 23
	March Street	TE:		70	78	79	781	71	70	Te	79	7.9
Prin Trief Knightlif DJ.	Plantos Consultino	3187	14.	.826	216	334	218	+100	375	362	326	255
	Sig (21sted)	000		890	.000	085	\$70	008	881	809	.004	.00
	No.	12	79	70	78	76	-70	71	.70	TIE.	72	7.7
Fre Telli Kalgraff D.K.	Pearson Consider	315	528"	- 1	298	258	.784	194	348	.135	.218	625
	34 (Dated	700	.099	203	300	.091	821	.100	842	266	0.78	:60
	94	38)	79.		- 078	70	70	:11	. 70.	76	38	
Pre-Treat tragnet Cal	Painter Consultin	334	.556	3390	. 1	195	716	.734	.,160	241	.185	.515
	Sty (Control)	.27%	,062	300		100	1305	-961	186	304	-135	
	(4)	110	79	70	11	70	70	- 23	70	.16	28	17
Pro-Transcriptorics	Page 23 standard	361	\$316	259	1100	.Y.	815	300	341	.109	282	.019
	39 (7/s/e)	211	3005	331	104		830	011	881	.304	.054	30
	88	187	75	10	76	76	10	- 11	70	76	11	1.3
Pri Teat Kegner GC	Finnes Contains	185	238	364	111	125	1	.01	183	007	178	(4)
	79 (7/(0+5	3111	3079	877	300	090		001	204	300	307	31
	11	11	79	70	11	79	10	- 11	10	10	19	- 7
Pra-Text Regritt QT	Ferrior Consistent	136	444	194	.279	.906	310	9.	381	282	233	666
	99.175999	:047	1099	. 100	.001	0/2	801		300	\$29	-014	30
	94	19	.79	76	16	16	(1)	-71	10	ye	19	19
Phy Trini Expret GE	Feature Durystan	316	375	:30	107	367	302	1960	(9)	336	218	.000
	Rig (200HB)	413	.001	840	166	160	334	000		.901	002	
	N	111	99.	707	76	70	70	:71	70	16	74	10
Pris Trail EnginEP 08	Priority Consulting	190	362	125	341	185	-307	287	336	1.4	- 415	411
	Sig (250mg	TON	089	388	.014	383	376	0.19	785		009	.01
	44	. 78	79	36	710	76.	76	319	76	76	76	119
THE THEIR PROPERTY IS	Printing Committee	316	136	210	166	292	:518	230	211	415	1.8	557
	Big (District)	809	089	370	121	043	321	(2)4	822	100	1 13	81
	W	307	74	70	78	74	70	71	70	70		1.5
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	Try (2-talled)	906	.089	300	366	089	1996	-004	380	300	.000	
	44	76	-79	70		20	10	771	70	70	23	1

Figure 1. Results of the Validity Test of Cognitive Aspects in the Pre-Test Stage Source: Primary Data (2024)

As for the results of the validity test of the cognitive aspect of the post test stage, they are as follows:

		Provided Programmed	Prortess rispent 0.2	Postteel Acardoos	PostTest Rogert GR	Post task Karpite Ot	Postfield Regarding	Post Tirel Hispograf	PostTest Regard GS	PristTeel ragostros	PostTirel RogistF010	Fret Fam Family TOTAL
FINETINETING WEST	FAMOR CHEMBON		382	296	387	311		391		386	285	51:5
	ling (Distalled)	200	216	077	.829	039	. 879	182	396	391	.013	287
	M		170	76	76	79	79	79	76	74	70	70
Post Event regret III	Pasekos convention	252	1	.296	445	395	762	.442	.903	365	232	640
	Sig (24shell)	.516	ned.	013	806	695	196	000	846	842	.954	390
	M Comment	. 78	76	78	78.0	170	78	75	- 19	70	72	79
Foat Teet Kog WED	Process Consumor:	796	244	- 1	810	ARY	799	337	310	368	.812	480
	Sq. Chlarkett	.019	213		800		324	200.0	801	391	900	1990
	N	78	70	76	381	70	18:	70	78	70	.78	.70
Post: Fact Folgreit D4	First Coredon:	360	460	300	1	.062	:216	354	392	2001	AW:	440
	Fig Clothid	031	800	.080		080	10	390	316	238	300	100
	N	29:	10	21	19	.71	10	79	19	Po	76	190
POM THREE DESIGNATION	Painter Consulting	. 20C:	325	.000	.802	104	314	185	3010	296	.000	690
	Rig. (2-fabbil)	.003	300	000	302		801	3001	900	.010	800	300
	N	28	116	79	110	79	18	.70	18	30	.116	70
PLACTORITOW/PLOS	Province Colleges	Offi	111		230	374	- 1.	387	385	255	.303	.00
	Fig. Charect	809	196	COLN	-107	1911		201	311	2019	908	289
	36	79	70	70	- 10	70	76.1	70	TV	76	79.	70
FrontTeermagner (2)	Patenta Correspon	(1)11	410	200	1119	2017	.267	- 1	0004	417	200	643
	By District	142	800	064	300	081	801		800	.005	813	.000
	16	73	70	70	179	70	10	70	10	19	71	70
Post Teet trap #FTDS:	PANNERS CONVIDEN	7/1	693	10.7	292	1,450.7	296	414	1.0	440	794	787
	Fig. (2496)(6)	1000	.800	001	164	080	313	.080	1 100	.080	311	.000
	4	7.0	te	70	10	70	70	70	. 75	19	.76	10
Pret Test hoget 20	Firstor Consider	.700	358	37.1	1800	.391	.285	452	.046	1	364	881
	Fig. (Cristina)	.062	,832	(81	794	005	583	590	8.0		300	595
	No.	72	16	28	70	:76	1.76	2,79	- 10	70	16	70
PostTeethogostTUTE	Existing Deletation	295	230	457	316	.440	313	297	295	.395	9.	.080
	By Crising	.013	953	089	301	.083	508	2013	313	.060	55	.000
	H	. 29	78	20	3,791		78	26	11/	70	. 18	70
PARTHUMETTONAL	PROFEST COLUMNS	391	645	2002	549	191	.603	.50	700	491	.000	i i
	in Drains	3000	100	.093	800	.000	.600	2000	8.0	100	.000	
	AL.	26:	76	.74	13	22	16	20	38	30	76	70

Figure 2. Results of the Validity Test of Cognitive Aspects of the Post Test Stage Source: Primary Data (2024)

From the two figures above (figure 6 and figure 7), the cognitive aspect has been tested for validity in each treatment, namely pre test and post test. Based on the two figures above, it can be concluded with the simple table below which contains a summary of each validity test result on each question number.

Table 3. Summary of Cognitive Aspect Validity Test Results Pre Test and Post Test Stage

	Pre Test			Post Test		
	Correlati	Sig 5%		Correlation	Sig 5%	
Question	on Value	(r table)	Ket.	Value	(r table)	Ket.
	(r calculate)			(r calculate)		
Q1	0.610	0.232	Valid	0.515	0.232	Valid
Q2	0.755	0.232	Valid	0.649	0.232	Valid
Q3	0.625	0.232	Valid	0.680	0.232	Valid
Q4	0.515	0.232	Valid	0.549	0.232	Valid
Q5	0.615	0.232	Valid	0.698	0.232	Valid
Q6	0.540	0.232	Valid	0.502	0.232	Valid
Q7	0.615	0.232	Valid	0.643	0.232	Valid
Q8	0.586	0.232	Valid	0.702	0.232	Valid
Q9	0.491	0.232	Valid	0.681	0.232	Valid
Q10	0.552	0.232	Valid	0.686	0.232	Valid
TOTAL	1	0.232	Valid	1	0.232	Valid

Source: Primary Data (2024)

Based on the table above, the overall correlation value or r calculation that appears is greater (>) than the r value of the table with an error significance of 5% in the number of samples that have been determined as many as 70. So that all questions contained in the cognitive aspect research instrument sheet are declared valid. With the results of the data that are declared valid, a reliability test is then carried out to determine the extent of the reliability of the research instrument in obtaining consistent results if the research instrument is repeated or used in the same operation.

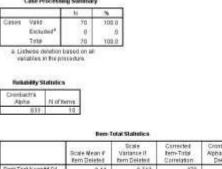
The results of the reliability test of the cognitive aspect of the pre-test stage are as follows:

		N	
Cases Valu		70	1000
Enck	ded.	0.5	
Total		70	100.0
parusiks	in the pr		
variables	in the pr	scedure	
parusiks	in the pr	scedure	15

	Rest.	Total Statistics		
	Scale Mountif flom Deleted	Scale Variance if Item Dateted	Contested Barro-Total Correlations	Cronbach's Alpha Citorn Beletes
Pre-Testikognitif Of	2.67	5.934	.474	371
Pre Test Kognitt G2	286	5.776	.674	741
Pre Test Kogner Q1	288	5 900	493	761
Pre Test Kognill Q4	2.71	6.207	304	.781
Pre Test Kognitif Q5	280	8.017	493	361
Pre Testirogner Ge	2.77	6.179	299	791
Pre Test Kognitif Q7	2,80	0.017	493	791
Pre Test Hognitif Oil	2.73	6.027	450	374
Pre-Teet Kognitif DN	2.90	0.439	369	791
Pre-Test Kogner Q18	2.84	6.221	426	371

Figure 3. Results of the Cognitive Aspect Reliability Test in the Pre-Test Stage Source: Primary Data (2024)

As for the results of the reliability test of the cognitive aspects of the post test stage, they are:



Post rest riogratius	0.44	0.743	315	832
PostTest Kognitt 02	0.44	6.395	538	81.6
Post Test Kings #F G3	6.34	0.499	590	812
PostTeetKognitt 04	6.29	0.003	452	.024
FostTest tograff 08:	0.61	0.195	591	811
Post Test Rognat 06	0.26	7.063	409	821
PostTest HognEFGF	il dt.	0.448	533	318
Post Test Hogs at 09	6.50	6.194	397	.818
PostTestHogn#FD9	8.50	0.254	570	013
PostTestKogs#f010	W.59	0.188	572	.813

Figure 4. Results of the Cognitive Aspect Reliability Test at the Post Test Stage Source: Primary Data (2024)

Based on Figure 8 and Figure 9 above in the Reliability Statistics dialog box, it can be seen that the Cronbach's Alpha value that appears in the cognitive aspect of the pre-test stage is 0.791 and in the cognitive aspect of the post-test stage is 0.833. From the data, it can be concluded that the two values are greater than the reliability standard of Cronbach's Alpha value, which is 0.6. Thus, 0.791>0.6 and 0.833>0.6 can be stated that the two cognitive aspect research instruments in the pre test and post test stages are declared reliable and can be used in the same situation repeatedly.

Affective Aspects

The results of the validity test of the affective aspect of the pre-test stage are as follows:

					Chin	Lafrance		and the second				
	- 27	Fre-Twel ANNE D1	Pre Text Medical	Pro Test Albert (13	Pre-Text AMM/04	PricTitals AlVARITOD	Pos Teats about Ge	Pro Test Aspect or	Por Text West Dit	Fre Test: WARTON	Fin-Test Minerolli	PreTest ANUMETODIAL
Pre-Transhistral	Fearant Deletifics	- 1	201	203	.007	411	274	31(101	3817	sta	ARE
	59.0 WHE:		3000	333	OUT	(810)	- 006	810	008	100	308	300
	10	76	79	10	24	70	- 79	70	.71	FU	- 11	70
Pts Test Mineral	Printer Consister	321	00	391	381	300	211	130	200	487	262	310
	NU CHANG	300		:407	190	.839	1006	800	000	800	:015	390
	11	10	. 11	76	78	10.3	79	70	39	10	79	.00
PHI THE ASSESSED.	Person Constitute:	27.2	2001	. 1	1477	446		310	384	.436	318	.000
	Sq G Miles	113	460	5.53	268	800	063	300	000	830	3007	360
	H	70	75	70	79	70	73	70	- 71	70	79	70
Pre-Tree: Ament ISE	Practice Contention	317	265	411	100	533	- 625	.190	280	310	366	201
	SQ CHINE	801	.001	250	180	840	006	.000	416	880	(80)	.000
	10	70	71	70	. 21	70.1		70	- 31	-70	78	70
Pre Teat Resolution	Pearson Correlation	481	389	446	.511	1	517	470	453	381	508	796
	56.0 bleb	800	009	800	009	(0)	.004	390	des	890	904	.000
	11	to	.78	.76	. 39	. 10	- 31	70		no.	78	70
Pre-Test Weet Gill	Everyon Contribution	379	200	359	415	577	1.8	835	ATE	3499.5	441	890
	59.12-le/e8	901	001	800	0.009	890		890	006	1890	306	180
	.16	10	76	10	. 21	70.	71	P0:	- 11	TO:	79	.70
Pre-Test Asset GT	Peartie Constitution	. 811	2010	316	143	170	40.	.17	817	304	404	791
	59.0946	800	200	206	238	830	000		008	890	3006	360
	H .	10	241	110	76	70	210	100	- 11	100	18	10
Pre-Transhietras	- Export Cooking	824	. 343	306	198	410	416	307	- 1	DV.	526	316
	56 DWNE	100	(000	90I	011	(800)	000	880		825	3006	100
	11	10	79	16	74	79	70	70	-71	PO-	19	70
PINTHM APPRITOR	Printer Consister	#CT	SART	435	213	501	(0000)	524	-318	1	878	334
	No. Charles	900	3008	300	2006	300	000	800	906	-	1008	360
	H .	70	74	76	74	10.1	7.8	70	71		34	10
PH THE MINISTER.	Private Document	416	2008	370	368	990	+41	450	121	.476		210
	Re-CHINE	300	3011	802	200	800	1004	850	008	890		180
	#	70	79	70	78	70	71	70	71	70	TW.	70
FIR THE MINET TITLE.	Practice Contention -	676	587	906	. 189	7.00	1084	700	1054	334	142	- 7
	Sig-CF Miled	900	(9.8	800	.046	880	004	800	004	883	(000)	(2)
	#	10	73.	76	-78	70	- 28	70	21	70	78	79

Figure 5. Results of the Validity Test of Affective Aspects of the Pre Test Stage Source: Primary Data (2024)

As for the results of the validity test of the affective aspect of the post test stage, they are as follows:

					Com	Labora						
		PostTest Westrott	Past Test Muster 0.2	Post First Allent 0.3	ProtTest Awist of	First Test; Allert 25	Poer Tirel . All-Mide	First Test Medit Co	Finite Tyres absect our	PostTest Analysis	Part Test.	Proxition .
Post Type Aldel III	Fearture Constitute		-880	547		.100	100	301	200	.074	10	710
	94.12 HHE		1900	300	000	810	000	100	311	0000	100	100
	31	11	76	.74	.11	70	.79	76	70	79	78	10
PARTHORNING!	Feiren Coorne	/581	9.	745	300	136	0.000	421	420	1893	817	3031
	865-C216/W/B	300		380	608	800	000	900	280	2008	.800	345
	.11	76	.79.	76	716	70.	.73	100	70	78	. 78	70
PLATFIELDING GT	Pearson Convenien	597	7.00	1	862	114	1000	.455	1992	1406	676	1801
	No. Charles	266	800	100	904	800	.090	800	200	049	306	(94)
	W. Williams	76	70	78.	.78	70.	79	TE	70	71	76	70
Free Tires Revot GR	Pearson Convenier	079	0.80475	882		504	842	.807	910	474	916	.830
	5672496	300	800	387	100	250	199	800	300	day	806	383
	34	78	70	78	- 20	2.70		78	70	. 78	10	70
Post Test Alaint Q1	Francis Consister:	188	836	.046	304	- 1	884	308	890	467	576	387
	Pat2Web	.008	300	.089	908		.080	800	285	.008	300	.280
	11	78		24		. 10	7.8	. 70	70		76	
PHI THE WARRIEST	Printing Covered in	368	300	583	190	.000	200	.903	341	299	672	37%
	No. (7 talks)	2008	900	299	508	890		900	890	Oten.	300	360
	16	74	20	70.	(T)	70	29	18.	70	200	76	70
Practive medicin	Printer Constitution	401	426	485	463	300	463	3.0	921	386	492	304
	THE COMMISS	381	800	2001	000	890	080		220	(81	400	890
	11	TI	TO	74	- 11	70.	76	116	10	71	10.	
Peak Teat RONGS GIV.	Francis Convention	387	428	910	223	460	241	127	- 11	276	1390	875
	Sty. (2-849-9	:001	800	.000	(808.	800	000	906		2008	300	660
	H	71.	705	70.1	(1)	10	78	TI.	.70	71	70	70
Freit Fest Abenit G1:	Porten Condition:	404	1300	4.00	416	3417	184	316	214		546	191
	56 C N95	-006	800	1000	900	850	090	801	200		.006	390
	34	71	76	70 4	18	10	7.9	76	-70	78.	16	75
Pres Tres Water Q10	President Contraction	193	.07	676	-944	390	478	460	.836	200	1.4	381
	50,03990	008	800	2003	908	800	083	800	290	1,000	523	880
	N. Contraction	26	10	70.	31	70	19	38	26	71	78	20
PHATHERWARETOTIS.	Palesin Corollini	163	827	421"	806	797	178	204	825	.898	787	
	99 (2 tares	:000	800	1000	908	800	099	300	190	100	900	F 50
	W	76	70	- 24	-78	70	71	18	720	78	76	70

Figure 6. Results of the Validity Test of the Affective Aspect of the Post Test Stage
Source: Primary Data (2024)

From the two images above (figure 10 and figure 11), the affective aspect has been tested for validity in each treatment, namely pre test and post test. Based on the two figures above, it can be concluded with the simple table below which contains a summary of each validity test result on each question number.

Table 4. Summary of Validity Test Results of Affective Aspects of Pre Test and Post
Test Stages

	. 250	Stages			
F	re Test		Po	st Test	
Correlation	Sig 5%	Kot	Correlation	Sig 5%	Ket.
(r calculate)	(i table)	Ket.	(r calculate)	(i table)	Net.
0.675	0.232	Valid	0.763	0.232	Valid
0.583	0.232	Valid	0.827	0.232	Valid
0.606	0.232	Valid	0.821	0.232	Valid
0.651	0.232	Valid	0.800	0.232	Valid
0.746	0.232	Valid	0.797	0.232	Valid
0.696	0.232	Valid	0.778	0.232	Valid
0.706	0.232	Valid	0.694	0.232	Valid
0.654	0.232	Valid	0.675	0.232	Valid
0.804	0.232	Valid	0.699	0.232	Valid
0.762	0.232	Valid	0.787	0.232	Valid
1	0.232	Valid	1	0.232	Valid
	Correlation Value (r calculate) 0.675 0.583 0.606 0.651 0.746 0.696 0.706 0.654 0.804	Correlation Sig 5% Value (r table) (r calculate) 0.675 0.583 0.232 0.606 0.232 0.651 0.232 0.746 0.232 0.706 0.232 0.706 0.232 0.654 0.232 0.804 0.232 0.762 0.232	Pre Test Correlation Value (r table) Sig 5% (r table) Ket. (r calculate) 0.232 Valid 0.583 0.232 Valid 0.606 0.232 Valid 0.651 0.232 Valid 0.746 0.232 Valid 0.796 0.232 Valid 0.654 0.232 Valid 0.804 0.232 Valid 0.762 0.232 Valid	Pre Test Po Correlation Value Sig 5% (r table) Ket. Value (r calculate) (r calculate) (r calculate) (r calculate) 0.675 0.232 Valid 0.763 0.583 0.232 Valid 0.827 0.606 0.232 Valid 0.821 0.651 0.232 Valid 0.797 0.696 0.232 Valid 0.778 0.706 0.232 Valid 0.694 0.654 0.232 Valid 0.675 0.804 0.232 Valid 0.699 0.762 0.232 Valid 0.787	Pre Test Post Test Correlation Value (r table) Sig 5% (r table) Ket. Value (r table) (r table) (r calculate) 0.675 0.232 Valid 0.763 0.232 0.583 0.232 Valid 0.827 0.232 0.606 0.232 Valid 0.821 0.232 0.651 0.232 Valid 0.800 0.232 0.746 0.232 Valid 0.797 0.232 0.696 0.232 Valid 0.778 0.232 0.706 0.232 Valid 0.694 0.232 0.654 0.232 Valid 0.675 0.232 0.804 0.232 Valid 0.699 0.232 0.762 0.232 Valid 0.787 0.232

Source: Primary Data (2024)

Based on the table above, the overall correlation value or r calculation that appears is greater (>) than the r value of the table with an error significance of 5% in the number of samples that have been determined as many as 70. So that all questions contained in the affective aspect research instrument sheet are declared valid. With the results of the data that

are declared valid, a reliability test is then carried out to determine the extent of the reliability of the research instrument in obtaining consistent results if the research instrument is repeated or used in the same operation.

The results of the reliability test of the affective aspect of the pre-test stage are as follows

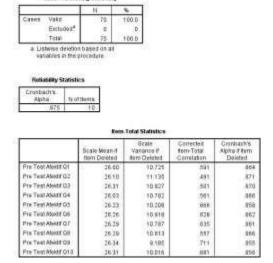


Figure 7. Results of the Reliability Test of Affective Aspects of the Pre Test Stage Source: Primary Data (2024)

As for the results of the reliability test of the cognitive aspects of the post test stage, they are:

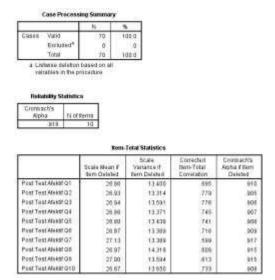


Figure 8. Results of the Reliability Test of Affective Aspects of the Pre Test Stage Source: Primary Data (2024)

Based on Figure 12 and Figure 13 above in the Reliability Statistics dialog box, it can be seen that the Cronbach's Alpha value that appears in the affective aspect of the pre-test stage is 0.875 and in the affective aspect of the post-test stage is 0.918. From the data, it can be concluded that the two values are greater than the reliability standard of Cronbach's Alpha value, which is 0.6. Thus, 0.875>0.6 and 0.918>0.6 can be stated that the two sheets of research instruments on the affective aspect of the pre test and post test stages are declared reliable and can be used in the same situation repeatedly.

Psychomotor Aspects

The results of the validity test of the psychomotor aspect of the pre-test stage are as follows:

					Correl	MINOR IN						
		Pro Test Protections	Pro-Test Palkovisost 02.	Pre Test Publisheder 103	Printer Palicentair bit	Pie Test Psiconcter Idl	Printers Printers 06	PleTest Palcorate 01	Parties Parkiness OK	Parted Patentier 04	PARCENERS CHR	Paintable Psikuriahe 200AL
Pre-Teat/Pelkomonici()	Portor Consistor	7	815	768	PM.	198	1917	100	216	100	917	.407
	EN IDISHME	930	306	00k	-006	308	.009	008	:009	,099	.069	1090
	N.	10	78	31.	20			79	2.0	76	7.0	74
Pris Teld Palesteriote: 07	Prompty Consider.	(83%)		1754	204	.794	903	749	937	.084	932	334
	Sign (2/talwid)	308	1,520	308	7006	.009	.008	.009	.000	069	.000	.061
	16	. 71	78	78	76	71	76	. 71	79	. 33	79	. 70
Pre Test Paliconster Q1	Pageure Consistent	. File	258	78	719	.004	121	300	141	945	TVE	.907
	Mig. Christiani	308	908		1008	309	008	003	2008	069	7001	061
	H.	29	14	Oy.	. 16	28	796	74	. 14	74	. An	74
Pro Test Principality G.E.	PERMIT CANDOO	57975	804	758		704	171	367	004	2408.5	585	385
	Sig Chalvell	800	304	668		006	-004	.088	3006	.066	.099	3,044
	11	- 11	11	71	11	31	- 11	111	11		- 11	
Pre Test Psecrote: 01.	FAMILIA CONTRACT	57940	768	80Y	TUR	0.90	266	46.7	961	043	195	974
	Self-Charlest	.000	300	909	3006		3000	- 200	2000	700	380	7000
	11	38	76	76	76	38	14	28	34	78	. 14	74
PHETAMESHOCKER INC.	PHICKOR SHIPHORDS	794	103	1725	778		10	:839	401	.088	The	1014
	Sig. 12/billion	604	-016	906	200	900	55.9	365	.008	662	.089	642
	H	71	76	18	78	78	78	73	78	70	70	70
Pri Test Palicannia: 67	Payrace Lovelable	1297	245	218	-867	362	935	040	974	394	174	379
	Reg 12/Garnett	308	308	308	318	365	200	100	1985	.068	2005	
	H	78.	18	. 11	78	21	78		7.38	. 72	74	90
Pro Test Paleonicile (ET	Product Consider	336	837	743	.004	= t	801	379	- 1	883	1989	201
	thy Cristotic	304	909	-809	,000	304	300	200		1,000	1000	1,040
	H	. 71	79	71	- 19	71	79	79	74	79.	70	. 70
Pra Test Pallintonio Q0	Finance Consistor	.010	664	.643	407	807	90	.000	(10)	21	907	.730
	No (Frates)	100	.006	300	300	368	.004	.008	.000		200	.060
	11	311	76	316	716	316	74	31	74.	19.	34	31
FIETHMPANCENER UTC	Prince Centions	911	811	197	516	118	714	110	191	1000	- 1	391
	Dy.Onlett	800	- 006	AVE.	-006	900	.006	-000	.009	.000		- 041
	11	79	11	75	71	75	21	75	79	79	239	
Pro TestPlanorscale	Eversor Contrator:	465	674	817	862	3016	971	978	601	0.7887	981	
TOTAL	NA COMME	306	908	304	908	30#	001	368	.001	343	2000	88
	Home	10	100	78.	71	710	79	300	100	28	76	21

Figure 9. Results of the Validity Test of Psychomotor Aspects in the Pre Test Stage Source: Primary Data (2024)

Meanwhile, the results of the psychomotor aspect validity test in the post test stage are as follows:

					Cornel	risiona						
		Prof Test Palkomoter Of	Park Test Palkomoter 02	Parel Tirel Paikomoter 0.7	Post Tirel Palkomoter 04	Post Tirel Palkomoter DS	Post Tirst Palkometer 06	Post Test Pallometer 07	Post Test Paliconeter 08	Post Test Paliconster 09	PostTest Palkometer 010	Post Test Paliconeur TOTAL
Post Test Psikorsotor Gf	Pearson Convistion		.462	.368	.528	.512	.418"	.465	.369	.466	.389	.113
	540,12/58/6/0		.000	.002	.000	.008	.000	.000	.001	.000	.009	.000
	H	71	71	71	71	71	71	79	70	70	70	70
Post Tost Pakoreotoi Q2	Pearson Constation	.463		.301	302	.395	.423	.379	.365	.390	.201	.613
	Sig. (2-tailed)	908		.011	.011	.001	.008	.002	.002	.001	.095	.000
	N	71	71	71	71	71	71	71	70	70	70	70
Post Test Palkomotor GG	Pearson Constation	368	.301	1	, ince	.595	.460	.447"	.535	390	329	.722
	540,1249446	.002	.011		.000	.000	.000	.000	.000	.003	.005	.000
	H	71	71	28	71	71	78	28	20	70	70	70
Post Tost Psikoreotoi Q4	Pearson Corelation	.526	302	.708		.604	.460	.302	.434	.435	.337	.729
	Sig. (2-tailed)	904	011	.008		.008	.008	1007	.000	.000	.084	.080
	N	71	71	71	71	71	71	71	70	70	70	70
Post Test Psikomotor Q5	Pearson Correlation	810	316	.596	.604		.598"	.423"	.460	.335	.223	.747
	54, (2446)	.000	.001	.000	.000		.000	.000	.000	.005	.003	.000
	H	71	71	21	71	71	28	20	20	20	70	70
Post Test Psikorkotol G6	Pearson Constation	.411	.423	.460	.461	.596	1	.568	.542	.484	.369	.752
	Sig. (2-tailed)	000	908	.008	.008	.008		.000	.000	.000	.082	.000
	N	71	71	71	71	71	71	71	70	70	70	70
Peat Test Palksmotor 07	Pearson Correlation	465	371	-447	.302	.473"	.648"	1	.629	.584	.456	.726
	54, (24444)	.000	.002	.000	.007	.008	.000		.000	.000	.000	.000
	N	71	71	71	71	71	28	28	70	79	70	70
Post Test Psikomotol G8	Pearson Constation	.209	.368	.536	.424	.461	.542	.529	1	.585	.454	.740
	Sig. (2-tailed)	gon	902	.008	.008	.008	.008	.000		.080	.080	.083
	N	71	71	71	71	71	71	71	70	70	70	70
Peat Test Palkomotor GS	Pearson Corwistion	418	.388	.962	415	-335	484"	-584	.585	1	-633	.726
	84L(254H)	.000	.001	.003	.000	.005	.000	.000	.000		.000	.000
	N	71	78	71	71	71	28	28	20	70	70	70
Post Test Palkomotor	Pearson Constation	.309	.201	.329	.337	.223	.259	.456	.454	.610	1	.590
010	Sig. (2-failed)	009	.016	.005	.004	.063	.002	.008	.000	.080		.083
	N	71	71	71	71	71	71	71	70	70	70	70
Post Test Psikoreolos	Pearson Corelation	213	-613	.732**	.728	.747**	.762	.726	.740	.726"	.690	- 1
TOTAL	840.12/04/60	.000	.000	.000	.008	.008	.000	.000	.000	.000	.000	
	H	71	71	71	71	21	21	20	39	20	20	70

Figure 10. Results of the Psychomotor Aspect Validity Test at the Post Test Stage
Source: Primary Data (2024)

From the two figures above (figure 14 and figure 15), the psychomotor aspect has been tested for validity in each treatment, namely pre test and post test. Based on the two figures above, it can be concluded with the simple table below which contains a summary of each validity test result on each question number.

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Table 5. Summary of Psychomotor Aspect Validity Test Results Pre Test and Post Test

		3	tage			
	Pre Test Post Test				ost Test	
	Correlation	Sig 5%		Correlation	Sig 5%	
Question	Value	(r table)	Ket.	Value	(r table)	Ket.
	(r calculate)			(r calculate)		
Q1	0.922	0.232	Valid	0.713	0.232	Valid
Q2	0.934	0.232	Valid	0.613	0.232	Valid
Q3	0.857	0.232	Valid	0.722	0.232	Valid
Q4	0.857	0.232	Valid	0.728	0.232	Valid
Q5	0.914	0.232	Valid	0.747	0.232	Valid
Q6	0.914	0.232	Valid	0.752	0.232	Valid
Q7	0.878	0.232	Valid	0.726	0.232	Valid
Q8	0.931	0.232	Valid	0.740	0.232	Valid
Q9	0.733	0.232	Valid	0.726	0.232	Valid
Q10	0.891	0.232	Valid	0.590	0.232	Valid
TOTAL	1	0.232	Valid	1	0.232	Valid

Source: Primary Data (2024)

Based on the table above, the overall correlation value or r calculation that appears is greater (>) than the r value of the table with an error significance of 5% in the number of samples that have been determined as many as 70. So that all questions contained in the psychomotor aspect research instrument sheet are declared valid. With the results of the data that are declared valid, a reliability test is then carried out to determine the extent of the reliability of the research instrument in obtaining consistent results if the research instrument is repeated or used in the same operation.

The results of the reliability test of the psychomotor aspect of the pre-test stage are as follows:

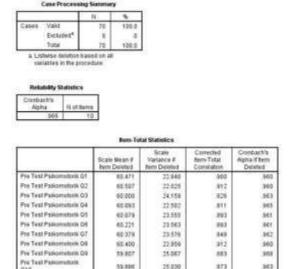


Figure 11. Results of the Reliability Test of Psychomotor Aspects of the Pre Test Stage

Source: Primary Data (2024)

Meanwhile, the results of the reliability test of the psychomotor aspect of the post test stage are:

Case Processing Summary

		(8)	.%	1		
Cases Val	H	70	100.0	1		
Ex	turted*	0		1		
To	(a)	70	1000	l.		
	e deletion ba e in the proc			-		
Reliability	Statistics					
Crompon's	h laws	71 0				
Alpha	Notiten	-				
. 90	5	D.				
			Hem-To	tal Statistics		
			Mean if Deleted	Scale Variance if Item Deleted	Corrected favor-Total Correlation	Cronbach's Apna if tem Deleted
Post Test Pa	Nametus Q1		71.70	12.764	.816	875
Post Test Ps	ikamatar 02	1	71.93	13,343	.495	,895
Post Test Ps	Remotor 03	2	71.84	13.062	.639	973
Post Test Ps	ixemeter 04	1	71.90	13.164	.653	872
Post Test Ps	iliamotar 05		71.96	12916	872	870
Post Test Pa	itemeter Off	1	21.97	12.927	677	,676
Post Test Ps	memeter 07		71.90	13.496	459	972
Post Test Ps	Romotor Oil	4	71.83	13159	866	871
Post Test Ps	Hamotor OB		71.77	13.512	859	872
PostTestPs Q10	Hamotor		71.89	13.929	495	192

Figure 12. Results of the Psychomotor Aspect Reliability Test at the Post Test Stage

Source: Primary Data (2024)

Based on Figure 16 and Figure 17 above in the Reliability Statistics dialog box, it can be seen that the value of Cronbach's Alpha that appears in the psychomotor aspect of the pretest stage is 0.966 and in the psychomotor aspect of the post-test stage is 0.885. From the data, it can be concluded that the two values are greater than the reliability standard of Cronbach's Alpha value, which is 0.6. Thus, 0.966>0.6 and 0.885>0.6 can be stated that the two sheets of psychomotor aspect research instruments in the pre test and post test stages are declared reliable and can be used in the same situation repeatedly.

Normality Test

Based on the results of the total value of each aspect in each sample that has been determined, both at the pre test and post test stages as shown in appendix 9, then a normality test is carried out to determine the distribution of the data that has been collected, whether the data is normally distributed or abnormal. This normality test will focus on the significance value of Shapiro Wilk, due to the number of samples <100. The results of the normality test obtained are as follows:

		16313 0	i Normanty				
	Kelas	Kolmo	gorov-Smiri	nov ^a	SI	napiro-Wilk	
		Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar Siswa	Total Pre Test	.133	70	.004	.892	70	.000
	Total Post Test	.154	70	.000	.930	70	.001

a. Lilliefors Significance Correction

Figure 13. Shapiro Wilk Normality Test Results

Source: Primary Data (2024)

With the value or level of significance shown in the figure above, precisely in the Shapiro Wilk column, it can be seen that the data is abnormally distributed with a significance value below 0.05 (sig < 0.05). In accordance with the abnormal distribution of the data, the next series of analysis can still be carried out using a series of non-parametric statistical tests.

Mann Whitney Test

To clarify the results of the normality test that have been obtained as shown in figure 18, precisely in the Shapiro Wilk column which is based on the total value of the entire aspect as shown in appendix 9 and to answer the question that has been set in the formulation of the first problem, the results of the Mann Whitney non-parametric statistical test that appear are as follows:

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Ranks						
	Kelas	N	Mean Rank	Sum of Ranks		
Hasil Belajar Siswa	Total Pre Test	70	45.04	3152.50		
	Total Post Test	70	95.96	6717.50		
	Total	140				

	atist	

	Hasil Belajar Siswa
Mann-Whitney ∪	667.500
Wilcoxon W	3152.500
Z	-7.429
Asymp. Sig. (2-tailed)	.000

Figure 14. Mann Whitney Non-Parametric Statistical Test Results

Source: Primary Data (2024)

With a significance level of 5% and with the data used, the mean result of the total pre test was 45.04 with a sum of ranks 3152.50 and the mean result of the total post test was 95.96 with a sum of ranks 6717.50. The comparison between each of the two values can be said to be very significant with a large difference in value comparison. On the other hand, in the test statistics table, it can be seen that the indigo Asymp. Sig. (2-tailed) is 0.000 or below 0.05 (0.000<0.05). Thus, it can be concluded that there is a significant difference between the total score of the pre test and the total score of the post test.

Spearman Rank Correlation Test

To prove in detail the significant difference between the pre test and the post test, an advanced statistical test was carried out using the Spearman Rank Correlation Test both in total on the results of the pre test and post test scores as well as on each aspect (cognitive, affective and psychomotor). The Spearman Rank Correlation test is carried out to answer the questions that have been set in the formulation of the second problem with the following three objectives:

- 1. Looking at the level of correlation between the two pre-test and post-test variables both in total and in each aspect.
- 2. Looking at the direction of the correlation of the two pre-test and post test variables in total and in each aspect.
- 3. Looking at the level of significance of the relationship between the two pre-test and post-test variables in total and in each aspect.

The results of the Spearman Rank Correlation Test obtained in total at the Pre Test and Post Test stages are as follows:

Total Overall Aspect (Average)

Correlations

			Total Pre Test	Total Post Test
Spearman's rho	Total Pre Test	Correlation Coefficient	1.000	.098
		Sig. (2-tailed)	Xc.	.420
		N	70	70
	Total Post Test	Correlation Coefficient	.098	1.000
		Sig. (2-tailed)	.420	ï
		N	70	70

Figure 15. Spearman Rank Correlation Test Results Based on the Average Total Pre
Test and Post Test

Source: Primary Data (2024)

With the above data, it can be known that:

a. The total pre test and post test scores have a very weak correlation level with pre test and post test scores of 0.098

- b. The direction of the relationship between the two pre-test and post-test variables as a whole (total) showed a positive value of 0.098. This is because the total pre-test score has experienced a considerable increase in the post test score.
- c. The relationship between the two pre-test and post-test variables in total has a significant effect as the value that appears is 0.098.

This statement is consistent with the guideline table or reference used by the Spearman Range Correlation statistical test as shown in table 5.

Cognitive Aspects

Correlations

			Pre Test Kognitif	Post Test Kognitif
Spearman's rho	Pre Test Kognitif	Correlation Coefficient	1.000	146
		Sig. (2-tailed)	80	.229
		N	70	70
	Post Test Kognitif	Correlation Coefficient	146	1.000
		Sig. (2-tailed)	.229	
		N	70	70

Figure 16. Results of the Spearman Rank Correlation Test Based on the Total Pre Test and Post Test Scores on Cognitive Aspects

Source: Primary Data (2024)

With the above data, it can be known that:

- d. The total pre-test and post-test scores have a very, very weak negative correlation level with pre-test and post-test scores of -0.146.
- e. The direction of the relationship between the two pre-test and post test variables as a whole (total) showed a negative value of -0.146. This is because the total pre-test score has decreased in the post test score.
- f. The relationship between the two pre-test and post test variables in total did not have a significant effect as the value appeared at -0.146.

This statement is consistent with the guideline table or reference used by the Spearman Range Correlation statistical test as shown in table 5.

Affective Aspects

Correlations

			Pre Test Afektif	Post Test Afektif
Spearman's rho	Pre Test Afektif	Correlation Coefficient	1.000	.611**
		Sig. (2-tailed)	60	.000
		N	70	70
	Post Test Afektif	Correlation Coefficient	.611**	1.000
		Sig. (2-tailed)	.000	26
		N	70	70

^{**.} Correlation is significant at the 0.01 level (2-tailed).

Figure 17. Results of the Spearman Rank Correlation Test Based on the Total Pre Test and Post Test Scores on the Affective Aspect

Source: Primary Data (2024)

With the above data, it can be known that:

- g. The total pre test and post test scores had a moderate or sufficient correlation level with pre test and post test scores of 0.611
- h. The direction of the relationship between the two pre-test and post-test variables as a whole (total) showed a positive value of 0.611. This is because the total value is moderate

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- or sufficient, it can be said that if a value higher than one variable tends to be related to a higher value than another variable or with another interpretation, a value lower than one variable tends to be related to a lower value than another variable both at the pretest stage and the post-test stage.
- i. The relationship between the two pre-test and post-test variables in total has an average effect (moderate) as the value of 0.611 is in line with the statement that **Correlation is significant at the 0.01 level (2-tailed).

This statement is consistent with the guideline table or reference used by the Spearman Range Correlation statistical test as shown in table 5.

Psychomotor Aspects

Correlations

			Pre Test Psikomotorik	Post Test Psikomotorik
Spearman's rho	Pre Test Psikomotorik	Correlation Coefficient	1.000	087
		Sig. (2-tailed)	60	.475
		N	70	70
	Post Test Psikomotorik	Correlation Coefficient	087	1.000
		Sig. (2-tailed)	.475	1
		N	70	70

Figure 18. Results of the Spearman Rank Correlation Test Based on the Total Pre Test and Post Test Scores on the Psychomotor Aspect

Source: Primary Data (2024)

With the above data, it can be known that:

- j. The total pre-test and post-test scores had a very weak negative correlation level with pre-test and post-test scores of -0.087.
- k. The direction of the relationship between the two pre-test and post test variables as a whole (total) showed a negative value of -0.087. This is because the total pre-test score has decreased in the post test score.
- I. The relationship between the two pre-test and post-test variables in total did not have a significant effect as the value appeared at -0.087.

This statement is consistent with the guideline table or reference used by the Spearman Range Correlation statistical test as shown in table 5.

Discussion

Based on the results obtained in sub chapter 1, it can be seen that there is one category of tool assessment (tool review) that is declared unsuitable for use, namely the price category or economic level of the tool. The appointed experts agreed that the price of an aid in the form of a comparator board is quite expensive. It is considered that the tool in the form of a comparator board can actually be redesigned and remade as simple as possible without compromising the functionality of the tool. There are so many aspects or factors that can be designed or remade, such as one of them is the main basic material of the board in the comparator tool. The basic material of the board can be made using simple materials such as plastic or wood with low quality so that the comparator board tool can be reached by students, more economical and affordable.

With the existing price (priced) and with a less feasible assessment, but the comparator board can still be used in learning, it's just that the procurement of tools used for learning is a little limited where one tool in the form of a comparator board is used jointly by several groups (students). Limited procurement of tools can actually also have many positive impacts such as:

- 1. Collaboration: Learning together collaboratively allows fellow students or fellow learners to be able to solve problems and understand the material well. Collaboration allows for the exchange of ideas and thoughts that can enrich the understanding of all students.
- 2. Experience Exchange: Each student has a different experience and understanding of the tools used. By learning together, students share and exchange experiences and knowledge to help enrich collective understanding.
- 3. Developing Social Skills: Learning together allows students to interact directly with other study peers. This can indirectly develop social skills, such as the ability to communicate, collaborate, and adapt to group situations.
- 4. Increases Motivation: Learning collectively can increase motivation because it is enriched with support and encouragement from fellow students or fellow learners. A sense of involvement and commitment in a group can also increase motivation to learn.
- 5. Broadening Perspectives: Learning with other students makes it possible to hear different viewpoints and approaches to the material. This can help in broadening perspectives and understanding of the topic being studied.
- 6. Building Teamwork Skills: Learning by using tools together is a good exercise for building teamwork skills, which are indispensable in a variety of contexts, both in the workplace and in collaborative projects (Rahma, et al., 2023).

Thus, a less significant assessment of the entire assessment category does not mean that the existence of an aid is not meant to be maximized, or in other words, a poor assessment of a tool does not necessarily mean that the tool does not function at all (Arif, 2007). What strengthens this statement is due to the small number of factors assessed from the economic category and the small number of reviewers (validators).

With the existing comparator board aids, and a series of learning activities carried out, the comparator board aids were declared to have a positive and significant effect on the learning outcomes of grade X students of SMA Negeri 22 Surabaya as shown by the output of Uji Mann Whitney. Meanwhile, the Spearman Rank Correlation Test makes it clear that overall the results obtained in the pre test and post test results give a correlation value of 0.098 with a very weak interpretation. This is due to the influence of outliers that are able to affect the correlation value of the Spearman Rank Correlation Test based on the weaknesses of the data used in the analysis. Outlier is a data value that has a far greater comparison than the average or median of the data. If this happens, then the value raised in the Spearman rank Correlation Test can be high or even low as the output obtained in this study because the data does not have a normal distribution (Sugiyono, 2020).

Evaluatively, the learning outcomes of grade X students of SMA Negeri 22 Surabaya produced quite varied outputs based on the state of data distribution. For example, in the cognitive aspect, the Spearman Rank Correlation Test indicates a very, very weak negative score at the correlation level of the pre-test and post-test stages with a correlation value of -0.146. Furthermore, in the affective value, the output produced is also quite varied, but in this case the correlation level at the pre-test and post-test stages indicates a fairly positive value with a correlation of 0.611. Meanwhile, in the psychomotor aspect, it produces a low negative value at a very weak correlation level with a correlation value of -0.087. The overall variation in grades that appear in each aspect is due to several obstacles experienced by students, both comprehension (cognitive) obstacles in students' academics and technical obstacles caused by the situation at school.

Some of the technical obstacles that occur at school when students work on pre-test and post-test research instruments are as follows:

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- 1. Students receive guidance from BK (Counseling Guidance) teachers on the sidelines of working on research instruments so that students cannot complete one or all aspects at the pre test or post test stages.
- 2. Students receive guidance from the organizers of school activity competitions on the sidelines of working on research instruments so that students cannot complete one or all aspects at the pre test or post test stages.
- 3. Students are in a state of unfitness or lack of health on the sidelines of working on pretest and post-test research instruments.

Of the above technical obstacles that occur in tandem or on the sidelines of the work of research instruments, of course it can affect a significant decrease or increase in value as shown in the negative results of the Spearman Rank Correlation Test. In this case, the Spearman Rank Correlation Test produces one aspect with a positive correlation on the interpretation of the sufficient and two aspects with a negative correlation on the interpretation of the very weak. Positive results are caused because two variables (pre test and post test) have rank values that increase at the same time while negative results are caused because both variables (pre test and post test) have rank values that do not increase or even decrease (Firdaus, Nashiroh, & Djuniadi, 2020). Negative results are reasonable results that are not caused by data errors, these results appear because there is an opposite relationship between the variables tested which is caused by several technical obstacles that occur in schools when working on pre-test and post test research instruments as well as differences in the academic level of students in working on pre-test and post test research instruments.

CONCLUSION

The research concludes that the use of rock type classification comparator board media in contextual learning positively impacts the learning outcomes of grade X students at SMA Negeri 22 Surabaya, as evidenced by the significant differences in pre-test and post-test scores shown in the Mann-Whitney Test and further clarified by the Spearman Rank Correlation Test, which yielded a very weak correlation value of 0.098. The evaluation of learning outcomes before and after using the contextual learning approach shows varied results. In the affective aspect, there is a positive correlation with a Spearman Rank Correlation value of 0.611, indicating a one-way increase in the tested variables. However, in the cognitive and psychomotor aspects, the correlation values are negative (-0.146 and -0.087, respectively), reflecting a decrease in the tested variables. This variation highlights the differing impacts of the contextual learning media on various aspects of student learning.

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