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ANALYSIS OF THE EFFECTIVENESS OF DIFFERENTIATED LEARNING IN IMPLEMENTING AN INDEPENDENT CURRICULUM ON STUDENT LEARNING OUTCOMES IN LIMA PULUH KOTA INDONESIA

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Abstract

This research aims to see the effectiveness of differentiated learning in implementing the independent curriculum on the learning outcomes of state high school students in Limapuluh Kota Regency. The research was conducted at the Limapuluh Kota District High School with research data sources from basic educational data from SMA 1 and SMA 2 Harau, as well as data from the Central Statistics Agency (BPS) and the Limapuluh Kota Regency Education Office. This research uses Ordinary Least Squares (OLS) multiple linear regression data analysis techniques. The results of the research show that the implementation of learning styles has not significantly influenced learning outcomes, but other X variables, namely teacher competence, school environment, and student personality (IQ and gender), have an influence on student learning outcomes. Meanwhile, students' sociodemographic factors do not influence learning outcomes in certain subjects. The competency of driving teachers influences mathematics learning outcomes and Indonesian language learning outcomes. Apart from that, the boarding school environment also influences student learning outcomes in Indonesian language subjects, economic subjects, and arts and culture subjects. Student personal factors related to the IQ variable also influence student learning outcomes, with a difference in scores of 0.22 in mathematics subjects and 0.18 in economics subjects. Meanwhile, the gender variable influences economic learning outcomes with a score difference of 58.62, where female students have a higher score of 58.62 than male students.

Keywords: Effectiveness, Differentiation, Implemetation, Learning Style

INTRODUCTION

Assessment of high school (SMA) student learning outcomes in implementing the Merdeka Belajar curriculum is needed to find effectiveness and sustainability in the learning process, which can be better adapted to individual student needs and abilities. Good learning outcomes play an important role in shaping the future of secondary school (SMA) students, providing them with a strong foundation for achieving success in their personal and professional lives (Agustin et al., 2020). The learning outcomes obtained by high school students have various significant benefits for their development and future (Marpaung, 2016). Several reasons why learning outcomes are important in implementing the Independent Curriculum are to obtain evaluation of the learning process, feedback for improvements, monitoring student progress, determining the success of the curriculum, and determining educational standards. At least the main goal of the Merdeka Curriculum for high school students is to provide diverse, relevant, and interesting learning experiences. This can prepare students to face opportunities and challenges in society and the world of work in the future (Rachmadhani & Kamalia, 2023).

The COVID-19 pandemic has had a major influence on the implementation of the Merdeka curriculum in high schools in terms of shifts in learning systems, materials, methods, assessment flexibility, and adaptation to technology. The COVID-19 pandemic presents its own challenges in assessing student learning outcomes (Rahim Mansyur, 2020). The Merdeka Curriculum must provide flexibility in assessment to consider changing and varying conditions among students, including the possibility of limited access to technology or non-ideal learning environments (Sarnoto, 2024). Paying attention to the impacts above, teaching staff and schools need to take steps to ensure that student assessments in the Merdeka curriculum remain relevant, fair, and meaningful during and after the COVID-19 pandemic has passed (Maria et al., 2021). Conceptually, assessment of high school student learning outcomes is designed to better support a learning approach that is student-centered, more flexible, and provides a holistic picture of student achievement in learning. (DePorter, B. and Hernacki, 2002) explain that the implementation of an independent curriculum focuses on how to implement the curriculum with differentiated learning. Differentiated learning is an approach aimed at teachers meeting the needs of each student

(MS, 2023). Differentiated learning is a teaching and learning process for students who can learn material according to each student's abilities, interests, and needs. So that in this process, students do not experience frustration and feel like they have failed in the learning experience carried out (Holst et al., 2020).

The Merdeka Curriculum provides principles and approaches that are different from the traditional approach to assessing high school student learning outcomes (Mulyasa, 2023). Some of the main points in this assessment are regarding formative assessments, emphasis on skills and competencies, portfolios and projects, performance-based assessments, holistic understanding, inclusion, and differentiation (Arofaturrohman et al., 2023) . Specific to the principles and approaches of inclusion and differentiation are assessments that take into account the individual needs and characteristics of students (Listiani et al., 2022). This also includes providing additional support to students with special needs as well as adapting assessments to meet the diverse needs of the students in the class. Several empirical studies have found that the curriculum is able to hone students' learning abilities. This was explained by Nurwiantin (2022) in (Marlina & Aini, 2023), who stated that an independent curriculum can provide solutions to educational challenges in the 4.0 era as well as hone skills from an early age on essential material and develop student character and competence. In particular, (Tamara, 2024)explains that the application of differentiated learning can improve student learning activities and outcomes. Meanwhile, (Hartati, 2015)also found that there was a clear difference between classes that applied differentiated learning readiness and differentiated learning style.

Lima Puluh Kota is a district that has implemented the Independent Curriculum for All Senior High Schools (SMA) since 2022/2023. With an area of 3,571.14 km2, Limapuluh Kota Regency has a total of 19 high schools, including 16 state schools and 3 private schools. (BPS, 2023). The total number of high school teachers supporting the Independent Curriculum in this district is 529, both public and private, serving 4,178 students. The average ratio of high school students to teachers in Limapuluh Kota Regency is 7.89 students per teacher. The main problem that occurs in the implementation of the independent curriculum is the availability of resources in schools, both from teacher resource factors, competencies possessed, facilities and infrastructure owned, the potential possessed by students, and the socio-demographic background of students. For this reason, this research aims to analyze how effective differentiation is in implementing the

independent curriculum in State Senior High Schools (SMA) in Limapuluh Regency, West Sumatra City, in 2024.

METHODS

This research was conducted on high school students in Limapuluh Kota Regency, West Sumatra Province, using a quantitative approach. The population of this research is high school students in Limapuluh Kota Regency, with a total of 4,178 students (BPS, 2023). This student population is spread across 18 high schools, with 16 categories being state schools and 2 private schools. Meanwhile, the sample for this research was students from SMAN 1 Harau with 380 observations from class X (Phase E) for the 2023/2024 academic year and SMAN 2 Harau from class The total number of observers was 452. This research was conducted from January to June 2024. The sampling technique used in this research was purposive sampling.

The data analysis technique used in this research uses multiple linear regression analysis (Ordinary Least Squares) (OLS) (Regresi Linier Berganda Dengan Variabel Kualitatif, 2010). There are three important aspects that need to be considered in the regression model:

1. Non-Deterministic Relationship: Regression analysis is never deterministic. Thus, we need a treatment for variables that are not included in the model.
2. Functional form: the functional form between the dependent and independent variables can be linear or not.
3. Ceteris Paribus. Enter and use the necessary ceteris assumptions in a model. The basic model used in this research is:

$$y = \beta_0 + \beta_i X + e \quad \ldots\ldots(1)$$

Where y is the dependent variable. In the context of this study, the learning value variable for each student is used. The independent variable in this research (X) consists of 1) the main variable, which consists of learning style variables, which consist of audio, visual, and kinesthetic learning styles. Meanwhile, 2) The control variable that can be used in this research is the learning environment, which consists of educational models (dormitory and non-dormitory) and teacher competency (motivating teacher or not). Apart

from that, this research also looks at other control factors in the form of individual student capacity using IQ and gender variables (sex), socio-demographic aspects of students such as education, employment, and parents' income, and other relevant variables.

RESULTS

The following is an analysis of student learning outcome data associated with variable X (learning style) using multiple ordinary least squares (OLS) linear regression analysis. Learning outcomes are taken from several subjects, which are considered to represent the three learning styles. The subjects analyzed are mathematics, Indonesian, economics, and arts and culture. These four subjects have a dominant tendency to apply one of the existing learning styles, be it audio, visual, or kinesthetic.

1. Regression of Mathematics Subject Learning Outcomes

a. Regression with learning style variables

The following is a regression of mathematics value variables that are influenced by learning style variants (audio, visual, and kinesthetic) as follows:

Table 1. Mathematics Subject Regression

Source	SS	df	MS		
Model	288.167.387	3	9.60557958	Number of obs =	450
				F(3, 446) =	0.14
Residual	308.505.932	446	9.1717335	Prob > F =	0.9367
				R-squared =	0.0009
Total	308.794.099	449	68.7737414	Adj R-squared =	-0.0058
				Root MSE =	8.317

log_nilaiMtk	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Style_audio	.328109	1.089507	0.30	0.763	-1.813096	2.469.314
Style_visual	.6243154	1.096156	0.57	0.569	-1.529956	2.778.587
Style_Kinestetik	.1308039	1.097501	0.12	0.905	-2.026113	228.772
_cons	7.885.724	1.152674	68.41	0.000	76.5919	8.112.259

Source: Processed data, 2024

Table 1 explains that learning styles consisting of audio, visual, and kinetic generally do not influence student learning outcomes for mathematics subjects, as can be seen from

the deviation value >0.05. This is possibly due to the lack of maximum application of certain learning styles in learning. However, the data has shown a positive trend towards learning outcomes because the database shows a tendency for some students to have more than one dominant learning style.

b. Regression with teacher competency and the school environment

Table 2. Regression of mathematics scores with school environment and teacher competency

Source	SS	df	MS		
Model	673.340.502	2	336.670251	Number of obs =	452
				F(2, 449) =	5.00
Residual	302.399.379	449	67.3495276	Prob > F =	0.0071
				R-squared =	0.0218
Total	309.132.784	451	68.5438546	Adj R-squared =	0.0174
				Root MSE =	82.067

log_nilaiMtk	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Status_grmat	3.386.364	107.428	3.15	0.002	1.275123	5.497.605
link_school	-2.483.727	1.367.779	-1.82	0.070	-5.171771	.2043174
_cons	7.861.364	.4676188	168.11	0.000	77.69464	7.953.263

Source: Processed data, 2024

Table 2 explains the regression or relationship between mathematics learning outcome variables, teacher competency variables, and the boarding school environment. There is a very significant influence on teacher competency, as indicated by a deviation value of 0.002. But learning outcomes are not influenced by the presence of boarding schools. The analysis above shows that the mathematics learning outcomes of teachers with driving competence have higher scores than teachers who are not driving, with a score difference of 28.54. The presence of driving teachers is able to improve learning outcomes in these subjects. This is because driving teachers have competence in developing Merdeka curriculum.

c. Regression with student personal and sociodemographics

Table 3. Regression of mathematics scores with students' personal and socio-demographics

Source	SS	df	MS		
Model	32.799.897	11	298.180.882	Number of obs =	68
Residual	884.034.376	56	157.863.281	F(11, 56)=	1.89
Total	121.203.335	67	180.900.499	Prob > F=	0.0606
				R-squared=	0.2706
				Adj R-squared=	0.1273
				Root MSE=	39.732

log_valueMtk	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
gender	-.5704205	1.108.409	-0.51	0.609	-279.083	1.649.989
IQ	.1948992	.0827414	2.36	0.022	.0291482	.3606501
Edu_Father	-1.340.694	1.425.645	-0.94	0.351	-4.196.604	1.515.215
job_Father_pnstnipolri	-.4146599	2.419.842	-0.17	0.865	-5.262.185	4.432.866
job_Father_self-employed	1.297.988	1.996.492	0.65	0.518	-2.701.466	5.297.442
job_Father_farmer	.2636319	173.022	0.15	0.879	-3.202.415	3.729.679
income_father	2.117.509	1.740.846	1.22	0.229	-1.369.824	5.604.842
Edu_mother	.2492473	1.573.946	0.16	0.875	-2.903.744	3.402.239
job_ mother _pnstnipolri	-1.777.965	1.876.513	-0.95	0.347	-5.537.072	1.981.142
job_ mother _ self-employed	-1.777.965	1.876.513	-0.95	0.347	-5.537.072	1.981.142
job_mother _farmer	1.545.168	1.697.347	0.91	0.367	-1.855.027	4.945.363
income_ mother	1.877.151	2.116.453	0.89	0.379	-2.362.614	6.116.916
_cons	5.743.545	8.580.501	6.69	0.000	4.024.664	7.462.426

Source: Processed data, 2024

Table 3 explains the influence of students' personal and socio-demographic variables on mathematics learning outcomes. Only the IQ variable shows a significant influence on learning outcomes, with a deviation value of 0.022. The analysis of the influence of IQ on learning outcomes is 0.22 in improving mathematics learning outcomes. while other variables do not have a significant effect on student learning outcomes in mathematics subjects.

2. Analysis of learning outcomes for Indonesian language subjects

a. Regression with learning style variables

Table 4. Regression results of Indonesian language scores with learning styles

Source	SS	df	MS	Number of obs =	450
				F(4, 445) =	14.54
Model	199.709.779	4	499.274448	Prob > F =	0.0000
Residual	152.795.322	445	34.3360274	R-squared =	0.1156
				Adj R-squared =	0.1076
Total	17276.63	449	38.4780178	Root MSE =	58.597

log_nilaibhs~d	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
AsalSekolah	5.659.837	.7646237	7.40	0.000	4.157115	7.162.559
gaya_audio	.6231541	.7699355	0.81	0.419	-.8900072	2.136.315
Gaya_visual	1.012.707	.7736539	1.31	0.191	-.5077621	2.533.176
GayaKinestetik	.7826525	.7747032	1.01	0.313	-.7398789	2.305.184
_cons	8.210.644	.8143521	100.82	0.000	80.50598	8.370.689

Source: Processed data, 2024

Table 4 explains that learning styles consisting of audio, visual, and kinesthetic in general have not influenced student learning outcomes in Indonesian language subjects but have shown a positive tendency towards learning outcomes.

b. Regression with teacher competency and school environment

Table 5. Regression of Indonesian language scores with teacher competency and boarding school environment

Source	SS	df	MS	Number of obs =	452
Model	202.124.044	1	202.124.044	F(1, 450) =	59.23
Residual	153.553.619	450	341.230.264	Prob > F =	0.0000
				R-squared =	0.1163
Total	173.766.023	451	385.290.517	Adj R-squared =	0.1144
				Root MSE =	58.415

log_nilai_b~a	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Status_grbind	5.778.567	.7508185	7.70	0.000	4.303.021	7.254.113
link_school	5.778.567	.7508185	7.70	0.000	4.303.021	7.254.113
_cons	8.303.421	.2996622	277.09	0.000	824.453	8.362.312

Source: Processed data, 2024

Table 5 explains the regression results between Indonesian language scores and teacher competency variables, and the boarding school environment has a significant

influence on these two factors, with a deviation value of 0.000. The regression analysis above shows that the results of learning Indonesian from teachers who have the competence of driving teachers have higher results than teachers who are not driving, with a score difference of 322.11. Meanwhile, the existence of boarding schools also increases learning outcomes in these subjects, with the same value difference of 322.11. This is considered positive, because one of the goals of boarding schools is to maximize students' learning abilities.

c. Regression with student personal and sociodemographics

Table 6. Regression of Indonesian language scores with students' personal and socio-demographics

Source	SS	df	MS		
Model	168.040.933	11	152.764.485	Number of obs =	68
				F(11, 56) =	1.15
Residual	745.638.342	56	133.149.704	Prob > F =	0.3441
				R-squared =	0.1839
Total	913.679.275	67	136.370.041	Adj R-squared =	0.0236
				Root MSE =	3.649

log_nilai_bhsindon ~a	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
gender	1.327.752	1.017.957	1.30	0.197	-.7114607	3.366.965
IQ	.0907706	.0759893	1.19	0.237	-.0614542	.2429954
Edu_father	-2.041.459	1.309.305	-1.56	0.125	-4.664.312	.5813946
job_father_pnstnipolri	-.8529896	2.222.371	-0.38	0.703	-5.304.933	3.598.954
job_ father _self-emlpoyed	-111.731	1.833.568	-0.61	0.545	-4.790.389	2.555.768
job_ father _farmer	-1.939.214	1.589.025	-1.22	0.227	-5.122.415	1.243.986
income_ father	.4939018	1.598.784	0.31	0.759	-2.708.848	3.696.651
Edu_mother	1.967.138	1.445.504	1.36	0.179	-.9285537	486.283
job_mother_pnstnipolri	-1.165.958	172.338	-0.68	0.501	-4.618.304	2.286.387
job_ibu_self employed	-1.165.958	172.338	-0.68	0.501	-4.618.304	2.286.387
job_ father _farmer	.427713	1.558.835	0.27	0.785	-2.695.009	3.550.435
income_mother	-.2420445	194.374	-0.12	0.901	-4.135.824	3.651.735
_cons	7.943.857	788.029	10.08	0.000	6.365.245	9.522.468

Source: Processed data, 2024

Table 6 explains the regression of Indonesian language learning outcomes with students' personal and socio-demographic variables, where these variables do not show a significant influence, meaning that these factors do not really influence improving students' Indonesian language learning outcomes in learning.

3. Analysis of learning outcomes for economics subjects

a. Regression with learning styles

Table 7. Regression of economic values on learning styles

Source	SS	df	MS	Number of obs =	447
				F(4, 442) =	10.29
Model	95.632.603	4	239.081508	Prob > F =	0.0000
Residual	102.668.027	442	23.2280604	R-squared =	0.0852
				Adj R-squared =	0.0769
Total	112.231.287	446	25.1639657	Root MSE =	48.195

log_nilaieko	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
AsalSekolah	3.976.255	.6292414	6.32	0.000	2.739578	5.212.932
gaya_audio	-.0074891	.6339869	-0.01	0.991	-1.253492	1.238.514
Gaya_visual	.0320529	.6370993	0.05	0.960	-1.220067	1.284.173
GayaKinestetik	-.4945439	.6379516	-0.78	0.439	-1.748339	.7592514
_cons	8.286.829	.6709521	123.51	0.000	81.54964	8.418.694

Source: Processed data, 2024

Table 7 explains that the regression of economic learning outcomes on learning style has not shown significant changes, so learning style is considered not to influence economic learning outcomes. This is also due to the teacher concerned not yet maximally implementing learning models that apply certain dominant learning styles; besides that, the implementation of learning styles is not yet supported by adequate school facilities.

b. Regression with the School Environment

Table 8. Regression of Economic Values on the School Environment

Source	SS	df	MS	Number of obs	=	449
				F(1, 447)	=	41.62
Model	961.161.929	1	961.161.929	Prob > F	=	0.0000
				R-squared	=	0.0852
Residual	103.239.837	447	230.961.603	Adj R-squared	=	0.0831

Total	112.851.456	448	251.900.571	Root MSE	=	48.058
log_ekonomi	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
link_school	3.987.352	.6180963	6.45	0.000	2.772.616	5.202.087
_cons	8.268.966	.2475137	334.08	0.000	8.220.322	8.317.609

Source: Processed data, 2024

Table 8 explains that boarding school environmental variables have a significant influence on economic learning outcomes, with a value of 0.000. From the analysis, it was found that economic learning outcomes in boarding schools improved with a difference of 52.89 compared to economic learning outcomes in non-boarding public schools. Meanwhile, the driving teacher competency variable is not included in economics subjects, so it is not regressed on like mathematics and Indonesian language subjects because the competence of all economics teachers is the same, namely they are not driving teachers.

c. Regression with student personal and sociodemographic

Tabbel 9. Regression of economic values on students' personal and socio-demographics

Source	SS	df	MS	Number of obs	440
Model	586.806.679	10	586.806.679	Prob > F	0.0082
Residual	103.911.726	429	242.218.475	R-squared	0.0535
Total	109.779.792	439	250.067.864	Root MSE	49.216

log_ekonomi	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Edu_father	.534621	.5924539	0.90	0.367	-.6298525	1.699.095
job_father_pnstnipolri	.3074751	1.344.089	0.23	0.819	-2.334.344	2.949.295
job_father_self-employed	-.4795221	.9205299	-0.52	0.603	-2.288.832	1.329.788
job_father_farmer	-.432024	.8129493	-0.53	0.595	-2.029.883	1.165.835
income_fatherr	.8258033	.59381	1.39	0.165	-.3413356	1.992.942
Edu_mother	.8396164	.6056908	1.39	0.166	-.3508745	2.030.107
job_mother_pnstnipolri	2.401.739	1.786.315	1.34	0.179	-1.109.279	5.912.757
job_mother_selff-employed	1.350.464	1.668.135	0.81	0.419	-1.928.271	4.629.199

job_mother_farmer	1.434.518	.9220145	1.56	0.120	-.3777098	3.246.746
income_mother	-1.095.175	1.674.597	-0.65	0.513	-4.386.611	2.196.261
_cons	8.252.688	.7741389	106.60	0.000	8.100.531	8.404.846

Source: Processed data, 2024

Table 9 explains the regression of economic values on students' personal values, showing a significant influence on the variables of gender and student IQ. The gender of female students apparently improves their economic learning outcomes more than male students, with a difference of 58.62. Meanwhile, the IQ variable increases economic learning outcomes by 18%. Apart from that, it was found that socio-demographic factors, which included the variables parental education, parental employment, and parental income, had no effect on students' economic learning outcomes.

4. Analysis of learning outcomes in arts and culture subjects

a. Regression with learning styles

Table 10. Regression with Learning Styles

Source	SS	df	MS	Number of obs =	450
				F(4, 445) =	17.32
Model	132.727.332	4	331.81833	Prob > F =	0.0000
Residual	852.672.713	445	19.1611846	R-squared =	0.1347
				Adj R-squared =	0.1269
Total	985.400.044	449	21.9465489	Root MSE =	43.773

log_nilaisen~d	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
AsalSekolah	4.707.358	.5711943	8.24	0.000	3.584784	5.829.931
gaya_audio	.2450363	.5751624	0.43	0.670	-.8853356	1.375.408
Gaya_visual	.1561971	.5779402	0.27	0.787	-.9796341	1.292.028
GayaKinestetik	-.0813003	.578724	-0.14	0.888	-1.218672	1.056.071
_cons	8.313.108	.6083428	136.65	0.000	81.9355	8.432.666

Source: Processed data, 2024

Table 10 explains that certain learning styles have not influenced cultural arts learning outcomes. The regression results show that there is no significant change in arts and culture learning outcomes, but it shows a positive trend. This could be due to the lack of optimal application of learning styles in arts and culture.

b. Regression with the school environment

Table 11. Regression of arts and culture values on the school environment

Source	SS	df	MS	Number of obs =	452
				F(1, 450) =	68.25
Model	129.907.625	1	129.907.625	Prob > F =	0.0000
Residual	856.533.583	450	190.340.796	R-squared =	0.1317
				Adj R-squared =	0.1298
Total	986.441.208	451	218.723.106	Root MSE =	43.628

log_value~d	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
link_school	4.632.639	.5607601	8.26	0.000	3.530.606	5.734.673
_cons	83.25	.2238072	371.97	0.000	8.281.016	8.368.984

Source: Processed data, 2024

Table 11 explains that the boarding school environmental variable turns out to have a significant influence on economic learning outcomes, with a value of 0.000. From the analysis, it was found that the results of studying arts and culture in boarding schools increased by a difference of 101.82 compared to the results of studying arts and culture in non-boarding public schools. Apart from that, the competency variable of driving teachers in arts and culture subjects is not regressed like in mathematics and Indonesian language subjects because the competence of all arts and culture teachers is the same, namely that they are not driving teachers.

c. Regression with student personal and sociodemographics

Table 12. Regression of arts and culture learning outcomes with students' personal and socio-demographics

Source	SS	df	MS	Number of obs =	443
				F(10, 432) =	4.00
Model	822.940.834	10	822.940.834	Prob > F =	0.0000
Residual	889.426.154	432	205.885.684	R-squared =	0.0847
				Adj R-squared =	0.0635
Total	971.720.238	442	219.846.208	Root MSE =	45.375

log_nilaisenbud	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Edu_father	.2259712	.5459185	0.41	0.679	-.8470155	1.298.958
job_father_pnstnipolri	2.126.146	1.233.708	1.72	0.086	-.2986714	4.550.964

job_father_self-employed	1.933.871	.8383316	2.31	0.022	.2861546	3.581.587
job_father_farmer	1.091.553	.7355092	1.48	0.139	-.3540688	2.537.175
income_father	-.0040647	.5441715	-0.01	0.994	-1.073.618	1.065.488
Edu_mother	1.121.005	.5581681	2.01	0.045	.0239418	2.218.068
job_mother_pnstnipolri	-.1799323	1.646.855	-0.11	0.913	-3.416.777	3.056.912
job_mother_self-empoyed	-1.289.253	1.537.933	-0.84	0.402	-4.312.015	1.733.509
job_mother_farmer	124.309	.8485786	1.46	0.144	-.4247664	2.910.946
Income_mother	209.458	1.543.681	1.36	0.176	-.939479	5.128.639
_cons	81.755	.6966908	117.35	0.000	8.038.567	8.312.432

Source: Processed data, 2024

Table 12 explains that the regression of arts and culture learning outcomes with students' personal and socio-demographic variables has not shown a significant influence. Student personal variables (gender and IQ) have deviation values above 0.05, which indicates that they do not affect arts and culture learning outcomes. Meanwhile, demographic variables, which include parental education, parental employment, and parental income, also do not influence students' arts and culture learning outcomes.

DISCUSSION

Effectiveness of learning styles on learning outcomes

The results of research on the implementation of differentiated learning styles on learning outcomes using multiple linear regression analysis Ordinary Least Squares (OLS) showed that the effectiveness of implementing learning styles has not significantly influenced learning outcomes; this can be seen from the data regression results, which have greater significance. greater than 0.05. All learning outcomes in the sample subjects show deviations greater than 0.05. In general, learning styles are not effective in influencing student learning outcomes. This could be due to teachers not being able to apply certain learning styles optimally to learning. Apart from that, the school database also shows a tendency for some students to have more than one dominant learning style. There are students who have two dominant learning styles, such as audio-visual, audio-kinesthetic, and visual-kinesthetic. There are even students who tend to have a dominant learning style

for all three, namely audiovisual-kinesthetic. Even though it has not yet shown significant results, learning styles have shown a positive tendency towards learning outcomes.

Effectiveness of the learning environment on learning outcomes

The learning environment is very effective in influencing student learning outcomes. The boarding school environment generally improves student learning outcomes, which is shown through regression of sample subjects, namely Indonesian language subjects, which can improve results by a difference of 322.11 for boarding schools compared to non-boarding schools. Students in boarding schools also have increased learning outcomes in economics subjects by 3.99 compared to non-boarding schools, while arts and culture subjects in boarding schools are also able to increase their learning outcomes by 101.82 compared to non-boarding schools. The research results show that the boarding school environment greatly influences student learning outcomes. This is considered positive because one of the goals of boarding schools is to maximize students' learning abilities by creating a conducive learning environment with strong structure and discipline, with students being monitored 24 hours a day.

The effectiveness of teacher competence on learning outcomes

The teacher competency referred to is the competency of driving teachers. Driving teachers in the Independent Curriculum are teachers who have an important role in implementing the Independent Curriculum in schools. They are responsible for planning, implementing, evaluating, and developing curriculum in schools. These driving teachers are expected to be able to inspire, motivate, and support the professional development of fellow teachers in implementing the Independent Curriculum well. The competency of driving teachers at Limapuluh Kota State High School, especially in sample schools, has only reached 8% of all existing teachers. The research results show that the effectiveness of teacher competency can influence mathematics learning outcomes by 28.54, where driving teachers are able to improve student learning outcomes compared to teachers who do not have driving competence. Likewise, the results of learning Indonesian taught by driving teachers were able to increase learning outcomes by 322.11 compared to teachers who did not have driving competence.

Student personal effectiveness on learning outcomes

Student personal factors related to IQ and gender variables. The IQ variable influences student learning outcomes, with a difference in scores of 0.22 in mathematics subjects and 0.18 in economics subjects. Meanwhile, the gender variable influences economic learning outcomes, with a difference in value of 58.62 between women and men. The research results show that IQ influences student learning outcomes. Likewise, gender also influences student learning outcomes, with women having better learning outcomes than male students.

The effectiveness of student socio-demographics on learning outcomes

Socio-demographics are social factors in the student's environment, which include parents' education, parents' employment, and parents' economic status. Sociodemography studies how these social factors influence the demographic patterns of a population, especially in terms of the education of state high school students in Limapuluh Kota Regency. The research results show that variables related to student socio-demographics, which include parents' education, parents' employment, and parents' income, do not have a significant influence on learning outcomes. This is shown through regression data with deviations above 0.05. So it can be concluded that socio-demographic factors do not influence student learning outcomes.

CONCLUSION

Learning style is one part of differentiated learning in the form of content; in general, students have a tendency towards a dominant learning style. According to theory, in general, there are three dominant learning styles: audio, visual, and kinesthetic. Almost all previous researchers' research found that the application of certain learning styles will influence student learning outcomes, but the results of research using school databases and using Ordinary Least Squares (OLS) multiple linear regression analysis found that the main X variable (learning style) had no effect on the results. student learning. Meanwhile, other control variables, such as the competence of driving teachers, the boarding school environment, and student personal factors (IQ and gender), influence student learning outcomes. This research has an impact on the quality of learning and improving the quality of education in schools. By utilizing a school database, the causes and effects of setbacks and educational success at school will be known, especially student learning outcomes. So

far, the use of school databases has not made a significant contribution to improving student learning outcomes, even though these learning outcomes are very useful in determining the future of high school students in continuing their education at university.

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