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Effect of Curriculum Implementation, Widyaiswara Competence, Facilities and Infrastructure Management on Learning Outcomes of Metrological Education and Training Participants

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ABSTRACT

Implementing the curriculum, widyaiswara, and facilities are the main pillars in realizing the training process for metrological training participants in achieving the expected learning outcomes. Although the facilities can be considered adequate, the variables affecting improving the quality of learning outcomes of the metrology training participants need to be determined. The purpose of this study was to review the effect of curriculum implementation, widyaiswara, and facilities on the quality of learning outcomes for metrology training participants. This research method used a survey method with a quantitative approach. Data analysis was performed using linear regression test and T-test. The study's results stated that the T-test on the variables of curriculum implementation, widyaiswara, and facilities, as well as their combination on learning outcomes, resulted in a significance value of less than 0.05 at the 95% confidence level. This study concluded that implementing curriculum, widyaiswara competencies, facilities, and a combination of the three positively and significantly impact the quality of metrological training participants' learning outcomes.

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1. Introduction

The many problems related to the low competence of Civil Servants cannot be resolved quickly because they are related to the stigma of the wider community and the quality of human resources (HR) who are less competent in their fields. Education and training, as an effort to improve the competence given to civil servants, aim to improve the competence and professionalism of civil servants to improve their functions in serving the community. Implementing education and training for civil servants is based on Government Regulation Number 101 of 2000 concerning Education and Training for Civil Servants, which states that efforts to increase professionalism to create competence in Human Resources (HR) for apparatus can be carried out through education and training.

Widyaiswara is needed to increase civil servants' competence and professionalism. Widyaiswara are professional, functional staff tasked with educating, teaching and training, idealized by the concept of planning and implementing the learning process, assessing learning processes and outcomes, conducting mentoring, and conducting research. In the Regulation of the Minister of State Apparatus Empowerment and Bureaucratic Reform of the Republic of Indonesia, Number 22 of 2014, concerning the functional positions of widyaiswara and their credit scores, the main tasks of widyaiswara are to carry out education, teaching, and training for Civil Servants as well as evaluation and development of training at Government Training Institutions (Hamzah, 2017). Based on the Regulation of the Head of the State Administrative Institute of the Republic of Indonesia Numbers 11, 12 and 13 of 2013, the three main elements of successful education and training are curriculum, widyaiswara competence, and facilities. The quality of the curriculum and the competence of widyaiswara in implementing education and training must be supported by the minimum fulfillment of training facilities and infrastructure. Facilities in the form of facilities and infrastructure in the implementation of education and training must be supported by adequate facilities related to the quality of values and service, such as study rooms, laboratory testing rooms, tera trial simulation rooms, and reading rooms. Elmeida & Pranajaya (2017) shows that the quality of practical curriculum implementation simultaneously affects graduate satisfaction. Research conducted by Diharja (2019) states that there is a significant and positive influence between facilities and widyaiswara on the satisfaction of training participants. Facilities and infrastructure positively contribute to the student learning process (Megawati & Rochman, 2019).

Education and training for metrology training participants require a curriculum, widyaiswara, and facilities in the teaching and learning process. Implementing the curriculum, widyaiswara, and facilities are the main pillars in realizing the training process for metrological training participants in achieving the expected learning outcomes. At the Metrological Resource Development Center, all facilities and infrastructure have been provided and are still functioning properly and can be utilized by training participants. Even though the facilities can be considered adequate, it is necessary to determine the variables that influence improving the quality of the results of metrology training and education participants so that the variables that

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must be improved can be identified to improve the quality of the learning outcomes of training and training participants. This study aims to review the effect of curriculum implementation, widyaiswara, and facilities on the quality of learning outcomes in metrology training participants.

2. Literature Review

2.1. Widyaiswara Competence

Widyaiswara is a functional official with the status of a civil servant with the duties, responsibilities, authorities and rights to carry out civil servant education, teaching and training activities, Evaluation and Training Development at Government Education and Training Institutions (Hamzah, 2017; Nugroho et al., 2018; Permana, 2019; Syahid, 2021; Tunsiah, 2021). Widyaiswara is a functional position that can be categorized as a senior functional position because it has existed since 1987 (Tunsiah, 2021). In carrying out their duties and functions as a functional position, widyaiswara has standard competency positions. Widyaiswara always has established competency standards for positions according to their position level.

Functional expertise positions, including widyaiswara, are divided into 4 (four) levels of positions, namely first expert level, junior expert level, intermediate expert level, and main expert. Position competency standards describe the knowledge, skills, and behaviors required to perform duties as functional widyaiswara. Widyaiswara is one of the most important training components, and in carrying out their duties, they are required to be professional. In general, the competencies required of a widyaiswara are 1). Learning management competency; the ability to plan, compile, implement, and evaluate learning, 2). Personal competence; ability regarding behavior in carrying out the duties of his position that can be observed and used as a role model for training participants, 3). Social competence; is the ability that widyaiswara must have in dealing with his work environment, 4). Substantive competence; abilities that widyaiswara must have in the scientific field and skills in the training subjects being taught. The better the level of competence of a widyaiswara, the better the delivery of the material. Good mastery of the material, followed by solid personality and social skills, makes the relationship between the training participants and the widyaiswara run conducive. The existence of a conducive and harmonious relationship in the training process will lead to satisfaction for the training participants.

2.2. Training Curriculum

The curriculum comes from Latin, which means the road or race arena passed by the train. Then, this term was adopted in the field of education so that it implies a collection of subjects that must be taught by teachers or studied by students or a collection of subjects determined by schools to be studied by students to graduate and obtain a diploma (Thaib & Siswanto, 2015).

Law of the Republic of Indonesia, Number 20 of 2003 Concerning the National Education System (Republik Indonesia, 2003), explains that the curriculum is "a set of plans and arrangements regarding objectives, content, and learning materials as well as methods used as guidelines for implementing learning activities to achieve certain educational goals" (Chapter I Article 1 paragraph 19). In the Big Indonesian Dictionary, what is meant by curriculum is the set of subjects taught at educational institutions; or course sets regarding specific areas of expertise (KBBI, 2019). According to Waluyo (2016, p. 75), the curriculum is "all experiences and learning activities that are planned and organized to be handled by participants to achieve curriculum objectives that a training institution has set".

https://doi.org/10.33019/society.v10i1.413

The position of the curriculum (training design) is central. The reason is that the design of the training program marked by the curriculum preparation is the output or result of the training needs process and the formulation of objectives. In addition, the curriculum is input or input for the next process, namely training implementation and evaluation. The Center for Metrological Resource Development, as the implementing element of the Ministry of Trade in the field of metrological education and training, has a high commitment to continue making efforts to make improvements and innovations to answer the problems that occur in the development of government apparatus by developing both the type and number of appropriate quality apparatus training programs with the needs, as implementation and accountability for improving the quality of HR apparatus within the Ministry of Trade. To achieve an increase in the quality of the HR apparatus, it is necessary to have a curriculum that suits the needs.

2.3. Training Facilities and Infrastructure

Educational facilities can directly support the educational process, while educational infrastructure indirectly supports the educational process. Sukirman (2010, p. 290) explains that in terms of its function or role in the teaching and learning process, educational facilities are divided into three types: learning tools, visual aids and teaching media. Management of educational infrastructure is a series of activities for the management of educational infrastructure, starting from planning, procurement, inventorying, and use up to elimination to achieve effective and efficient educational goals. According to Matin & Fuad (2016, p. 21), procurement of educational facilities and infrastructure is "all activities carried out by providing all the necessary goods and services based on the results of planning to support learning activities so that learning activities can run effectively and efficiently following the desired goals".

2.4. Training Learning Outcomes

Education and training is an activity or program to meet the community's learning needs. The objectives of the training are determined according to the learning needs agreed upon between trainers and trainees (trainees). Much research has been conducted on the effectiveness of training in meeting the learning needs of a dynamic society (Anugrahwanto & Nurhayati, 2020; Hudri & Nurhayati, 2020; Intadiyah et al., 2021; Nurhayati, 2018; Nurmawati et al., 2021). Mulyasa (2016) explains that quality learning outcomes are learning outcomes that can meet the user community's needs, both explicitly and implicitly. Therefore, higher education institutions must realize public accountability, have a social responsibility, and maintain and continuously improve the quality of education following their requirements (Mulyasa et al., 2018).

Meanwhile, improving the quality of learning is needed to increase competitiveness, the ability to understand the nature of change, and take advantage of these opportunities to rise while anticipating the fading of nationalism and the erosion of national ideology, and the inculcation of the Indonesian nation's value system (Mulyasa et al., 2020). This needs to be done because, in reality, the quality of education and educational outcomes are still low compared to the quality of educational output in other countries (Mulyasa & Aryani, 2017). From some of these opinions, it can be concluded that learning outcomes are assessments of the results that have been achieved by each student in the cognitive, affective and psychomotor domains obtained as the effort's results of learning activities and are assessed within a certain period.

Behavior as a result of the learning process is influenced by various factors, both internal factors and external factors. Internal factors are anything a person owns, including interests and

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attention, habits, motivation and other factors. In comparison, external factors in the learning process can be divided into three environments: family, school, and community. Among the three environments that have the greatest influence on students' process and learning outcomes in the teaching and learning process is the school environment, such as teachers, learning facilities, curriculum, classmates, school regulations, and others. The elements of the school environment mentioned above essentially function as a learning environment for students, namely the environment where students interact to foster learning activities in themselves.

After exploring the description of achievement and learning, it can be concluded that learning achievement is the result obtained in the form of impressions that result in changes from within the individual as a result of learning activities. A person's learning achievement is the actualization of his potential, meaning that learning manifests individual potential abilities.

3. Research Method

This study uses a survey method with a quantitative approach. This research was carried out in 2018 and was carried out at the Ministry of Trade's Metrological Resources Development Center, located Jl. Daeng Muh. Ardiwinata km 3.4 Cihanjuang, Porongpong, West Bandung Regency. The targets in this study were participants in metrological training organized by the Metrological Resource Development Center for the 2018 Fiscal Year. The research instrument used a questionnaire containing statement items related to curriculum implementation, widyaiswara competencies, facilities, and infrastructure. Respondents were given a questionnaire to fill out in the provided answer column. The answer column is in the form of a Likert scale consisting of "very bad (1)", bad (2)", "not good (3)", "good (4)", and "very good (5)". The data collection technique used in this study was the distribution of questionnaires given to training participants at the Center for Metrological Resources Development of the Ministry of Trade by asking questions logically related to research problems and closed/structured statements concerning respondents' opinions. Data were analyzed statistically with the Pearson correlation test and multiple linear regression using SPSS for Windows version 25.0 software.

4. Results and Discussion

4.1. Validity Test

Testing the research instrument's validity was conducted by conducting a questionnaire trial of 56 respondents. Test the validity of the measurements in this study using the Pearson Product Moment correlation test. The validity test was carried out on questionnaire items related to curriculum implementation, widyaiswara competencies, facilities, and infrastructure. The results of testing the validity of the curriculum implementation instrument showed that of the 20 questions on the research instrument, the variables after being interpreted in consultation with the critical price r product moment (r_{table}) at 95% confidence intervals were 0.4438. Based on the results of testing the validity of the instrument, 17 statement items on the research instrument curriculum implementation variable are greater than r_{table} ($r_{count} > 0.4438$), and 3 statement items on the research instrument are smaller than r_{table} ($r_{count} < 0.4438$) so that 17 questions valid and three other statement items are not valid. A total of 17 valid statement items were applied to the questionnaire as a data collection instrument related to curriculum implementation. The results of testing the validity of the curriculum implementation variable instrument can be seen in **Table 1**.

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Table 1. Results of Testing the Validity of Curriculum Implementation Variable Instruments

No	Statement Points	r count	r table (95%:α 0.05)	Test Results
1.	Statement 1	0.680	0.4438	Valid
2.	Statement 2	0.787		Valid
3.	Statement 3	0.682		Valid
4.	Statement 4	0.683		Valid
5.	Statement 5	0.683		Valid
6.	Statement 6	0.817		Valid
7.	Statement 7	0.615		Valid
8.	Statement 8	0.560		Valid
9.	Statement 9	0.615		Valid
10.	Statement 10	0.715		Valid
11.	Statement 11	0.894		Valid
12.	Statement 12	0.847		Valid
13.	Statement 13	0.814		Valid
14.	Statement 14	0.888		Valid
15.	Statement 15	-0.025		Invalid
16.	Statement 16	0.069		Invalid
17.	Statement 17	0.254		Invalid
18.	Statement 18	0.836		Valid
19.	Statement 19	0.572		Valid
20.	Statement 20	0.855		Valid

The results of testing the validity of the widyaiswara competency instrument show that of the 20 statement items on the research instrument, these variables, after being interpreted in consultation with the critical price r product moment (r_{table}) at a 95% confidence interval 0.4438. Based on the results of testing the validity of the instrument, 15 questions on the research instrument variable widyaiswara competence were greater than the r_{table} ($r_{count} > 0.4438$), and five questions on the research instrument were smaller than the r_{table} ($r_{count} < 0.4438$). Based on the results of the validity test of the Widyaiswara competency instruments, 15 instruments were declared valid, and five instruments were declared invalid, so 15 valid question items on the widyaiswara competency variable instruments were appropriate to be used as data collection tools. The results of testing the validity of the widyaiswara competency variable instruments can be seen in **Table 2**.

Table 2. Results of Instrument Validity Testing of Widyaiswara Competency Variables

No	Instrument	r count	r table (95%:α 0.05)	Test Results
1.	Statement 1	0.566	0.4438	Valid
2.	Statement 2	0.728		Valid
3.	Statement 3	0.579		Valid
4.	Statement 4	0.429		Invalid
5.	Statement 5	0.589		Valid

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No	Instrument	r count	r table (95%:α 0.05)	Test Results
6.	Statement 6	0.617		Valid
7.	Statement 7	0.727		Valid
8.	Statement 8	0.550		Valid
9.	Statement 9	0.465		Valid
10.	Statement 10	0.767		Valid
11.	Statement 11	0.730		Valid
12.	Statement 12	0.666		Valid
13.	Statement 13	0.669		Valid
14.	Statement 14	0.706		Valid
15.	Statement 15	0.584		Valid
16.	Statement 16	-0.148		Invalid
17.	Statement 17	0.261		Invalid
18.	Statement 18	0.222		Invalid
19.	Statement 19	0.541		Valid
20.	Statement 20	0.217		Invalid

The results of testing the validity of the Facilities and Infrastructure Management instrument show that of the 20 questions on the research instrument, these variables, after being interpreted in consultation with the critical price r product moment (r_{table}) at a 95% confidence interval is 0.4438. Based on the results of testing the validity of the instrument, 16 questions on the research instrument variable managing facilities and infrastructure were greater than the r_{table} ($r_{count} > 0.4438$), and four questions on the research instrument were smaller than r_{table} ($r_{count} < 0.4438$). Based on the test results of facilities and infrastructure management instruments, 16 statement items were declared valid, and 4 statement items were declared invalid, so 16 valid statement items on the variable instrument management of facilities and infrastructure were also suitable for the data collection tool. The results of testing the validity of the variable instrument management of facilities and infrastructure can be seen in **Table 3**.

Table 3. Results of Testing the Instrument Validity of Facilities and Infrastructure Management Variables

No	Instrument	r count	r table (95%:α 0,05)	Test Results
1.	Instrument 1	0.657	0.4438	Valid
2.	Instrument 2	0.355		Invalid
3.	Instrument 3	0.745		Valid
4.	Instrument 4	0.316		Invalid
5.	Instrument 5	0.741		Valid
6.	Instrument 6	0.561		Valid
7.	Instrument 7	0.376		Invalid
8.	Instrument 8	0.694		Valid
9.	Instrument 9	0.541		Valid
10.	Instrument 10	0.692		Valid
11.	Instrument 11	0.815		Valid
12.	Instrument 12	0.804		Valid

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No	Instrument	r_{count}	r_{table} (95%:α 0,05)	Test Results
13.	Instrument 13	0.640		Valid
14.	Instrument 14	0.611		Valid
15.	Instrument 15	0.604		Valid
16.	Instrument 16	0.788		Valid
17.	Instrument 17	0.843		Valid
18.	Instrument 18	0.779		Valid
19.	Instrument 19	0.647		Valid
20.	Instrument 20	0.890		Valid

4.2. Reliability Test

A reliability test is conducted to determine the extent to which the results of a measurement can be trusted. A good instrument will not be tendentious in directing respondents to choose certain answers. Reliable instruments that are reliable will produce reliable data as well. Reliability tests were carried out on questionnaire items related to curriculum implementation, widyaiswara competencies, facilities, and infrastructure. Reliability testing on curriculum implementation variables was carried out using Cronbach's Alpha. The reliability test on curriculum implementation resulted in a Cronbach's Alpha value of 0.899. This value states that the results of filling out the questionnaire on the questions related to curriculum implementation are very reliable. The Cronbach's Alpha value between 0.80-1.00 shows that the instrument belongs to a very reliable group (Dhamayanti et al., 2018). The results of the reliability test on the curriculum implementation variable can be seen in **Table 4**.

Table 4. Instrument Reliability Test Results on Curriculum Implementation Variables

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.899	.927	20

Reliability testing on the widyaiswara competency variable was conducted using Cronbach's Alpha. The reliability test on widyaiswara's competence resulted in a Cronbach's Alpha value of 0.801. This value states that the results of filling out the questionnaire on the questions related to widyaiswara competence are very reliable. The results of the reliability test on the widyaiswara competency variable can be seen in **Table 5**.

Table 5. Instrument Reliability Test Results on Widyaiswara Competency Variables

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.801	.871	20

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Reliability testing on infrastructure and facilities variables was carried out using Cronbach's Alpha method. The reliability test on infrastructure and facilities variables resulted in a Cronbach's Alpha value of 0.844. This value states that the results of filling out the questionnaire related to infrastructure and facilities are very reliable. The results of the reliability test on infrastructure and facilities variables can be seen in **Table 6**.

Table 6. Instrument Reliability Test Results on Infrastructure and Facilities Variables

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.844	.891	20

4.3. The Effect of Curriculum Implementation on the Quality of Learning Outcomes of Participants in Metrological Education and Training

The effect of curriculum implementation on the quality of learning outcomes of metrology training participants can be seen based on the linear regression test and T-test. The results of the linear regression test stated that the resulting R-value was 0.906, and the R Square was 0.821. Based on these data, the effect of widyaiswara competence on the learning outcomes of metrological education and training participants was 82.1%, while other factors not examined were 17.9%. The results of the linear regression test on the curriculum implementation variable on the learning outcomes of training participants can be seen in **Table 7**.

Table 7. Linear Regression Test Results on Curriculum Implementation Variables on Learning Outcomes of Education and Training Participants

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.906[a]	.821	.818	1.73381
a. Predictors: (Constant), Curriculum Implementation (X1)			

The effect of curriculum implementation on training participants' learning outcomes was also analyzed using the T-test at the 95% confidence level. The analysis results with the T-test, with a significance value of 0.000, less than 0.05. This shows that curriculum implementation has a positive and significant influence on the learning outcomes of metrological education and training participants. The T-test results on the curriculum's variable implementation on the learning outcomes of training participants can be seen in **Table 8**.

https://doi.org/10.33019/society.v10i1.413

Table 8. T-Test Results on Curriculum Implementation Variables on Learning Outcomes of Education and Training Participants

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	-1.655	4.502		-.368	.715
Curriculum Implementation (X1)	1.027	.065	.906	15.759	.000
a. Dependent Variable: Learning Outcomes of Education and Training Participants (Y)					

4.4. The Effect of Widyaiswara Competence on the Quality of Learning Outcomes of Participants in Metrological Education and Training

The effect of widyaiswara competence on the quality of learning outcomes of metrology education and training participants can be seen based on the linear regression test and T-test. The results of the linear regression test stated that the resulting R-value was 0.839 and the R square was 0.704. Based on these data, the effect of widyaiswara competence on the learning outcomes of metrological education and training participants was 70.4%, while other factors not examined were 29.6%. The results of the linear regression test on the widyaiswara competency variable on the learning outcomes of training participants can be seen in **Table 9**.

Table 9. Hasil Uji Regresi Linear pada Variabel Kompetensi Widyaiswara terhadap Hasil Belajar Peserta Diklat

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.839[a]	.704	.699	2.23088
a. Predictors: (Constant), Widyaiswara Competence (X2)			

The effect of widyaiswara competence on training participants' learning outcomes was also analyzed using the T-test at a 95% confidence level. The analysis results with the T-test have a significance value of 0.000, less than 0.05. This shows that widyaiswara competence positively and significantly influences the learning outcomes of metrological education and training participants. The T-test results on the widyaiswara competency variable on the learning outcomes of training participants can be seen in **Table 10**.

Table 10. T-Test Results on Widyaiswara Competency Variables on Learning Outcomes of Education and Training Participants

Coefficients[a]					
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.538	5.533		1.182	.243
	Widyaiswara Competence (X2)	1.019	.090	.839	11.341	.000

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a. Dependent Variable: Learning Outcomes of Education and Training Participants (Y)

4.5. The Influence of Infrastructure and Facilities on the Quality of Learning Outcomes of Participants in Metrological Education and Training

The effect of infrastructure and facilities on the quality of learning outcomes of metrology training participants can be seen based on the linear regression test and T-test. The results of the linear regression test stated that the resulting R-value was 0.562, and the R square was 0.315. Based on these data, the effect of infrastructure and facilities on the learning outcomes of metrological education and training participants was 31.5%, while other factors not examined were 68.5%. The results of the linear regression test on the infrastructure and facilities variables on the learning outcomes of training participants can be seen in **Table 11**.

Table 11. Linear Regression Test Results on Infrastructure and Facilities Variables on Learning Outcomes of Education and Training Participants

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562[a]	.315	.303	3.39457

a. Predictors: (Constant), Facility and Infrastructure Management (X3)

The influence of infrastructure and facilities on the learning outcomes of training participants was also analyzed using the T-test at the 95% confidence level. The analysis results with the T-test, with a significance value of 0.000, less than 0.05. This shows that infrastructure and facilities positively and significantly influence the learning outcomes of metrological education and training participants. The T-test results on the training participants' learning outcomes on the infrastructure and facilities variables can be seen in Table 12. The relationship between curriculum implementation, widyaiswara competence, and infrastructure and facilities on the learning outcomes of metrology training participants can be seen in **Figure 1**.

Table 12. T-Test Results on Infrastructure and Facilities Variables on Learning Outcomes of Education and Training Participants

Coefficients[a]					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
(Constant)	26.713	8.531		3.131	.003
Facility and Infrastructure Management (X3)	.656	.131	.562	4.987	.000

a. Dependent Variable: Learning Outcomes of Education and Training Participants (Y)

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4.6. The Influence of Combination of Curriculum Implementation, Widyaiswara Competence, Management of Facilities and Infrastructure on Learning Outcomes of Metrological Education and Training Participants

The effect of the combination of curriculum implementation, widyaiswara competence, and facilities and infrastructure management on the quality of learning outcomes of metrological education and training participants can be seen based on the linear regression test and T-test. The results of the linear regression test stated that the resulting R-value was 0.940, and the R-square was 0.883. Based on these data, the influence of curriculum implementation, widyaiswara competence, and facilities and infrastructure management on the learning outcomes of metrological education and training participants was 88.3%, while other factors not examined were 11.7%. The results of the linear regression test on the variables of curriculum implementation, widyaiswara competence, and management of facilities and infrastructure on the learning outcomes of education and training participants can be seen in **Table 14**.

Table 13. Linear Regression Test Results on the Combination of Curriculum Implementation Variables, Widyaiswara Competence, and Management of Facilities and Infrastructure on Learning Outcomes of Education and Training Participants

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940[a]	.883	.876	1.43152

a. *Predictors*: (*Constant*), Facilities and Infrastructure Management (X3), Widyaiswara Competence (X2), Curriculum Implementation (X1)

The effect of the combination of curriculum implementation, widyaiswara competence, and management of facilities and infrastructure on the learning outcomes of training participants was also analyzed using the T-test at the 95% confidence level. The analysis results with the T-test, a significance value of 0.000b where the value is smaller than 0.05. This shows that infrastructure and facilities positively and significantly influence the learning outcomes of metrological education and training participants. The T-test results on the combination of curriculum implementation variables, widyaiswara competencies, and infrastructure and facilities on the learning outcomes of education and training participants can be seen in **Table 14**. The relationship between the variables of curriculum implementation, widyaiswara competencies, and infrastructure and facilities on learning outcomes of education and training participants metrology can be seen in **Figure 1**.

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Table 14. T-Test Results on the Combination of Curriculum Implementation Variables, Widyaiswara Competence, as well as Infrastructure and Facilities on Learning Outcomes of Education and Training Participants

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	802.279	3	267.426	130.500	.000[b]
	Residual	106.561	52	2.049		
	Total	908.839	55			

a. Dependent Variable: Learning Outcomes of Education and Training Participants (Y)
b. Predictors: (Constant), Facilities and Infrastructure Management (X3), Widyaiswara Competence (X2), Curriculum Implementation (X1)

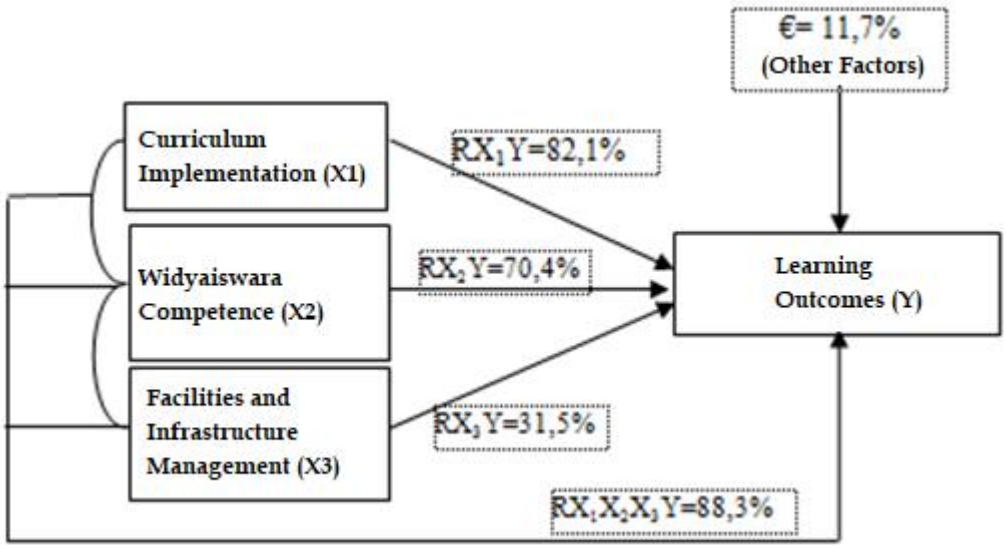

Figure 1. The Relationship between Curriculum Implementation Variables, Widyaiswara Competence, and Infrastructure and Facilities to Learning Outcomes of Education and Training Participants

5. Conclusion

From the research results, it can be concluded that curriculum implementation, widyaiswara competence, and facilities or a combination of the three positively and significantly influence the quality of learning outcomes for metrology training participants.

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7. Declaration of Conflicting Interests

The author has declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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