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IMPROVEMENT OF TECHNICAL TRAINING MATERIALS FOR ROAD AND BRIDGE PRESERVATION SUPERVISORS IN THE CONCRETE PAVEMENT PRESERVATION MODULE (*RIGID PAVEMENT*) IN AN EFFORT TO IMPROVE ROAD PAVEMENT PERFORMANCE

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ABSTRACT
The West Java Province Human Resources Development Agency (BPSDM). in collaboration with Pusbangkom Roads, Settlements and Regional Infrastructure Ministry PUPR, Technical Training Materials for Road and Bridge Preservation Supervisors deemed necessary refined with the aim of, among other things (1) improving the material in the Preservation Module Concrete pavement (2) know what factors can cause deficiencies perfecting the material by validating what modules and strategies are possible maximizing the understanding of training participants so that they can carry out learning well (3). Finding an effective learning method for designing layers Fast track concrete pavement with a concrete age of 7 days can open traffic. This research uses approach research and development. using data analysis techniques from trial results theory Close Technique, while research subjects on learning outcome indicators have not increased material information about concrete design fast track (oven traffic 7 days) by viewing various phenomena, (1) from the systematic assessment of training and learning curricula; target training participants, training organizers, approach to delivering material, methods learning (2) if there is a demand for faster concrete pavement preservation work (open traffic 7 days), repair of damaged concrete pavement and quality control. Module validity content tested by experts in the field and readability by users (training alumni) with distribute questionnaires using Close Technique . The module is acceptable in terms of validity fill in via expert judgement; while the validity of implementation in experimental trials the laboratory shows that all categorized submodules can be implemented (3) Improvements to the concrete pavement preservation module were carried out by adding concrete SOPsn fast-track .Human Resources Development Agency (BPSDM) West Java Province and Pusbangkom for Roads, Settlements and Regional Infrastructure BPSDM Ministry of Works General, to be able to consider proposals for improvements to Road Preservation Training materials and Bridge on Concrete Pavement Preservation Module

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1. INTRODUCTION

Unstable road conditions at each UPTD will increase if road handling does not meet standard road maintenance criteria. apart from *external factors* which influences the acceleration of the level of road damage caused by, among other things; improper work implementation, use of inappropriate materials and most importantly the lack of knowledge and skills of road and bridge preservation supervisors in supervising road maintenance, therefore the West Java Provincial Highways and Spatial Planning Service proposes to hold training.

Table 1 1 Results of Provincial Road Condition Survey in West Java in 2023

HASIL SURVEY KONDISI JALAN PKRMS DAN SDI TA. 2023

NO	UPTD	Panjang Ruas (K	2023			SDI		
			IRP	PKRMS	DEVIASI	2022	2023	DEVIASI
1								
2								
3								
4								
5								
6								

DBMTR data for 2023

Therefore, it is important to look at the quality of the technical training process for road and bridge preservation supervisors. For this reason, researchers look at the importance of whether the training for road and bridge preservation technical supervisors has sufficiently equipped the participants with reliable knowledge and skills as road and bridge preservation technical supervisors through learning methods, modules and learning processes..

To get quality training results, every process must be in accordance with established standards, starting from training participants, widyaiswara/teaching staff, organizers/administrative/IT staff, delivery approaches, learning methods, as well as media and learning modules, and what strategies implementation of the module.

Implementation of Technical Training for Road and Bridge Preservation Supervisors will be carried out from 10 -21 October 2022 (57 lesson hours) by BPSDM West Java Province in collaboration with the Road, Housing and Regional Infrastructure Development Center (Pusbangkom JPW) BPSDM Ministry of PUPR for 10 days with a Technical Training curriculum structure Road and Bridge Preservation Supervisor. a total of 13 modules as follows:

Table 2 .Road and Bridge Preservation Supervisor Technical Training Curriculum Structure

Of the 13 (thirteen) training modules above, the research focuses on Module Number 3, namely "Concrete Pavement Preservation Module"

The reasons for choosing the intended pavement are; Concrete pavement has a high modulus of elasticity, so concrete road construction is stronger, concrete pavement will transmit the load to a large area of subgrade where the composition consists of plates (*Slab*) concrete, as a foundation layer and sub-base layer above the subgrade, concrete also has advantages in strength (*strength*), ease of work (*workability*), durability (*durability*), waterproof (*impenetrablelity*), from a financing perspective, it is more economical than flexible asphalt pavement. However, in general, repairs to failed concrete work will require greater costs, please note

The concrete chosen as part of the construction has met the standards consisting of the Foundation Layer and the Lower Foundation Layer. The instructor experienced problems in delivering the material because there was no material that was in accordance with the latest Indonesian National Work Competency Standards (SKKNI), while the training program held was required.

to refer to the latest SKKNI, so that competent Human Resources are formed. In this case, one example in the Technical Training for Road and Bridge Preservation Supervisors is that one of the Concrete Pavement Preservation Module materials does not yet contain Concrete Pavement material. *Fast Track*.so it is necessary to add an SOP

regarding Concrete *Fast Track* starting from Mix Design, calculation of mix design, proportions of mixed ingredients, slump test and concrete strength, as well as lack of understanding of the addition of additives to the concrete mixture in question.

2. Formulation of the Problem
   a. How to validate what factors cause imperfections in the Road and Bridge Preservation Supervisor Technical Training material in the Concrete Pavement Preservation Module (*Rigid Pavement)* as well as what strategies are able to maximize the understanding of training participants so that they are able to implement learning well in the field
   b. How to improve the Concrete Pavement Preservation Module (*Rigid Pavement)* on Technical Training for Road and Bridge Preservation Supervisors on road surface layers
   c. What is an effective learning method for designing concrete pavement layers (*rigid pavement)* fast track and quality control on Fs 45 quality concrete mix design *fast track?*
3. The objectives of this research are:
   a. Knowing what validation factors can cause imperfections in the Road and Bridge Preservation Supervisor Technical Training material in the Concrete Pavement Preservation Module (*Rigid Pavement)* as well as what strategies are able to maximize the understanding of training participants so that they are able to implement learning well
   b. Refining the Rigid Pavement Preservation Module in the Road and Bridge Preservation Supervisor Technical Training,
   c. Finding an effective learning method for designing fast track concrete pavement layers at a concrete age of 7 days can open traffic
4. Benefits of Research
   a. Knowing the factors that can reduce imperfections in the Road and Bridge Preservation Supervisor Technical Training material in the concrete pavement preservation module, so that participants better understand the material presented and are able to implement the learning well
   b. The Rigid Pavement Preservation Module is more perfect
   c. There is a Practical learning method for Ready Mix Concrete mixtures (Fast Track) to be implemented in the field so that when the concrete is 7 days old it can be open to traffic
5. Previous Research

Previous research was used as a comparison for research references, including:

   a. Validation of learning modules: PPK-based thematic materials and design, Denna Delawanti Chrisyarani1, Arnelia Dwi Yasa21,2 Faculty of Education, Kanjuruhan University Malang
   b. Development of Teaching Modules with a Problem Based Learning Model Oriented to Problem Solving Ability Rezi Ariawan, Reza Utami, Sari Herlina, Endang Istikomah May 2022
   c. Concrete Quality Control in the Implementation of Roads with Rigid Pavement (Sutanto). Vol 9 No 1(2013L July 2013).
   d. Concrete Mix Planning Using Cement Substitution with Fly Ash (*fly Ash*) and Additive Superplactizer (Tri Octaviani, Muha mad Ryanto) JTechno-Socio Ekonomika ballot box, Volume 12 No.2 Oktober2019 Sangga Buana University YPKP
   e. oncrete Compressive Strength Analysis *Fast Track* With Extra Ingredients *Master Glenium Ace 8111* (Damasya Haptakirana Sukmaningtyas[1], Amris Azizi[2], M Agus Salim[3]) December 2020 CIVeng Journal of Civil and Environmental Engineering 1(2) DOI:10.30595/civeng.v1i2.9299

2. RESEARCH METHOD

The type of research method used is **Method *Laboratory experiments***, carried out at the UPTD Soil Testing and Construction Materials Service. Cianjur Regency Public Works and Spatial Planning and distributing questionnaires to alumni of the Technical Training for Road and Bridge Preservation Supervisors. This research method is a scientific method for receiving valid information which aims to find, develop and prove certain information so that in the future it can become a reference for understanding, solving and predict a problem. To answer research questions on curriculum implementation factors, implementation stages and effectiveness of the Technical Training Program for Road and Bridge Preservation Supervisors organized by the West Java Province Human Resources Development Agency in 2022, the initial activity of researchers was to conduct a preliminary study regarding the implementation of the curriculum for the Concrete Pavement Preservation Training course then determine the method and formulation of the research problem that is formulated, namely focusing on **Concrete Mix Design *Fast Track***

1. Types and Sources of data

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The research data collection procedure uses two types of data as follows:

a. Data Primer;

b. Data Seconds

2. Data Collection Techniques

Observation, Interview, **Documentation**

3. Data Analysis Techniques

a. Validation of Concrete Pavement Preservation Module

b. Distribution of Questionnaires

c. Method *Laboratory Experimental*

4. Location and Time of Research

The location of the Concrete Testing research was carried out at the UPTD Soil and Construction Materials Testing Laboratory of the Public Works and Spatial Planning Service of Cianjur Regency which is located at Jln. Adi Sucipto No. 2 Cianjur. *Schedule* Research from preparation to implementation of trials will be carried out in November 2023 – March 2024

3. RESULTS AND DISCUSSION

1. Discussion of Validation Results

The overall validation of this research uses an approach ***Research and Development***. The development model in this research refers to the design of *Borg and Gall* (1983) explained in the operational concept of Chapter II Literature Review

Meanwhile, testing in the second step is carried out **with *teknik cloze***, and the test results are also evaluated using the cloze assessment technique which consists of three criteria: (1) the test score percentage is above 60%, meaning the module is easy to understand or independent, (2) the test score percentage is between 41-60%, then the module is included in the medium or instructional category, (3) the test score percentage is less than 40%, then the module is included in the poor or difficult to understand category or failed with the following results:

a. Participants felt that organizational resources supported the application of training knowledge, Declare Already *tranfer* road preservation science 87.1% and 17.9% not yet
b. Participants rated the training as useful in supporting their work: Very good 32.3%, good 64.5%, fair 3.2%, poor and very poor 0%
c. Participants rate impact training for organizations Very good 29.0 %, good 58.1 %, fair 12.9 %, poor and very poor 0 %
d. Participant training evaluate the need to change the approach to delivering road preservation training from virtual learning to *Blended learning* Strongly agree 61.3%, agree 25.8%, quite agree 9.7%, disagree 3.2% and strongly disagree 0%
e. Participant training evaluate it is necessary to carry out laboratory experimental observations of concrete. Strongly agree 70.97%, agree 25.8%, quite agree 3.2%, disagree 0% and strongly disagree 0%

2. Discussion of Module Improvements and Discussion of Curriculum Research Results

The discussion of module improvements needs to be juxtaposed between the old modules and the modules resulting from improvements that have been validated by the West Java BPSDM TEAM and continued by juxtaposing the current curriculum and the research results curriculum.

The advantages of the new module include the addition of SOPs for designing concrete *fast track* (attached) as explained in table 4.1 and table 4.2

Table 3. Comparison of Existing Modules and Enhanced Modules in the Concrete Pavement Preservation Module *(Rigid Pavement*)

No	Existing Module	Enhanced module
1	Short Description This training course aims to provide participants with an understanding of Concrete Pavement Preservation.	Short Description The road and bridge preservation technical training course in Module 3 (Concrete Pavement Preservation Module) aims to provide participants with an understanding of Concrete Pavement Preservation.

2	Learning outcomes: After following this training course, training participants are expected to be able to identify damage to concrete pavement and carry out appropriate maintenance of concrete pavement.	Learning outcomes : After following this training course, road and bridge preservation technical training participants are expected to be able to identify damage to concrete pavement and carry out concrete pavement maintenance and are expected to be able to create concrete designs. *Fast Track* which is in accordance with the 2018 General Specifications, 2nd revision
3	Learning Outcome Indicators After receiving this material, training participants are expected to be able to: a) Able to identify concrete pavement damage and its causes; b) Able to carry out maintenance and repair of concrete pavement according to regulations;	Learning Outcome Indicators After receiving this material, training participants are expected to be able to: a) Able to identify concrete pavement damage and its causes; b) Able to carry out maintenance and repair of concrete pavement according to regulations; *c)* Able to make Concrete Designs *Fast Track*
4	Main Material and Sub-Main Material The main material and sub-main material of this training course consists of: a) Types of Concrete Pavement Damage b) Concrete Pavement Maintenance Materials c) Concrete Pavement Maintenance Tools d) Concrete Pavement Maintenance Methods e) Concrete Pavement Maintenance Technology	Main Material and Sub Main Material This training course consists of: a) Types of Concrete Pavement Damage b) Concrete Pavement Maintenance Materials c) Concrete Pavement Maintenance Tools d) Concrete Pavement Maintenance Methods e) Concrete Pavement Maintenance Technology f) Designing Fast track concrete pavements

Table 4. Comparison of Existing Curriculum and Curriculum Research Results

No	Existing Curriculum	Research Results Curriculum
1.	2 Participant The training is ASN with the position of First Expert Road and Bridge Technical Jafung, Potential ASN or Non-ASN with potential in road preservation management within the West Java Province Department of Highways and Spatial Planning	Participant The training is for civil servants within the Department of Highways and Spatial Planning of West Java Province consisting of employee delegates in the Maintenance and Development Sector, Construction Services Sector as well as UPTD elements from Regions I to Regions VI. By education, not all training participants are from the Civil Engineering major (consisting of 19 engineering graduates, 3 engineering diplomas, the rest are non-engineering graduates),

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2.	Coaching Staff 3 Widyaiswara/Teaching Staff a. Widyaiswara/Teaching Staff are those who have taken part in Road Preservation Training; b. Have a minimum education of S1 or equivalent; c. Experience teaching in Road Preservation Technical Training and mastering the material taught; d. Able to use methods with media that are relevant to the learning objectives in accordance with the training subjects given. e. Provide role models for participants, both in terms of discipline, behavior, how to ask questions, how to provide feedback, provide motivation, and mastery of training material. Organizer/Administrative Personnel/IT Administrative staff are staff outside the teaching staff whose job is to prepare and expedite the implementation of technical training. Other Coaching Personnel Other training personnel are officials or someone who is not a Widyaiswara, not a manager of a Government Training Institute but because of their expertise, ability or position is involved in activities to achieve training objectives.	Coaching Staff Widyaiswara/competent teaching staff from BPSDM West Java Province is for local content material while Widyaiswara and Practitioners from the Center for Competency Development for Roads, Housing and Regional Infrastructure Development (Pusbangkom JPW) BPSDM Ministry of PUPR are teaching staff who have experience teaching Road Preservation Technical Training and bridges and master the material taught (certificate of competency in the field of roads and bridges) Organizer/Administrative Personnel/IT The task of the training organizer is not to first select the proposed training participants from the Department of Highways and Spatial Planning of West Java Province who are in accordance with their competencies.
	Approaches, Models, Methods, Tools and Learning Media	Approaches, Models, Methods, Tools and Learning Media
	a. Approach: Delivery of material using blended learning, namely a combination of classical and virtual learning/on the network (Online/Distance Learning). Participants are expected to be able to read and understand each subject by studying independently through the Learning Management System (LMS) before meeting virtually with widyaiswara/facilitator/teacher	a. Approach: ➢ Delivery of material using full virtual learning/ online (Online/online/Distance Learning) through the BPSDM Learning Management System (LMS) West Java Province
	b. Model Learning can use discovery learning, project based learning, cooperative learning, inquiry, contextual teaching learning, quantum teaching learning, experiential learning, or use these models effectively.	b. Model There is a need for field observations/benchmarking /field visits to locations that are being implemented

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	c. Method In accordance with the goals and objectives to be achieved, the teaching and learning process is carried out using appropriate methods	c. Method Practicum (not carried out) It is necessary to schedule a Concrete Laboratory practicum (laboratory experimental method), to determine the cement water factor, aggregate gradation, additives additive
	Adult learning (andragogy) includes, among other things: a. Talk b. Question and answer c. Material Deepening d. Case study e. Internship f. Guided Discussion g. Independent Discussion h. Assignment	
	d. Learning Tools and Media The tools or media used for the learning process are the Road Preservation Technical Training module and materials/handouts delivered by widyaiswara. Other relevant references can be used to enrich the discourse and framework, especially in understanding road preservation properly a. LMS/ Akses Internet b. Zoom Platform c. Sound System d. Recorder Audio/Visual e. Computer/ Lap-top f. Books/ Modules g. Teaching Materials h. Power Point/ Broadcast Material i. Lathan case and materials j. Other electronic-based multimedia devices	d. Learning Tools and Media Learning tools and media are necessary addition to laboratory approaches with Laboratory Experimental Methods; Preparation of a set of laboratory equipment to create Design Mix Formula (DMF) and Job Mix Formula (JMF) for concrete/rigid pavement. 45 cylinder molds for concrete samples Media Preparation; fine aggregate, coarse aggregate, sand, Type III cement, water, and substances additive (Type F: Water Reducing, High Range Admixtures (Superplasticizer)
	e. Road Preservation Supervisor Technical Training curriculum structure consists of 13 Modules General objectives and specific objectives have been explained 	e. Curriculum structure for Technical Road Preservation Supervisor Training: there are no field visits/observations/laboratories in Module 3 Concrete Pavement Preservation

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	in the previous chapter, researching the Batchingplan and field locations	

Discussion of Questionnaire Results

The author conducted research by distributing questionnaires to alumni participating in road and bridge preservation field supervisor training as well as interviews with training organizers. This is necessary to collect information on road and bridge preservation technical training curriculum studies regarding module material requirements. via the BPSDM Sister Website **http://www.bpsdmjabar.web.id/ bpsdmjabar@gmail.com**

Based on the results of research on 34 alumni respondents participating in Road and Bridge Preservation training of the 22 questions are grouped into 9 categories as shown in the diagram below

a. Trainee Profile Diagram:.

1. Education Level; 32 participants filled out the questionnaire, dominated by undergraduate graduates = 11 participants, followed by S.2 = 8 participants and D3 = 3 participants, and high school graduates = 9 participants,
2. The groups that filled out the questionnaire were 30 participants, Group IV= 1 participant, Group III= 21 participants and Group II= 8 participants
3. Positions that filled out the questionnaire were 31 participants, of which 25 participants still remained in positions and 6 participants were new positions.
4. 31 work units filled out the questionnaire, of which 27 work units remained and 4 participants were new work units.
5. 31 regional officials filled out the questionnaire, of which 30 participants were from the Bna Marga Service and 1 participant transferred to another OPD

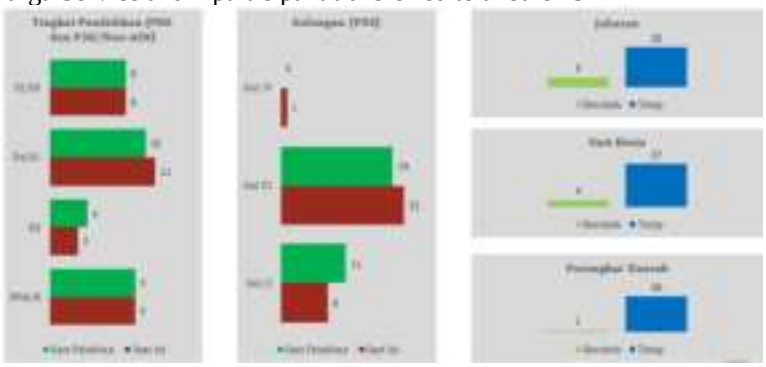

Figure 1 Training participant profile diagram

b. Participant Assignment Diagram Regarding Road Preservation

1) Still handling road preservation as much as 87.1% and 12.9 not handling road preservation 2) If still handling road preservation, training helps carry out current tasks as much as 93.3% and 6.7% said no

3) If it doesn't handle road preservation, training helps carry out current tasks as much as 83.3% and 16.7% say it doesn't

4) If it does not deal with road preservation, training is related to current tasks as much as 83.3% and 16.7% said it does not

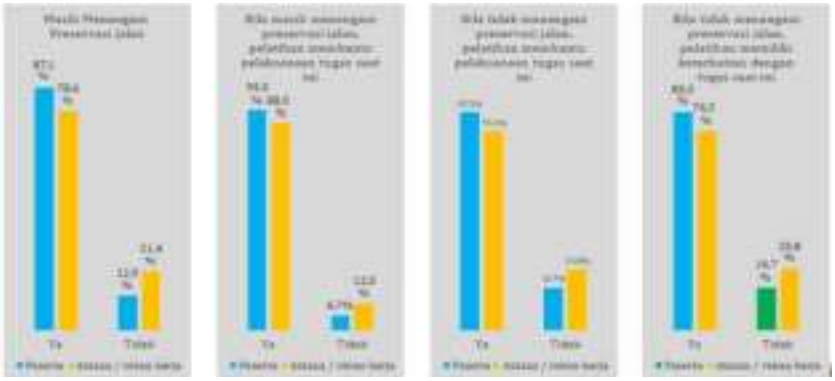

Figure 2 Diagram of participant assignments related to road preservation

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c. Road Preservation Knowledge Transfer Diagram

1) States that 87.1% of road preservation knowledge has been transferred and 17.9% have not

2) If so, knowledge transfer method; 25.8% through formal discussions (meeting invitations, attendance lists, etc.) and 74.2% through informal discussions

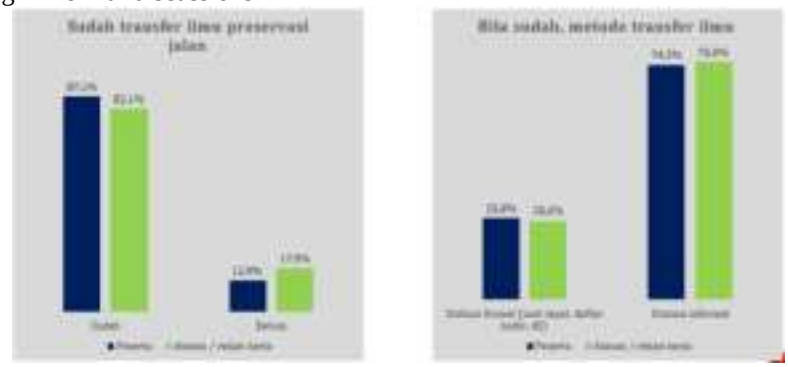

Figure 3 Road preservation knowledge transfer diagram

d. Trainee Commitment Diagram

I am committed to implementing training materials in the current work environment, which states: Very good 29.0%, good 58.1%, fair 12.9%, poor and very poor 0%

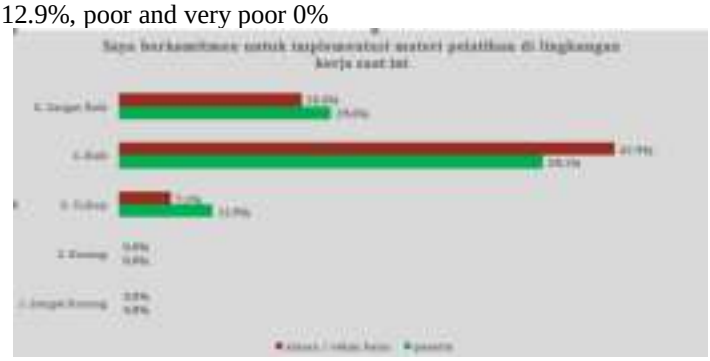

Figure 4. Diagram of training participants' commitment

e. Trainee Confidence Diagram

I understand that the resources needed to implement learning materials in the work environment are available adequately, which states: Very good 16.1%, good 38.7%, fair 38.7%, poor 3.2% and very poor 3.2 %

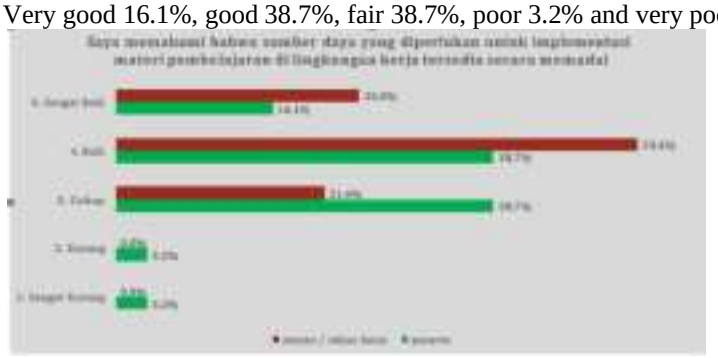

Figure 5 Diagram of training participants' self-confidence

f. Diagram of Changes in Trainee Behavior

1) I am sure that the training materialsThis is very useful in supporting my work, which stated: Very good 48.4%, good 48.4%, fair 3.2%, poor and very poor 0% 2) I am sure that the training material This is very useful in the successful implementation of my work, which stated: Very good 32.3%, good 64.5%, fair 3.2%, poor and very poor 0%

3) I am confident that the training materialsThis is very useful in completing my work

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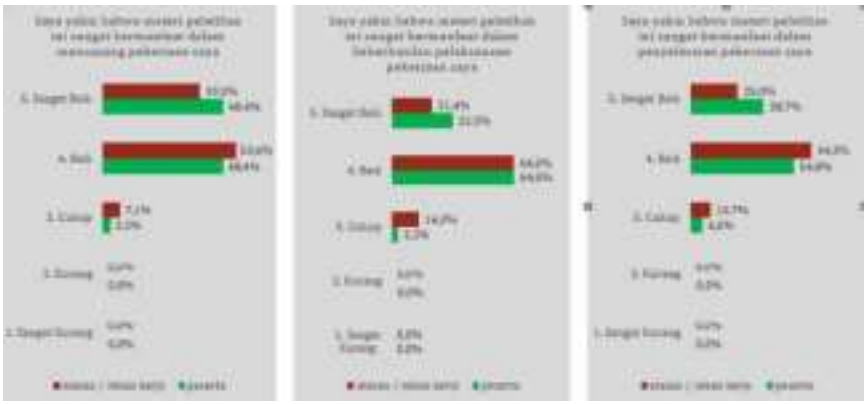

Figure 6 Diagram of changes in behavior of training participants

g. Road Preservation Training Impact Diagram

1) Impact of training to the work unit which stated: Very good 29.0%, good 58.1%, fair 12.9%, poor and very poor 0%

2) Impact of training towards theoretical knowledge or concepts of alumni, which stated: Very good 16.1%, good 67.7%, fair 12.9%, poor 3.2% and very poor 0%

3) Impact of training to increase in productivity which states: Very good 22.6%, good 61.3%, fair 16.1%, poor and very poor 0%

4) The impact of training on improving the quality of work results which states: Very good 25.8%, good 61.3%, fair 12.9%, poor and very poor 0%

5) The impact of training on increasing customer satisfaction which states: Very good 25.8%, good 58.1%, fair 16.1%, poor and very poor 0%

6) The impact of training on strengthening relationships between co-workers, which states: Very good 29.0%, good 64.5%, fair 6.5%, poor 0% and very poor 0%

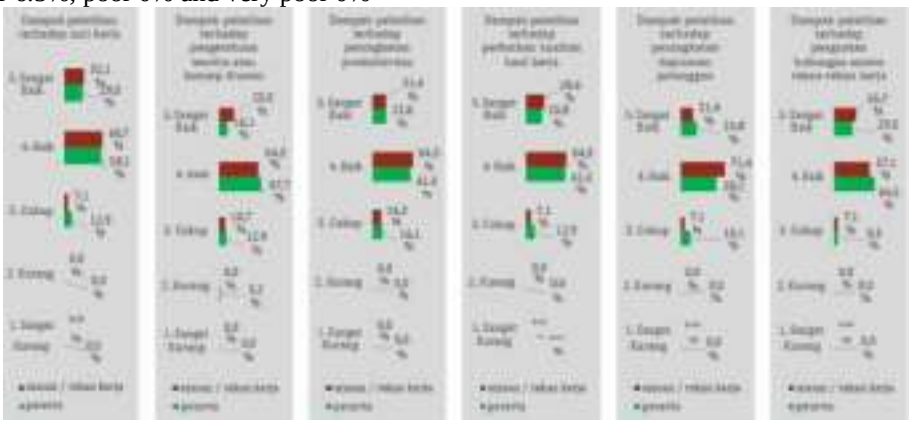

Figure 7 Diagram of the impact of road preservation training

h. Approach Diagram for Delivery of Technical Training Materials for Road and Bridge Preservation Supervisors

There is a need to change the approach to delivering material for Technical Training for Road and Bridge Preservation Supervisors from using virtual learning to blended learning which is needed to achieve learning optimization, approaches, models, methods, tools and learning media used which states: Strongly agree 61.3%, agree 25 .8%, quite agree 9.7%, disagree 3.2% and strongly disagree 0%

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Figure 8. Diagram of approach to delivering road preservation training material

i. Diagram of Laboratory Experimental Methods for Technical Training for Road and Bridge Preservation Supervisors

The need for observation includes direct observation of the subject under study so that participants work together and communicate actively, identify, discuss and solve problems that are the topic by carrying out concrete pavement laboratory experiments, which states: Strongly agree 70.97%, agree 25.8 %, quite agree 3.2%, disagree 0% and strongly disagree 0%

Figure 9. Diagram of laboratory experimental methods for road preservation training

j. Concrete Mechanical Properties Test Results

After making and treating the test object, the compressive strength test of the test object is then carried out. Concrete compressive strength testing in this research was carried out on test objects aged 1, 3, 7 days with the expected compressive strength when aged 7 days planned (f'c) of 36 MPa for 45 samples using the SNI 03-1974-2011 method, which consists of five variations of the addition of substances *additive*. For each variation, 3 samples were made for the compressive strength of each variation by adding substances *additive* (Type F: *Water Reducing, High Range Admixtures* (*Superplasticizer*) of 0.0%, 0.6%, 0.8%, 1.0%, 1.2% of the cement weight. Compressive strength concrete is calculated by the equation:

$$fc' = \frac{P}{A}$$

Where:

fc'= concrete compressive strength (MPa)

P = maximum load weight (N)

A = surface area of the test object (mm^2)

The complete results of concrete compressive strength calculations for age variants are presented in table 4.8. – 19. And figure 4.9. – 4.12.

The complete results of concrete compressive strength calculations for age variants are presented in table 4.8. – 19. And figure 4.9. – 4.12.

Table 5 Results of the 4.8 compressive strength test for normal concrete aged 1 day

No	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Flat flat (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(Mpa)	

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1	Normal	15x30	13,02	1	239	24345,73	13,51	
2	Normal	15x30	13,14	1	256	26130,23	14,50	13,70
3	Normal	15x30	12,94	1	231	23580,94	13,09	

Source: Test Results

Table 6 Compressive strength test results for normal concrete aged 3 days

No	Object Code	We are waiting r	Heavy	Age	Maximum Load		Fc'	Flat flat (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	Normal	15x30	13,26	3	410	41808,35	23,2	
2	Normal	15x30	12,94	3	347	35435,14	19,66	22,75
3	Normal	15x30	13,20	3	449	45759,75	25,40	

Source: Test Results

Table 7 Compressive strength test results for normal concrete aged 7 days

No	Object Code	Cylinder	Heavy	Children r	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	Normal	15x30	12,84	7	404	41171,04	22,85	
2	Normal	15x30	13,26	7	531	54172,41	30,08	25,16
3	Normal	15x30	13,24	7	399	40661,18	22,58	

Source: Test Results

Table 8.Test results for compressive strength of 0.6% additive concrete aged 1 day

	Object Code No	Cylinder	Heavy	Age	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.01	15x30	13,44	1	200	20394,33	11,31	
2	AD.01	15x30	13,4	1	240	24473,19	13,59	11,01
3	AD.01	15x30	13,26	1	144	14658,41	8,14	

Source: Test Results

Table 9 Test results for compressive strength of 0.6% additive concrete aged 3 days

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No	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.01	15x30	13,08	3	491	50093,55	27,80	
2	AD.01	15x30	13,14	3	451	46014,69	25,54	26,45
3	AD.01	15x30	13,23	3	460	46906,94	26,04	

Source: Test Results

Table 10 Results of additive concrete compressive strength tests 0.6% age 7 days

Nthe	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.01	15x30	13,02	7	736	75049,61	41,65	
2	AD.01	15x30	13,02	7	665	67751,20	37,61	**38,90**
3	AD.01	15x30	13,44	7	660	67433,82	37,44	

Source: Test Results

Table 11 Test results for compressive strength of 0.8% additive concrete aged 1 day

No	Object Code	Cylinder	Heavy	Age	Maximum Load	Fc'	Rate-rate	
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	(MPa)
1	AD.02	15x30	12,96	1	236	24090,79	13,38	
2	AD.02	15x30	12,94	1	249	25365,44	14,08	12,00
3	AD.02	15x30	12,86	1	151	15423,20	8,56	

Source: Test Results

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Table 12 Compressive strength test results for 0.8% additive concrete aged 3 days

Nthe	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.02	15x30	13,26	3	428	43592,86	24,20	
2	AD.02	15x30	13,8	3	488	49711,15	27,60	26,58
3	AD.02	15x30	13,8	3	494	50348,48	27,95	

Source: Test Results.

Table 13 Results of additive concrete compressive strength tests 0.8% age 7 days

No	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Rate-rate (MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.02	15x30	13,06	7	628	64033,18	35,54	
2	AD.02	15x30	13,12	7	637	65036,31	36,11	**37,50**
3	AD.02	15x30	13,08	7	721	73562,82	40.83	

Source: Test Results

Table 14 Test results for compressive strength of 1.0% additive concrete aged 1 day

No	Object Code	Cylinder	Heavy	Age	Maximum Load		Fc'	Installment-Instalment(MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.03	15x30	13,10	1	218	22178,83	12,25	
2	AD.03	15x30	13,08	1	280	28552,05	16,01	14,09
3	AD.03	15x30	13,36	1	248	25237,98	14,00	

Source: Test Results

Table 15 Test results for compressive strength of 1.0% additive concrete aged 3 days

No	Code Things	Cylinder	Heavy	Age	Maximum Load		Fc'	Installment-Instalment(MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.03	15x30	13,06	3	559	56976,64	31,63	
2	AD.03	15x30	13,26	3	505	51495,66	28,59	29,21
3	AD.03	15x30	13,18	3	485	4946,24	27,45	

Source: Test Results

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Table 16. concrete compressive strength test results *additive* 1.0 % age 7 days.

No	KodeBenda	Cylinder	Heavy	Age	Maximum Load		Fc'	Installment-Instalment(MPa)
	Test		(Kg)	(day)	(kN)	(Kg)	(MPa)	
1	AD.03	15x30	13,04	7	646,71	65945,56	36,61	
2	AD.03	15x30	13,26	7	632,03	64449,62	35,79	35,57
3	AD.03	15x30	13,00	7	606,36	61831,74	34.33	

Source: Test Results

Table 17. Concrete compressive strength test results *additive* 1,2 % age 7 days

No	Test Object Code	Form of the Test Object	Strong Press Kg/Cm2	Compressive strength Average (Kg/Cm2) - MPa	Information
1	AD.04	Cube 15x 15	343,7	356,05 - 34,93	Convention to Cylinder 15/30= 0,85 x 34,93 = **29,69 MPa**
2	Ad.04	Cube 15x 15	368,4		

Source: Test Results

D. Conclusion & Suggestion

1. Conclusion;

From the results of this research, improvements need to be made as follows:

a. Systematic Learning Curriculum on:

1) Submission of original material using media *full virtual learning* through the West Java BPSDM LMS it becomes a medium *blended learning* (Virtual and Classical)

2) Learning methods need to be implemented *Observation* field/ *Bechmarking*/ laboratory experimental

b. Improving Technical Training Materials for Road and Bridge Preservation Supervisors in the Concrete Pavement Preservation Module;

1) Validation of the Concrete Pavement Preservation Module

2) There is a Fast Track Concrete Mix Design (Mix Formula Design and Job Mix Formula) 3) There is an additional SOP for Fast Track Concrete (rigid pavement) 7 days Oven Traffic (attached)

2. Recommendations

Based on the results of identification through the implementation of curriculum studies and the formulation of clear, specific research objectives both in the form of observations and measured in the field, the results of concrete laboratory trials *Fast Track* in the Concrete Pavement Preservation Module suggests

a. Improving the Road and Bridge Preservation Technical Training material in the Concrete Pavement Preservation Module must be validated first and requires preparation of new curriculum regulations, as well as improvements in implementation. Evaluation and study of the module was carried out by the West Java Province BPSDM TEAM and the Quality Assurance Team.
b. In learning material for the Concrete Pavement Preservation Module, it is necessary to add an Experimental Laboratory time schedule with teaching staff/practitioners in the field of concrete pavement in collaboration with the Pusbangkom for roads, settlements and regional infrastructure, BPSDM, Ministry of PUPR
c. The implementation of the 7 day Oven Traffic Fast Track Concrete (rigid pavement) SOP will have an impact on improving employee performance with the following details:

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