

Traffic Light Maintenance Training at The Transportation Office of Kulon Progo Regency

HELMI WIBOWO, RIZA PAHLEVI, HANIF ADHI YUDHITAMI, DHI ASTUTI

Program Studi Teknologi Otomotif, Politeknik Keselamatan Transportasi Jalan

Email : helmi.wibowo@pktj.ac.id

Received 20 May 2022 | Revised 27 May 2022 | Accepted 31 May 2022

ABSTRACT

In traffic regulation, Maintenance of Traffic Light Signaling Devices (APILL) is a competency that must be possessed by every employee of the Department of Transportation, so that every APILL at road intersections is able to regulate the speed of vehicles in an orderly manner. The method used was to provide education and training to employees of the Kulonprogo Department of Transportation for 5 (five) days. To measure the level of understanding of the training participants, pre-test and post-test were conducted. The average value of pre-test and post-test was 68 and 83 with an average increase of 16%. The conclusion of the APILL Maintenance Training at the Transportation Office of Kulon Progo Regency is said to be successful as indicated by the increase of the post test scores of all training participants. This shows the training participants understand the material well.

Keywords: Training APILL, Pre Test, Post Test.

1. INTRODUCTION

Transportation plays an important role in economic growth, especially urban areas. This is because transportation is related to production, consumption, and distribution activities. The government needs to prioritize the importance of transportation to facilitate economic activities.

The population growth in Kulon Progo Regency, although still below the national growth rate, is still showing a significant growth rate. Based on the Population and Civil Registry data of DIY, the total population of Kulon Progo Regency in 2021 is 442,874 people. Meanwhile, in 2020 the number is 443,003 people. The average population growth rate of Kulon Progo Regency is 0.03%. This figure is still below the national growth rate of 1.6%. (**Ditjen Dukcapil Kemendagri, 2021**)

The increase in population is also accompanied by the growth of vehicles. Referring to the Central Statistics Agency for Kulon Progo Regency, in 2017 there were 149,578 vehicles, while in 2017 there were 194,387 vehicles. There was an increase in the number of vehicles by 23.05% over a period of 5 years. (**Badan Pusat Statistik Kabupaten Kulon Progo, 2017**)

The number of vehicles that continues to increase every year, it is necessary to regulate traffic on the highway so that the vehicle speed on the highway remains conducive, one of the road equipment that must be in prime condition is the Traffic Signaling Device (APILL), because

good APILL settings will make coordination at each leg of the intersection went well. On the other hand, a bad APILL arrangement will make coordination at each leg of the intersection not good or in other words, cause traffic jams. (**Radityo, dkk, 2022**)

In maintaining APILL, good employee competence is needed in order to minimize the error factor when working, the Transportation HR Development Agency (BPSDMP) always pays attention to the competence of Transportation human resources, this is in line with the vision and mission of BPSDMP and the Kulon Progo Regency Transportation Service, namely the Realization of Human Resources Excellent, Professional and Ethical Transportation in providing reliable and Zero Accident Transportation. (**Renstra BPSDMP 2020-2024**)

In realizing excellent Transportation Human Resources in providing services to the community, BPSDMP through the Tegal Road Transportation Safety Polytechnic provided APILL Maintenance Education and Training to 30 employees of the Kulon Progo Regency Transportation Service for 5 (five) days. The material consists of Theory and Practice for 50 Hours of Lessons ranging from Legislation on APILL, APILL Basic Principles, APILL Operation, APILL Troubleshooting, and APILL Maintenance.

2. METHOD

The learning method used in this education and training uses an Andragogy approach, namely adult education, using Lectures, Questions and Answers, Discussions, Case Studies and Simulation methods. To measure the level of understanding of the training participants, the pre-test and post-test were used.

A long journey about the birth of the term andragogy in the world of education, but thoughts that are more focused both in terms of theoretical concepts, philosophy and at the implementation stage (methodology) as in; the learning process, learning objectives, learning objectives and the link between andragogy and pedagogy began in 1950: where Malcolm Knowles compiled the book 'Informal Adult Education' which stated that the essence of adult education is different from traditional education. The condition of adults in learning is different from that of children. If children use the term "pedagogy" so that it means "the art and science of teaching children" or the science and art of teaching children. So andragogy is more defined as the science and art of guiding or helping adults learn "the art and science of helping adult learn". According to his view, why there is a difference between the learning activities of children and adults, this is because adults have: 1) The self-concept, 2) Life experience (The role of the learner's experience); 3) Readiness to learn, 4) learning orientation (Orientation to learning); 5) The need for knowledge, and 6) Motivation. With these assumptions, andragogy is a science that underlies the development of non-formal education and formal education today. (**Saifuddin & Mustofa, 2010**)

APILL Maintenance Education and Training was given to 30 participants from the Kulon Progo Regency Transportation Service employees, participants who took part in the APILL maintenance training and education were field implementers who had the task and function of maintaining road equipment such as street lighting maintenance and APILL aspect lamp maintenance in the area. Kulon Progo Regency. Learning consists of theory and practice with a total of 22 hours of theory lessons and 28 hours of practical lessons with a minimum score of 70. (**Silabus dan Petunjuk Teknis Diklat, 2021**)

The learning method used in this education and training uses an Andragogy approach, namely adult education, using the Lecture, Question and Answer, Discussion, Case Study and Simulation methods. To measure the level of understanding of the training participants, it was carried out using a pre test and post test.

Tabel 1. APILL Maintenance Training Curriculum

No	Course	Lesson hours	
		Theory	Practice
1	Ministerial Regulation No. 49 of 2014 concerning the Basic Principles of the APILL Intersection	5	0
2	APILL Basic Principles a. APILL Main Components b. Direct Current (DC) and Alternating Current (AC) Electrical Circuits c. APILL Installation Network and Power Supply System d. APILL Technology	4	3
3	APILL Operation a. Wiring 4 group signal a. Programming 2 phase, 3 phase and 4 phase (Time Set, Plan, and Schedule)	5	5
4	APILL troubleshooting a. Troubleshooting Traffic Light Controller b. Troubleshooting Aspect Lights c. Cable Network Troubleshooting	4	10
5	APILL maintenance a. Periodic Maintenance <ul style="list-style-type: none"> • Daily Routine Maintenance • Weekly Routine Maintenance • Monthly Routine Maintenance b. Incidental Maintenance <ul style="list-style-type: none"> • Maintenance of New Components • Cycle Time Adjustment 	4	10
Sub Total		22	28
Total		50 JP	

Table 1 is the Education and Training curriculum which was carried out for 5 days. Learning consists of theory and practice, theory is carried out for 3 days in class and practice for 2 days which includes 1 day field survey and 1 day APILL simulation with APILL simulator. The following stages of APILL maintenance education and training are listed in table 2.

Tabel 2. Activity Stages

Day Activities	Activity	Activity Output
Day 1	1. Submission of Legislation Material on APILL 2. APILL Basic Principles	Understanding of the Laws and Basic Principles of APILL
Day 2	Understanding APILL Operation	Understanding APILL Operation
Day 3	APILL troubleshooting APILL maintenance	Understanding APILL Problems and Repairs
Day 4	Survey Arus Lalu Lintas pada Simpang UNY	Understand and be able to analyze the flow of vehicles at each intersection
Day 5	Praktek Pengaturan APILL	Understand and be able to analyze the determination of the red, yellow and green color lights

Table 2 is the stage of community service activities with APILL Maintenance Training and Education which consists of theoretical and practical material. By participating in the training stages for 5 (days) it is hoped that participants will be able to understand and analyze APILL maintenance in accordance with the activity output targets.

3. RESULTS AND DISCUSSION

The training participants came from employees from the Transportation Service of Kulonprogo Regency as many as 30 people, the material was delivered for 5 (five) days with 50 lesson hours consisting of theory and practice, namely 22 hours and 28 hours. Theoretical material is delivered by lecture and discussion methods in class, while practical material is delivered by survey method to the location of the APILL intersection in the Kulonprogo area, the APILL intersection which is used as a practice place is at the APILL UNY intersection with 4 intersections, as well as to complete the knowledge of the latest training participants simulation is carried out with the APILL simulator to input the results of survey data to determine the delay of the red, yellow and green lights.

1. Delivering Material in Class

Submission of materials in the form of regulations and laws related to APILL, namely Law No. 22 of 2009 concerning Road Transport Traffic, Minister of Transportation Regulation No. 49 concerning Traffic Signaling Equipment (APILL), Regulation of the Directorate General of Land Transportation SK.7234/AJ.401/DRJD/2013 regarding Technical Instructions for Road Equipment, and Regulation of the Directorate General of Land Transportation SK.4303/AJ.002/DRJD/2017 concerning Technical Instructions for Maintenance of Road Equipment. (**Peraturan Perundangan**)



Figure 1. Delivering Material in Class

Figure 1 shows the activity of delivering theoretical material in class to training participants.

2. Practice with surveys

In this survey activity, participants were invited to see the condition of traffic flow, the place that was used as the survey location was the 4 UNY intersection in Kulon Progo district which is 4 km from the Kulon Progo Regency Transportation Office. The purpose of looking at traffic flow conditions is to see the number of vehicles, types of vehicles, road width, road slope, side obstacle adjustment factors, Lost Time Intersection (LTI) to capacity and degree of saturation. The results of the survey were then analyzed based on the 1997 Indonesian Road Capacity Manual (MKJI). (**MKJI, 1997**)



Figure 2. Survey Activities at Intersection 4 UNY

3. Practice with APILL Simulator

To complete the knowledge of the training participants after obtaining theoretical and practical material on field surveys, the training participants then input the data that has been obtained into the APILL simulator, the input data is the time delay in red, yellow and green lights.



Figure 3. APILL Simulator Practice

In Figure 3, it can be seen that the training participants tried to practice with the APILL simulator, the students were very enthusiastic in trying the APILL simulator.

4. Achievement of Understanding of the Training Materials

To measure the level of understanding of the training participants, at the beginning before the training begins, the training participants are given pre-test questions to determine the level of understanding of the training participants towards the APILL Maintenance Training material, and after the training participants have attended the provision of material both theory and practice, the training participants are given post-test questions. to see the extent of understanding of the training participants in understanding the APILL Maintenance Training material.

Table 3. Achievement of APILL Maintenance Training Materials

No	Course	Minimum Value Standard	Learning Achievement
1	Ministerial Regulation No. 49 of 2014 concerning the Basic Principles of the APILL Intersection	70	achieved
2	APILL Basic Principles	70	achieved
3	APILL Operation	70	achieved
4	APILL troubleshooting	70	achieved
5	APILL maintenance	70	achieved
As many as 30 participants have met the minimum score standard			

The training participants understand all the material that has been given by getting a score above the minimum standard value as shown in table 3.

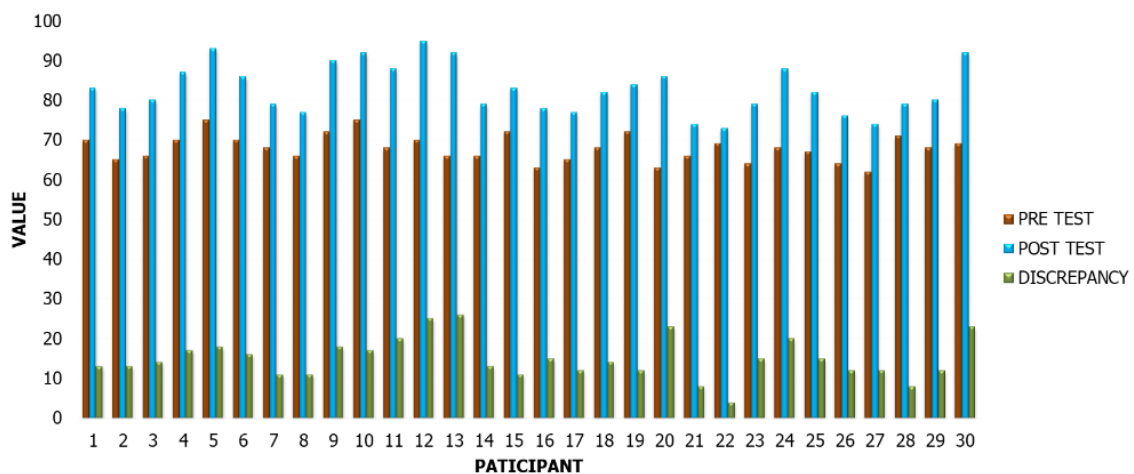


Figure 4. Value of Pre Test, Post Test and Discrepancy

From Figure 4, it can be seen that the pre-test and post-test results of the training participants, the average pre-test and post-test scores were 68 and 83, of the 30 training participants, all experienced an increase, with a percentage increase of 16%.

4. CONCLUSIONS

Employees of the Kulonprogo Regency Transportation Office have participated in APILL Maintenance Training activities well, with results that exceed the minimum standard value. With this competency, it is hoped that APILL in Kulon Progo Regency will always be in good condition so that an orderly and conducive traffic condition is created.

ACKNOWLEDGEMENT

Thank you to the Ministry of Transportation, especially the Road Transportation Safety Polytechnic which always provides Education and Training to the Community to always improve Competence to improve excellent service.

LIST OF REFERENCES

- Badan Pengembangan SDM Perhubungan. (2020). *Rencana Strategis Badan Pengembangan SDM Perhubungan Tahun 2020 – 2024*. Jakarta.
- Badan Pusat Statistik. (2017). *Jumlah Kendaraan Kabupaten Kulon Progo*. 2017. Indonesia : Badan Pusat Statistik Kabupaten Kulon Progo.
- Ditjen Dukcapil Kemendagri. (2021). *Jumlah Penduduk Kabupaten Kulon Progo 2021*. Indonesia: Biro Tata Pemerintahan Sekretaris Daerah DIY.
- Direktorat Bina Jalan Kota. Direktorat Jenderal Bina Marga. (1997). *Manual Kapasitas Jalan Indonesia (MKJI)*. Jakarta.
- Peraturan Menteri Perhubungan Nomor PM. 49 tahun 2014 tentang *Alat Pemberi isyarat Lalu Lintas*.
- Peraturan Direktur Jenderal Perhubungan Darat Nomor SK.7234/AJ.401/DRJD/2013 tentang *Petunjuk Teknis Perlengkapan Jalan*.
- Peraturan Direktur Jenderal Perhubungan Darat Nomor SK.4303/AJ.002/DRJD/2017 tentang *Petunjuk Teknis Pemeliharaan Perlengkapan Jalan*.
- Mustofa, K. (2010). *Andragogi*. Pendidikan Luar Sekolah Universitas Pendidikan Indonesia. Bandung.
- Radityo, dkk. (2022). Evaluasi Kinerja Apill (Alat Pemberi Isyarat Lalu Lintas) Di Kota Semarang (Studi Kasus Di Jalan Dr. Cipto Semarang Sepanjang 2,8 Km Saat Jam Puncak Keramaian). *Jurnal Mahasiswa Teknik Sipil, Fakultas Teknik, Universitas Katolik Soegijapranata*. Semarang.
- Saifuddin, M. (2010). *Andragogi Teori Pembelajaran Orang Dewasa*. Fakultas Dakwah IAIN Raden Intan Lampung.
- SK Direktur PKTJ No 352. (2021). *Petunjuk Teknis Pendidikan dan Pelatihan Pemberdayaan Masyarakat Perawatan dan Pemeliharaan APILL. Politeknik Keselamatan Transportasi Jalan*. Tegal
- Undang-undang No. 22 tahun 2009 tentang *Lalu Lintas Angkutan Jalan*.