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Post-Training Evaluation of Electrical Power Inspectors at PPSDM Kebtke Based on Kirkpatrick Model Level 1 and Level 2

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ABSTRACT

This research evaluates the effectiveness of a post-training program for electricity inspectors at PPSDM KEBTKE using the Kirkpatrick Evaluation Model (level 1: reaction and level 2: learning) in the Technical Training on Power Plant Inspection for Junior Level. At level 1, participants gave positive feedback, with the training receiving an average score of 89.21, highlighting strengths in content, pre-test/post-test alignment, and participant services. However, scheduling and duration were identified as weaknesses. The Public Satisfaction Index (IKM) showed excellent results with a score of 3.60, particularly in staff behavior, competence, and product specifications. Participants' reactions toward instructors were also excellent, scoring 90.25, with motivation, material quality, and methods as strengths, though variation in material delivery needs improvement. At level 2, learning outcomes significantly improved, with pre-test and post-test scores showing a t-count of 4.575, greater than the t-table value of 2.01537 at a significance level of 0.05 with 14 degrees of freedom. This result indicates that there is a significant difference in participants' learning outcomes before and after training. In conclusion, the training not only received positive feedback from participants but also significantly enhanced their technical competencies. However, improvements in scheduling and instructional methods are recommended to further optimize the training quality.

Keywords: *Training Evaluation; Kirkpatrick Model; Reaction Level; Learning Level; Electricity Inspector; PPSDM KEBTKE*

INTRODUCTION

Electricity is one of the strategic sectors in national development that plays an important role in encouraging economic growth and improving the nation's welfare. This vital role requires professionals with high competence, including electricity inspectors (BAI et al., 2024; Jennings, 2019, 2020; Kannan & Garad, 2021). Inspectors have the responsibility to ensure that electricity installations and infrastructure meet the rules of safety, reliability, environmental friendliness, and are safe for the community, as mandated in Law Number 30 of 2009 concerning Electricity and Regulation of the Minister of Energy and Mineral Resources Number 10 of 2021.

To support this role, the Ministry of Energy and Mineral Resources (ESDM) through PPSDM KEBTKE organizes a training and debriefing program to improve the competence of the State Civil Apparatus (ASN) in the field of electricity (Sedayu & Pudjiarti, 2023; Setyawati et al., 2024; Umam et al., 2019). This aligns with national policies as stated in Law Number 20 of 2023 concerning ASN and Ministerial Regulation of PANRB Number 1 of 2023, which require every ASN to carry out competency development on an ongoing basis. Thus, training is an important instrument to ensure that the technical, managerial, and socio-cultural competencies of civil servants can develop according to the demands of the position, including for electricity inspectors (Artnetti & Hasan, 2023; Stepanivna, 2019; Sudarman, 2018; Zin, 2022).

However, the success of the training program is not only measured in terms of implementation, but also in terms of the extent to which the training provides real benefits to the participants (Baldwin et al., 2017). Therefore, an evaluation model is needed that can provide

a comprehensive picture of the effectiveness of training (Ambu-Saidi et al., 2024; Rafiq, 2015; Sitzmann & Weinhardt, 2019). One of the most widely used models globally is the Kirkpatrick Evaluation Model. At Level 1 (Reaction), the evaluation focuses on participants' responses, satisfaction, and perceptions of the training implementation. Meanwhile, at Level 2 (Learning), the evaluation is directed at the extent to which participants have improved their knowledge, skills, and attitudes after participating in the training (Alsalamah & Callinan, 2021; Castro et al., 2018; Jamshidi et al., 2021; Portela Dos Santos et al., 2022).

Previous research has highlighted the importance of systematic training evaluation. Studies such as Fakhruddin (2022) have applied the Kirkpatrick model to evaluate training programs, demonstrating its effectiveness in assessing participant satisfaction and learning outcomes. Similarly, Hati (2023) utilized pre-test and post-test comparisons to measure knowledge improvement among training participants, reinforcing the value of objective assessment at the learning level. Tamsuri (2022) conducted a literature review confirming the widespread adoption and adaptability of the Kirkpatrick model in the Indonesian context. These studies collectively affirm the model's relevance but also point to a gap in its application specifically within technical training for electricity inspectors at PPSDM KEBTKE, where a focused evaluation integrating both reaction and learning levels is still needed.

By evaluating training and debriefing using the Kirkpatrick Level 1 and Level 2 model, PPSDM KEBTKE can obtain objective information related to the quality of training implementation, as well as measure the improvement of participants' competencies. Therefore, this study aims to evaluate the effectiveness of the Technical Training on Power Plant Inspection for Junior Level at PPSDM KEBTKE based on the Kirkpatrick Model at Level 1 (Reaction) and Level 2 (Learning), and to provide empirical data and recommendations for enhancing the quality and impact of future training programs. The results of this evaluation are expected to serve as the basis for continuous improvement of the design, methods, and training materials, to truly support the achievement of the strategic goal of developing electricity human resources in Indonesia.

METHOD

This research was conducted at the Center for Human Resource Development of Electricity, New Energy, Renewable Energy, and Energy Conservation (PPSDM KEBTKE) with a time allocation from July 2024 to July 2025. The object of this research focuses on the training of electricity inspectors which includes the first, young, and intermediate levels. This study aims to analyze various aspects related to the effectiveness of training and its impact on improving participants' competencies in the field of electricity.

The research method for evaluating the existing electricity inspector training program aims to evaluate the effectiveness of the training program using a *mixed approach* that combines quantitative and qualitative techniques. This training evaluation aims to understand the extent to which the training program is successfully achieving the set objectives, identify the strengths and weaknesses of the program, and provide recommendations for future improvement. The research method used is the Kirkpatrick Evaluation Model by presenting data into four classes, namely reaction, learning, behavior change, and also results or impacts, but in this study the researcher took data related to level 1 and level 2 about reaction and learning.

The data in the Evaluation of the Electricity Inspector Training Program study consists of quantitative and qualitative data related to the evaluation of the electricity inspector training program which includes:

1. Data on the implementation of training
2. Evaluation data on the community satisfaction index
3. Data Eveluasi widyisawara
4. Trainee evaluation data

Quantitative data analysis in this study was carried out using descriptive analysis techniques. Data were obtained from the results of questionnaires related to participants' reactions, participants' learning outcomes, changes in participants' behavior, and the effect of training on institutions. Descriptive analysis is used to describe the general tendency of participants' responses through the calculation of percentages, averages, and score distributions. In addition, statistical tests in the form of t-tests are also used to determine the difference in results before and after training, as well as correlation analysis to see the relationship between participants' reaction variables, learning outcomes, behavioral changes, and their impact on the institution. To assess the impact (result) of the training, a scoring process is carried out based on a predetermined range of values. The score was qualified in four categories, namely Very Good (90.00 ≤ ≤ score of 100), Good (80.00 ≤ < score of 90.00), Fairly Good (70.00 ≤ score < 80.00), and Less (score < 70).

The steps in conducting an evaluation at the reaction level are:

1. Make a list of evaluation items that include all aspects related to the implementation of the training program, such as participant satisfaction with the training material, the quality of the instructors, the quality of consumption, the facilities provided, and the performance of the committee in organizing the event.
2. Design a reaction evaluation using a quantitative method, such as the Likert scale, that allows participants to provide numerical assessments, but still leaves room for additional comments or suggestions.
3. When conducting a reaction assessment, be sure to ask for feedback from participants on suggestions for improvements that can be applied to the next training program, to improve the quality of future training.
4. Keep the identity of participants confidential so that they feel comfortable giving honest responses without worry.
5. Conduct an evaluation at the end of the training program so that the results obtained can reflect the participant's overall experience and are not affected by temporary factors.

The procedures for carrying out evaluations at the *learning* level include:

1. Conduct an evaluation to assess participants' improved knowledge, skills, and attitude changes by comparing pre- and post-training conditions to measure the effectiveness of the training as a whole.
2. Use written tests to gauge participants' knowledge and attitudes, which can provide an overview of their understanding of the material being taught.
3. Use performance tests to assess the skills participants have acquired, by observing their ability to practice the skills they have learned during the training.
4. Based on the results of these measurements, take appropriate action, such as confirming the results of the evaluation at the reaction level. This aims to identify whether there are

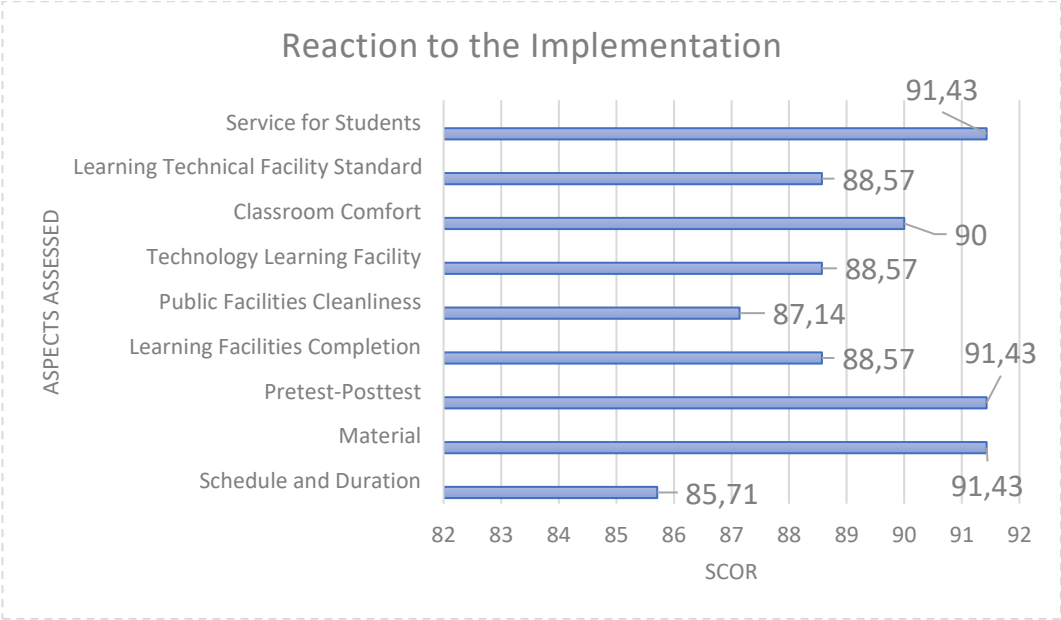
communication problems from the teacher, incompatibility with the learning strategy with the participants' expectations, or other factors that may cause the participant to feel demotivated during the learning process.

RESULTS AND DISCUSSION

A. Kirkpatrick Evaluation of the Reaction Stage to the Implementation of Technical Training for Electricity Generation Inspection at the Youth Level 26 February 2024

a. Reaction to the Implementation

From the graph below, it can be seen that the scores regarding the reaction of the technical training participants of the young level power generation inspection to the implementation carried out were 14 training participants with the highest score range of 91.43 which came from the material aspect, the aspect of Pre-Test and Post-Test suitability, and service to the participants. Meanwhile, the lowest aspect is found in the schedule and duration of the event with a score of 85.71. So it is known that the implementation of the technical training for electricity generation inspection participants at the young level is included in the Good qualification (80-90) with an average overall score of 89.21.



Excellent Score: 90-100; Good: 80-90; Fairly Good : 70-80 Less : <70

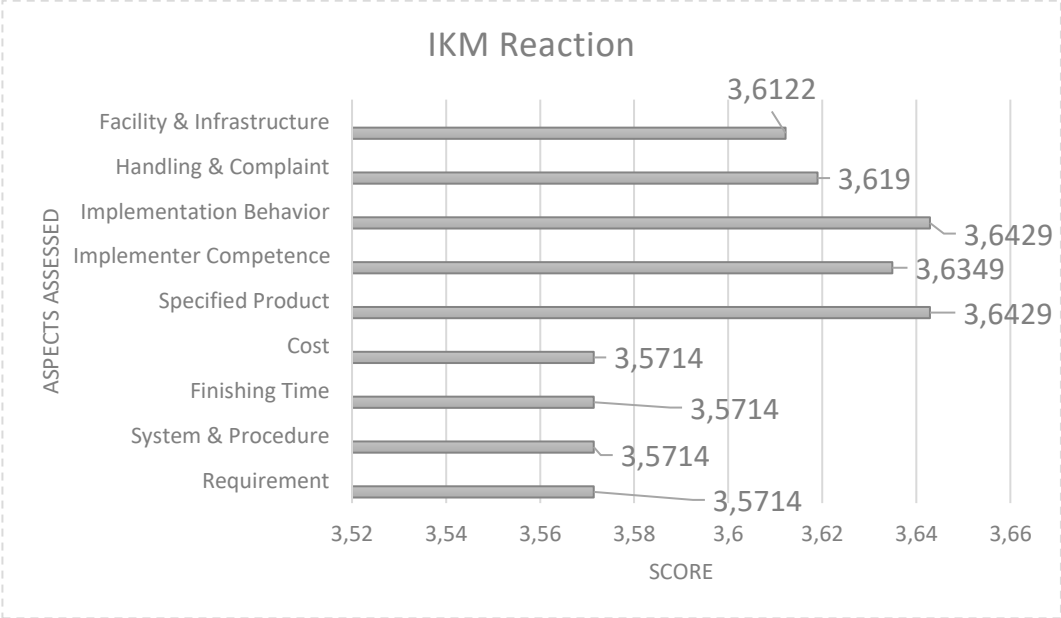
Figure 1. Participants' Reactions to the Implementation of Electrical Power Inspection Training at the Youth Level 26 February 2024

Source: Primary data analysis (2024)

b. Reaction of the Community Satisfaction Index (IKM)

From the data graph below, it can be seen that the score regarding the reaction of technical training participants in the youth power generation inspection to the community satisfaction index (IKM) carried out as many as 14 training participants had the highest score range of 3.64 which came from the aspects of implementer behavior, implementation competence, and product specifications. While the other aspects are still above 3.5. So it is known that the community satisfaction index (IKM) for young generation inspection

technical training participants is included in the "Very Good" qualification with an average overall likert scale score of 3.60.



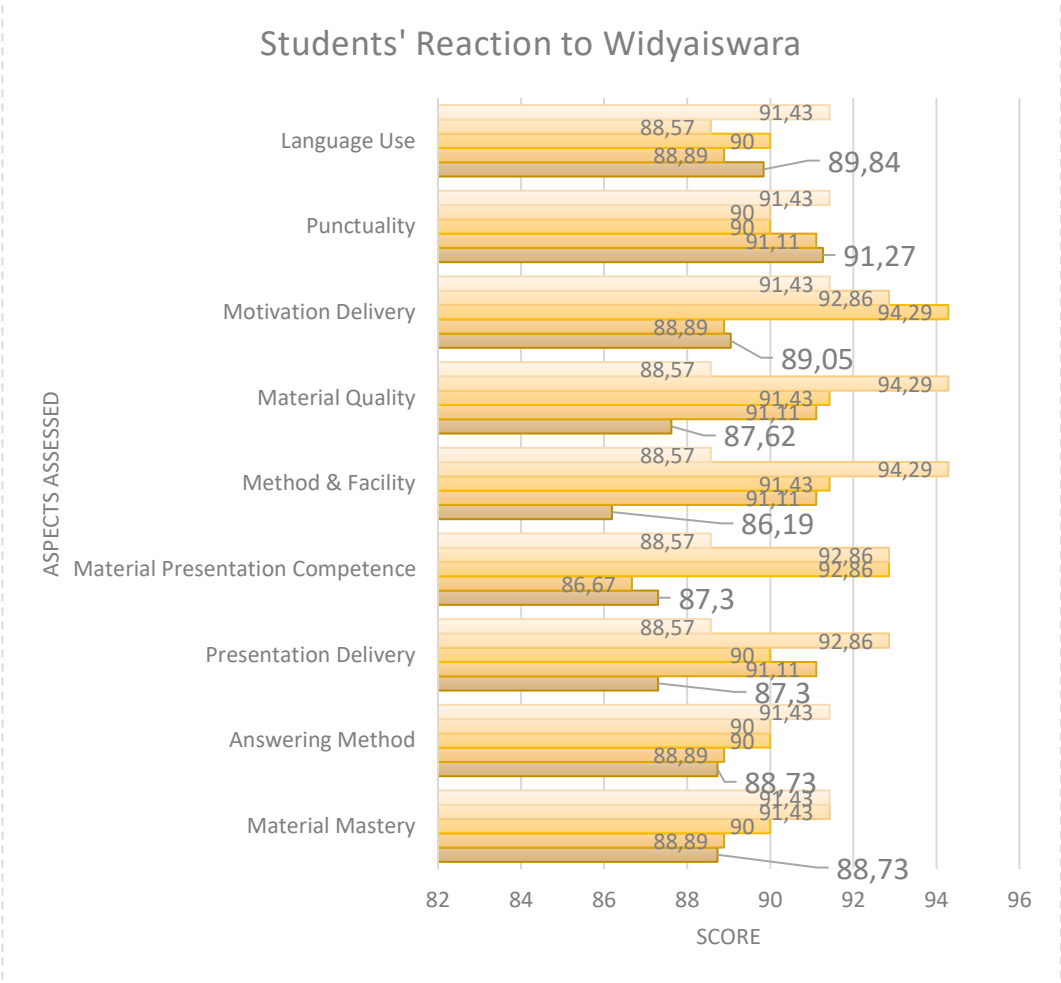
Very Good Likert Score : 3.5-4; Good: 3.0-3.4; Pretty Good: 2.5-3.0; Less : <2.5

Figure 2. Reaction of the Community Satisfaction Index for Electricity Inspection Training for Young Levels February 26, 2024

Source: Primary data analysis (2024)

c. Participants' Reactions to Widyaiswara

From the data graph below, it can be seen that the score regarding the reaction of the technical training participants for the inspection of electricity generation at the young level to the implementation of widyaiswara which was carried out as many as 14 training participants had the highest score range of 94.29 which came from the aspects of providing motivation, quality of materials, and methods and facilities. While the lowest aspect is the ability to present material with a score of 86.67. So it is known that the reaction of participants to the technical training of electricity generation inspection for young people entered the qualification of "Very Good" (90-100) with an average overall score of 90.25.



Excellent Score: 90-100; Good: 80-90; Fairly Good : 70-80 Less : <70

Figure 3. Reaction to Widyaiswara Electrical Power Inspection Training at the Junior Level 26 February 2024

Source: Primary data analysis (2024)

Technical training on electricity generation inspections for young people generally received positive responses from participants in the Good to Very Good category. In terms of implementation, the average score reached 89.21 with the main strength in the material aspect, the suitability of the pre-test and post-test, as well as the service of the participants, while the weaknesses were still seen in the aspect of schedule and duration. The Community Satisfaction Index (IKM) showed very good results with an average score of 3.60, especially in the aspects of implementer behavior, competence, and product specifications. The reaction to widyaiswara was also very good with an average score of 90.25, supported by motivation, quality of materials, as well as methods and facilities, although the ability to present material is still a record. Thus, this training has been effective, but improvements are still needed in scheduling arrangements and increasing the variety of material presentations so that the quality is more optimal.

Kirkpatrick's Evaluation of the Learning Stage for the Implementation of Technical Training for Electrical Power Generation Inspection at the Youth Level February 26, 2024

In the second level test, Kirkpatrick's method is to look at learning from participants after participating in training. With the hypothesis decision H0 is that there is no difference in the average learning outcome between the Pre-Test and Post-Test participants of the Technical Training for Electricity Generation Inspection at the Junior Level. While Ha is that there is a difference in the average learning outcomes between the Pre-Test and Post-Test participants of the Junior Level Power Generation Inspection Technical Training.

Table 1. Paired Samples Test for Inspection of Electricity Generation at the Junior Level 26 February 2024

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Hours of deviation	Std. Error Mean	Lower	Upper	t	Df	Sig. (2-tailed)
Pair 1	Pre-Test - Post-Test	-19.667	16.633	4.295	-28.878	-10.455	-4.579	14	.000

Source: Primary data analysis (2024)

To find *the value of the t table*, where *the t table is* searched based on the value of df (degree of freedo or degree of freedom) and significance value (α/2). From the table below, it is known that the df value is 14 and the value of 0.05/2 is equal to 0.025. This value is used as a reference in finding *the value of the t table* in the distribution of the value of the statistical table. Thus, since *the t value of the table is* 4.575 > *t of the table* 2.01537, it can be concluded that H0 is rejected and Ha is accepted. So it can be concluded that there is an average change between the learning outcomes of the Pre-Test and the Post-Test of Technical Training for Electricity Generation Inspection at the Junior Level.

CONCLUSION

The post-training evaluation of electricity inspectors at *PPSDM KEBTKE* using Kirkpatrick Levels 1 (Reaction) and 2 (Learning) confirms the effectiveness of the technical training on electricity generation inspections at the junior level. At Level 1, participants provided positive responses (Good to Very Good), with an average implementation score of 89.21—strong in material quality, pre/post-test suitability, and participant service—but weaker in scheduling and duration; the Community Satisfaction Index (*IKM*) averaged 3.60 (Very Good), particularly for implementer behavior, competence, and product specifications, while *widyaiswara* quality scored 90.25 (Very Good), bolstered by motivation, materials, methods, and facilities, though presentation skills need enhancement. At Level 2, t-test results rejected H_0(t-calculated = 4.575 > t-table = 2.01537), demonstrating significant pre-test to post-test improvements in competencies. Overall, the training boosted satisfaction and skills effectively, yet requires better scheduling and material presentation variations for optimization. Future studies could extend to Kirkpatrick Levels 3 (Behavior) and 4 (Results) to assess long-term on-

the-job application and organizational impact, or compare this program's outcomes with similar trainings at other Indonesian energy institutions.

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