

Analysis of OJT Implementation Standardization on Radar ATC Trainee Competence at AirNav Indonesia Palembang

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Abstract

This study aims to analyze the effect of the standardization of On-the-Job Training (OJT) implementation for Air Traffic Controllers on the competency of Radar OJT participants at Perum LPPNPI Palembang Branch. A quantitative research approach was employed to examine the relationship between OJT standardization as the independent variable and participant competency as the dependent variable. The research sample consisted of 57 respondents selected using a total sampling technique to ensure comprehensive representation. Data were collected through structured questionnaires that had been tested for validity and reliability, and subsequently analyzed using SPSS version 26. The results of the validity test confirmed that all questionnaire items were valid, while reliability testing showed high Cronbach's Alpha values for both the OJT standardization and competency variables, indicating strong internal consistency. Correlation analysis revealed a very strong relationship between OJT implementation standardization and Radar OJT participant competency. Furthermore, simple linear regression analysis demonstrated that OJT standardization contributed substantially to the improvement of participant competency. The findings indicate that a well-structured and consistently applied OJT program significantly enhances technical skills, operational readiness, and professional behavior of Radar OJT participants. This study concludes that effective standardization of OJT implementation plays a crucial role in developing competent Air Traffic Controllers and supports the improvement of air traffic service quality and aviation safety.

Keywords: OJT Standardization, Competency, Radar Ojt, Air Traffic Controller, Air Traffic Services

INTRODUCTION

Air transportation is a mode of transport characterized by high operational complexity, requiring precision, accuracy, and timeliness in air traffic control services. In this context, the performance of Air Traffic Controllers (ATC) plays a decisive role in ensuring aviation safety and operational efficiency. To produce competent and reliable ATCs, a structured and standardized training process is essential. One of the most critical stages in ATC training is On-the-Job Training (OJT), which is conducted directly in the operational environment. Through OJT, trainees apply theoretical knowledge acquired during classroom and simulation training to real operational conditions. OJT also serves as a crucial assessment phase to determine whether a trainee is eligible to progress toward operational licensing.

Perum LPPNPI (AirNav Indonesia) is the institution responsible for providing civil air navigation services in Indonesia. The Palembang Branch manages a strategic airspace region with increasing traffic density, which places higher demands on ATC performance and competence. As air traffic volume continues to grow, the effectiveness of ATC training particularly OJT becomes increasingly important. However, operational observations indicate that the implementation of OJT has not always been fully standardized. Challenges include variations in training duration, limited availability of certified On-the-Job Training Instructors (OJTI), inconsistencies in competency-based evaluation, and insufficient documentation of trainee progress.

Internationally, ICAO emphasizes that OJT must be implemented based on competency-based training principles, supported by a clear Unit Training Plan, adequate training duration, certified instructors, and objective assessment systems. In Indonesia, OJT implementation is also governed by regulations issued by the Directorate General of Civil Aviation and internal Standard

Operating Procedures of AirNav Indonesia (Perum LPPNPI, 2023). Failure to implement OJT in accordance with these standards may lead to uneven competency outcomes among trainees and potentially increase operational safety risks.

Several internal evaluations at AirNav Indonesia Palembang Branch reveal inconsistencies in OJT practices, such as unequal training duration among trainees performing similar tasks, incomplete instructor certification, and irregular performance evaluations. These conditions suggest a gap between established OJT standards and actual implementation. Given that radar air traffic services require high levels of accuracy, situational awareness, and rapid decision-making, insufficient standardization of OJT may directly affect trainee competence and overall service quality. Therefore, a systematic analysis of OJT implementation standardization and its impact on trainee competency is essential to support aviation safety and organizational performance.

Based on the background described above, the research problem of this study can be formulated as follows: How does the standardization of On-the-Job Training (OJT) implementation for Air Traffic Controllers influence the competency of Radar OJT participants at Perum LPPNPI Palembang Branch?

In line with the research problem, the objectives of this study are:

1. To analyze the implementation of OJT standardization for Air Traffic Controllers at Perum LPPNPI Palembang Branch.
2. To examine the influence of OJT implementation standardization on the competency of Radar OJT participants at Perum LPPNPI Palembang Branch.

RESEARCH METHODS

This study employed a quantitative research design based on a positivist approach, aiming to examine the influence of the standardization of On-the-Job Training (OJT) implementation on the competency of Radar OJT participants. Quantitative methods were selected because the variables under investigation could be measured numerically and analyzed statistically to test the proposed hypothesis. According to Sugiyono (2021), quantitative research is appropriate for testing theories by examining relationships between measurable variables using statistical analysis.

Research Location and Time

The research was conducted at Perum LPPNPI (AirNav Indonesia) Palembang Branch, which provides air traffic services for a strategic airspace area in South Sumatra. Data collection was carried out over a three-month period, from June to August 2025, in accordance with operational accessibility and respondent availability.

Population and Sampling Technique

The population of this study consisted of all Radar OJT participants at Perum LPPNPI Palembang Branch. Given the relatively limited population size, this study applied a total sampling (census) technique, whereby all members of the population were selected as research respondents. A total of 57 respondents participated in the study. This technique was chosen to ensure comprehensive representation and to reduce sampling bias (Sugiyono, 2021).

Research Variables and Operational Definitions

The study involved two main variables. The independent variable (X) was the standardization of OJT implementation, defined as the consistency of OJT execution in accordance with established standards, including training curriculum, instructional methods, evaluation procedures, documentation, and instructor qualifications, as regulated by ICAO Doc 9868 and AirNav Indonesia SOP OJT (Perum LPPNPI, 2023). The dependent variable (Y) was Radar OJT participant competency, defined as the integration of knowledge, technical skills,

attitudes, and operational readiness required to perform radar air traffic control duties safely and independently.

Data Collection Techniques and Instruments

Data were collected using a structured questionnaire as the primary instrument. The questionnaire was designed based on competency-based training indicators and OJT standardization criteria derived from ICAO guidelines and relevant literature. A Likert scale was used to measure respondents' perceptions of both variables. Prior to data analysis, the instrument was subjected to validity and reliability testing to ensure measurement accuracy and consistency (Sugiyono, 2021).

Data Analysis Techniques and Statistical Model

Data analysis was conducted using SPSS version 26. Descriptive statistical analysis was applied to describe respondent characteristics and variable tendencies. Instrument validity was assessed using item correlation analysis, while reliability was evaluated using Cronbach's Alpha coefficients. To examine the relationship between variables, correlation analysis was employed, followed by simple linear regression analysis to determine the contribution of OJT standardization to participant competency. Hypothesis testing was performed using the t-test at a significance level of 0.05. These statistical techniques are well-established in quantitative research and were applied without excessive formula exposition, in line with academic publication standards.

RESULTS AND DISCUSSION

This study analyzes the effect of the standardization of On-the-Job Training (OJT) implementation on the competency of Radar OJT participants at Perum LPPNPI Palembang Branch. Data were collected from 57 respondents who had participated in Radar OJT and were directly involved in operational air traffic control activities. The integrated presentation of results and discussion aims to provide a coherent interpretation of empirical findings within the context of air traffic controller training and competency development.

Respondent Characteristics

The respondent profile shows that Radar OJT participants at Perum LPPNPI Palembang Branch vary in terms of gender, age, and educational background. This diversity reflects the actual condition of human resources involved in air traffic services and provides a relevant basis for analyzing training standardization and competency outcomes.

Table 1. Respondent Demographic Profile

Characteristic	Category	Frequency
Gender	Male	Majority
	Female	Minority
Education	Diploma	Dominant
	Bachelor	Remaining

The variation in educational background highlights the importance of a standardized OJT framework to ensure that all participants achieve comparable competency levels regardless of prior academic differences.

Standardization of OJT Implementation

The standardization of OJT implementation was measured through indicators including curriculum structure, relevance of training materials, consistency of instructor guidance, evaluation procedures, and documentation of trainee progress. The descriptive analysis indicates that the OJT standardization variable falls within the high category, as summarized in Table 2.

Table 2. OJT Standardization Score Summary

Variable	Mean Score	Category
OJT implementation standardization	High	High

This result indicates that the Radar OJT program at Perum LPPNPI Palembang Branch has generally been implemented in accordance with established standards, including those outlined in ICAO Doc 9868 and internal AirNav Indonesia SOPs (ICAO, 2018). Consistent curriculum delivery, structured mentoring by certified OJT Instructors (OJTI), and documented evaluation processes support effective competency-based training.

Competency of Radar OJT Participants

Participant competency was assessed based on knowledge, technical skills, work attitude, and operational readiness. The descriptive analysis shows that Radar OJT participant competency is also categorized as high, as presented in Table 3.

Table 3. Radar OJT Participant Competency Summary

Variable	Mean Score	Category
Radar OJT participant competency	High	High

This finding suggests that most participants have developed adequate mastery of radar procedures, operational decision-making, communication skills, and professional discipline. These competencies are essential for handling complex radar-based air traffic control tasks and align with the competency framework described by ICAO competency-based training principles.

Relationship Between OJT Standardization and Participant Competency

The analysis of the relationship between OJT standardization and participant competency indicates a very strong association. As summarized in Table 4, higher levels of OJT standardization correspond with higher levels of participant competency.

Table 4. Relationship Between OJT Standardization and Competency

Analysis Aspect	Interpretation
Correlation	Very strong positive relationship
Regression	Substantial contribution to competency

These results indicate that standardized OJT implementation plays a crucial role in shaping participant competency. Structured mentoring, consistent evaluation, and systematic documentation enhance the transfer of training from learning environments to real operational settings. This finding supports the arguments of Noe (2020) and Mangkunegara (2021), who emphasize that standardized and competency-based training improves learning outcomes and job readiness.

From an operational perspective, participants who undergo well-standardized OJT demonstrate greater confidence in operating radar systems, applying standard operating procedures, and managing dynamic traffic situations. This is particularly important in high-risk aviation environments, where inconsistencies in training may lead to uneven competency and increased operational risk.

Overall, the integrated results and discussion confirm that standardization of OJT implementation significantly supports the development of competent Radar ATC personnel. Although participant competency is already at a high level, continuous refinement of OJT standards, instructor certification, and evaluation mechanisms remains essential to ensure consistency and safety in air traffic services.

CONCLUSION

Based on the results and discussion, this study concludes that the standardization of On-the-Job Training (OJT) implementation has a strong and positive role in improving the competency of Radar OJT participants at Perum LPPNPI Palembang Branch. The findings show that both OJT standardization and participant competency are categorized at a high level, indicating that structured training procedures, consistent mentoring by certified instructors, and systematic evaluation processes effectively support competency development. Well-standardized OJT implementation enables trainees to acquire technical skills, operational understanding, and professional attitudes required for radar air traffic control duties. The close relationship between OJT standardization and participant competency highlights the importance of applying competency-based training principles consistently to ensure uniform learning outcomes among trainees with diverse educational backgrounds. Therefore, maintaining and continuously improving OJT standardization is essential to support the development of competent Air Traffic Controllers and to enhance the quality and safety of air traffic services.

REFERENCES

- International Civil Aviation Organization. (2018). Safety management manual (SMM) (4th ed.). ICAO.
- Mangkunegara, A. A. A. P. (2021). *Manajemen sumber daya manusia perusahaan*. Remaja Rosdakarya.
- Noe, R. A. (2021). *Employee training and development* (8th ed.). McGraw-Hill.
- Perum LPPNPI. (2023). *Standar prosedur operasional OJT pemanduan*. Dokumen internal.
- Sugiyono. (2021). *Metode penelitian kualitatif, kuantitatif, dan R&D*. Alfabeta.