



Integrated Forensic Training Program for Indonesian National Police Investigators in West Java Region

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ABSTRACT

The increasing complexity of criminal cases in West Java necessitates a critical upgrade in the competency of Indonesian National Police (Polri) investigators regarding the application of Scientific Crime Investigation (SCI) principles. A significant gap has been identified in the integrated forensic evidence handling skills (digital, biological, and chemical) at the Sub-Regional Police Resort (Polres) level, potentially compromising the accountability of criminal proceedings. This training program aimed to enhance the capacity of 40 investigators from the Jabar region through a comprehensive, integrated forensic training course. The 5-day program (September 15-19, 2025) was conducted in collaboration with the National Police's Forensic Laboratory Center (Puslabfor Bareskrim Polri), utilizing a Pretest-Posttest design and a hands-on simulation methodology. Evaluation results demonstrated an average competency score increase of 48.57% (from 55.8 to 82.9), significantly exceeding the minimum target of 25%. The most drastic improvement was observed in the Digital Forensics module (79.57%). Practically, 92.5% of participants showed enhanced technical proficiency in applying the integrated Chain of Custody (CoC) protocol. The participant satisfaction level reached 94% (4.7 out of 5.0). This training proved highly effective in bridging the competency gap, strengthening science-based investigative administration, and supporting the establishment of an accountable criminal justice system. The adoption of technical guidelines and the implementation of a sustained program are recommended for follow-up.

Keywords: competency gap, criminal investigation, forensics, police investigator, Puslabfor

INTRODUCTION

The enhancement of law enforcement quality stands as a core pillar in realizing effective good governance, particularly within the security sector. The Indonesian National Police (Polri), as the foremost institution in the criminal investigation process, plays a strategic role in guaranteeing legal certainty and upholding justice (Kurniawatie, 2025). In the context of investigative administration, the accountability and validity of investigation outcomes are fundamentally dependent on the application of modern, scientifically grounded forensic principles, collectively known as Scientific Crime Investigation (Sativa, 2021).

The evolution of forensic science is a crucial element in modern criminal justice systems (Bouzin et al., 2023). Given this evolution, the use of technology in investigations must be optimally maximized (Zhang & Webb, 2025). Objective, lab-testable scientific

evidence plays a significant role in ensuring the legality of investigation results. The increasing reliance on scientific evidence by investigators, criminal laboratory analysts, and other stakeholders necessitates effective communication and cooperation among all involved parties (Horvath & Meesig, 1996). The integration between field investigators and forensic experts is key to maintaining the quality of the scientific proof process at the crime scene.

However, a significant competency gap persists among Polri investigators, particularly at the regional level, regarding the understanding and application of basic forensic principles during crime scene processing (Olah Tempat Kejadian Perkara - TKP). This limitation frequently impedes the effectiveness of investigations, especially during the initial evidence collection phase. Consequently, comprehensive forensic training for investigators must be a primary focus, considering their pivotal role in the collection, management, and utilization of scientific evidence in criminal case investigation.

A thorough understanding of the types and characteristics of forensic evidence is a crucial preliminary step in the investigative process (Lyman, 2021). If potential evidence is not properly identified, collected, preserved, or tested, its probative value can be significantly diminished or entirely lost (Lee & Pagliaro, 2013). This condition underscores that field investigators hold the primary responsibility for maintaining the integrity of evidence from the initial stage through to laboratory analysis.

The West Java region is characterized by a high volume and complexity of criminality, ranging from conventional offenses and narcotics cases to cybercrimes that surge with societal digitalization. Data from the West Java Regional Police (2024) recorded 28,616 criminal cases, with approximately 41% of these requiring forensic analysis as part of the evidence process (Pusiknas Bareskrim Polri, 2025). This complexity demands that investigators not only master formal legal procedures but also possess the technical competence to handle various types of evidence—physical, biological (DNA), and digital evidence.

Despite the demand, only about 36% of investigators possess formal experience or training related to laboratory forensic analysis. This gap results in numerous instances of poorly managed evidence, from collection and storage to the documentation of examination results. While modern policing is equipped with forensic resources, challenges persist, including investigative errors often caused by the neglect or misuse of forensic science principles (Zhang & Webb, 2025).

Furthermore, a persistent competency gap is prevalent among operational investigators at the Sub-Regional Police Resort (Polres) and Sector Police (Polsek) levels. Existing training tends to be fragmented, focusing on a single aspect such as crime scene management or digital forensics, and often fails to integrate the entire forensic continuum from crime scene security to the seizure of digital and biological evidence. If evidence is not properly secured at the initial stage by the first responder, the integrity of the Chain of Custody (CoC) can be broken, potentially weakening or even invalidating the judicial process.

Based on this urgency, the "Integrated Forensic Training Program for Indonesian National Police Investigators in West Java Region" was conducted. The program aimed to enhance the investigators' capacity in biological, chemical, and digital forensics, enabling them to apply forensic procedures holistically, standardly, and scientifically. Through this competency enhancement, the ultimate goal is to foster professional and accountable investigative processes, thereby supporting a transparent and equitable criminal justice system in West Java.

METHOD

Time and Location

The 5-day training took place from September 15-19, 2025, at the National Police's Forensic Laboratory Center (Puslabfor Bareskrim) facility in Cipambuan, Babakan Madang, Bogor Regency, West Java. The Puslabfor Bareskrim was chosen as a strategic partner due to its expert resources, instrumentation, and national standard laboratory facilities, which are essential for conducting high-quality forensic training.

Target and Participants

The participants consisted of 40 investigators assigned by the Sub-Directorate of Operational Guidance of the West Java Regional Police (Polda Jabar), drawn from various Polres in the region (Bandung, Cimahi, Cirebon, Garut, and Tasikmalaya). Participants included both officers (Perwira) and non-commissioned officers (Bintara) actively serving in the Criminal Investigation Unit (Satuan Reserse Kriminal - Reskrim) and Narcotics Investigation Unit (Satuan Reserse Narkoba - Resnarkoba), who frequently act as first responders and lead investigators in the field.

Program Stages

The program was executed in three main phases:

1. Preparation Phase

- Development of training modules covering: Fundamentals of General Forensics, DNA and Biological Sample Analysis, Chemical and Narcotics Identification, and Digital Forensics.
- Technical coordination with Polda Jabar and Puslabfor to determine the schedule and instructors.
- Creation of Pre-test and Post-test instruments to measure competency gain.

2. Implementation Phase

The 5-day training activities were structured as follows in Table 1.

Table 1. Schedule and content outline of the integrated forensic training program

Day	Main Activity	Activity Format
1	Opening, Pre-test, and Forensic Fundamentals	Interactive lecture & case discussion
2	Biological Forensics	Hands-on practice: bloodstain identification, fingerprinting, and simple DNA isolation
3	Chemical Forensics & Toxicology	Presumptive testing of blood and narcotics, and hazardous chemical identification
4	Digital Forensics	File metadata analysis, digital trace tracking, and data security
5	Crime Scene Simulation & Evaluation	Case reconstruction, Post-test, and participant feedback

3. Evaluation Phase

Evaluation was conducted using:

- Pre-test and Post-test to quantify the improvement in theoretical knowledge.
- Practical Observation to assess participants' skills during the crime scene simulation.
- Satisfaction Questionnaire regarding the training content, instructors, and facilities.

Success Indicators

- Post-test score improvement of a minimum of 25% from the baseline score.
- 85% of participants demonstrate improved technical proficiency in practical application.
- Participant satisfaction level $\geq 90\%$.

RESULTS AND DISCUSSION

Participants Profile and Program Implementation

The activity was attended by 40 investigators from five Polres assigned by Polda Jabar. Of the total participants, 75% were from the Criminal Investigation Unit (Reskrim) and 25% from the Narcotics Investigation Unit (Resnarkoba), with ranks predominantly ranging from Bripta to Iptu. The training proceeded on schedule over 5 days (October 15-19, 2025) at the Puslabfor Bareskrim facility in Bogor. The availability of laboratory equipment and Puslabfor experts enabled investigators to directly interact with instruments and real-life case studies, reinforcing the utilized hands-on practice methodology.

Knowledge Evaluation Results (Pre-Test and Post-Test)

The knowledge gain was measured by comparing the mean scores of the pre-test and post-test, with a maximum score of 100. The evaluation instrument tested conceptual and procedural understanding across the four main modules. The pre-test and post-test activities are presented in Figure 1, and the comparative results are summarized in Table 2.



Figure 1. Pre-test and post-test activities

Table 2. Comparison of pre-test and post-test results of training participants

Competency Module	Mean Pre-Test Score	Mean Post-Test Score	Score Improvement	Percentage Improvement
Forensic Fundamentals & Crime Scene	65.1	87.2	22.1	33.95%
DNA Analysis & Biological	53.0	79.5	26.5	50.00%

Samples				
Chemical & Narcotics Identification	58.7	81.3	22.6	38.50%
Digital Forensics (Basic)	46.5	83.5	37.0	79.57%
Overall Average	55.8	82.9	27.1	48.57%

The results indicate an average competency score increase of 48.57%. This improvement significantly surpasses the established success indicator (minimum 25%). The most substantial gain was observed in the Digital Forensics (Basic) module, with an increase of 79.57%. This data confirms the finding in the Introduction that Digital Forensics is an area where field investigators have the largest knowledge gap, demonstrating the high impact of this training intervention. The high improvement rate (50.00%) in the DNA Analysis & Biological Samples module also emphasizes the perceived lack of prior training in this area among investigators. The digital forensic training activities and the DNA and biological sample analyses are presented in Figures 2 and 3.



Figure 2. Digital forensics training



Figure 3. DNA and biological sample analyses training

Digital forensics is a critical instrument supporting investigative duties, particularly in the collection, examination, and analysis of electronic evidence related to criminal acts. This competency is a prerequisite for electronic documents to be admissible as legal evidence from the investigation and prosecution phases through to trial (Nasrullah et al.,

2024). Inadequate understanding of procedures for the acquisition, analysis, interpretation, and preservation of digital evidence risks data integrity loss, metadata corruption, or nullification of probative value due to a breach of the Chain of Custody principle (Zakariya, 2019). In this context, the investigator's ability to apply digital forensic techniques is central to tracing digital footprints, identifying perpetrator activities, mapping relationships between evidence, and scientifically linking electronic information with physical evidence (Iswani, 2024).

As the complexity of cybercrime increases and conventional crime modes evolve through information technology, the need for investigators competent in digital forensics becomes more urgent (Baroto, 2024). Mastery of digital device examination techniques not only accelerates the investigation process but also enhances the accuracy of proof and strengthens the position of law enforcement in judicial proceedings. Thus, capacity building in digital forensics, whether through formal education, technical training, or professional certification, is a strategic step to meet the challenges of law enforcement in the digital era (Iswani, 2024).

Practical Evaluation Results

Practical evaluation was conducted on the final day through a complex crime scene simulation, requiring participants to apply integrated procedures from all four modules. The results of the practical observation are presented in Table 3.

Table 3. Results of integrated forensic training practical evaluation

No.	Evaluated Aspect	Assessment Indicator	Result Achieved	Program Target	Remarks
1	Technical Skill Improvement	Participants showing competency improvement in the integrated crime scene simulation	37 out of 40 participants (92.5%)	≥85% participants show improvement	Target achieved; improvement primarily seen in applying the Chain of Custody and evidence packaging.
2	Collaboration Success	Coordination and technical feedback between investigators and Puslabfor	Effective collaboration based on field observation	Effective collaboration with a minimum of one forensic laboratory unit	Puslabfor experts provided real-time feedback, reducing the risk of biological and digital evidence contamination.
3	Participant Satisfaction Level	Mean score of the training satisfaction questionnaire (1–5 scale)	4.7/5.0 (94%)	≥4.5/5.0 (90%)	Target exceeded; the hands-on method was highly relevant to real investigative needs.

Based on the practical evaluation results in Table 2, the training demonstrated high effectiveness in enhancing investigators' proficiency across various forensic skill aspects. In terms of technical skill improvement, 37 out of 40 participants (92.5%) showed significant enhancement in applying integrated crime scene procedures. This figure exceeded the program target of $\geq 85\%$, with the most notable improvement observed in

the accurate implementation of the Chain of Custody and evidence packaging techniques, which had frequently been erroneous in pre-simulation stages.

Furthermore, the collaboration success aspect also yielded positive results. Field observation revealed effective coordination between the investigators and experts from Puslabfor Bareskrim. The laboratory experts provided real-time feedback when participants were packaging and securing biological and digital samples, thereby minimizing the potential for contamination—a crucial issue in scientific proof (Lee & Pagliaro, 2013). This confirms that the training not only improved individual abilities but also strengthened cross-unit collaborative working patterns.

For the participant satisfaction level, the questionnaire results showed a mean score of 4.7 out of 5.0 (94%), exceeding the minimum target of 4.5 (90%). This high satisfaction level was driven by the hands-on learning methodology and the use of case examples relevant to actual investigative conditions in the West Java region. Participants rated the direct practical approach as highly beneficial in transferring theoretical knowledge into immediately applicable technical skills.

Overall, the evaluation results confirm that this training program successfully met and exceeded the set performance targets in enhancing technical competence, strengthening professional collaboration, and achieving high participant satisfaction.

CONCLUSION

The Integrated Forensic Training Program for Indonesian National Police Investigators in the West Java Region, executed in collaboration with Puslabfor Bareskrim Polri, was successful and yielded measurable positive impacts on human resource capacity building in the security sector. The training successfully increased the investigators' average competency by 48.57%, with the highest gain in the Digital Forensic evidence handling aspect (79.57%). The success of this training affirms that an integrated approach and partnership with expert institutions (Puslabfor) are vital strategies for addressing competency gaps in the field. Substantively, this enhancement in technical competence directly strengthens investigative administration and supports the realization of an accountable Scientific Crime Investigation within the West Java Polres jurisdiction.

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