THE IMPACT OF USING VIRTUAL REALITY (VR) TECHNOLOGY TRAINING ON THE PERFORMANCE OF THE BRIMOB UNIT AT POLDA ACEH WITH PERSONNEL PERFORMANCE AS A MEDIATOR

Akmal[1]*, Jasman J [2], Muhammad Adam [3], Mukhlis[4], Farah Rizky Nadya[5]

[1]Postgraduate Student of Management and Bussiness Department, Universitas Syiah Kuala
[2,3,4] Management and Bussiness Department, Universitas Syiah Kuala
[5] Univeristas Syiah Kuala

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***Correspondence Address:**
akmalfarel69@gmail.com

Abstract: This study examines the impact of Virtual Reality (VR) technology training on the performance of the Brimob unit at Polda Aceh, with a focus on the mediating role of personnel performance. The research employs a quantitative approach, utilizing surveys and performance evaluations to assess the effectiveness of VR training in enhancing unit performance. The findings suggest that VR training significantly improves the operational capabilities of the Brimob unit by enhancing the skills and effectiveness of individual personnel. Furthermore, the study confirms that personnel performance acts as a crucial mediator in the relationship between VR training and overall unit performance, highlighting the importance of targeted training programs in improving organizational outcomes.

INTRODUCTION

The integration of Virtual Reality (VR) technology into training programs for law enforcement and military units has gained significant attention over recent years. As organizations strive to enhance the operational effectiveness of their personnel, VR has emerged as a powerful tool capable of providing immersive and realistic training experiences. In particular, the use of VR in the training of specialized units, such as the Brimob (Mobile Brigade Corps) unit at Polda Aceh, offers the potential to significantly improve performance by simulating high-stress and complex scenarios that are otherwise difficult to replicate in real-world training environments (Zechner et al., 2023).

VR technology allows trainees to engage in scenarios that are highly immersive, providing a level of presence and realism that traditional training methods cannot match. The use of VR in police and military training has been shown to enhance decision-making, situational awareness, and stress management, all of which are critical in high-

pressure situations (Giessing, 2021). Moreover, VR training can be tailored to specific operational requirements, allowing for the customization of scenarios to meet the unique needs of the Brimob unit. This adaptability makes VR an invaluable tool in preparing personnel for a wide range of potential threats and challenges.

The effectiveness of VR training is further enhanced by its ability to mediate the relationship between training and performance through personnel engagement and psychological readiness. Studies have shown that when trainees perceive their training as realistic and relevant, their performance in actual operations improves significantly (Lackey et al., 2016). This is particularly important for specialized units like Brimob, where the stakes are high, and the margin for error is minimal. By creating a virtual environment that closely mirrors real-world conditions, VR training can enhance the cognitive and physical preparedness of personnel, leading to improved operational outcomes.

The mediating role of personnel performance in the effectiveness of VR training is also crucial. Research indicates that the benefits of VR training are most pronounced when personnel are fully engaged and motivated by the training process (Yoon et al., 2023). This engagement is often driven by the perceived utility of the training, which in turn influences how well the skills acquired in VR translate to real-world performance. In the context of the Brimob unit, where the ability to respond quickly and effectively to dynamic situations is critical, the role of personnel performance as a mediator cannot be overstated.

Additionally, VR training provides a safe and controlled environment where personnel can make mistakes and learn from them without the real-world consequences. This aspect of VR is particularly beneficial in training scenarios that involve high-risk operations, such as bomb disposal, hostage rescue, and counter-terrorism activities (Pantazidis et al., 2023). By allowing trainees to experience and navigate these scenarios in a virtual space, they can build confidence and competence that directly translate to improved performance in the field.

The potential for VR to reduce training costs and time while increasing the effectiveness of training programs is another significant advantage. Traditional training methods often require extensive resources, including physical space, equipment, and personnel, all of which can be expensive and logistically challenging to manage. VR

training, on the other hand, can be conducted in a virtual environment, significantly reducing the need for physical resources and allowing for more frequent and intensive training sessions (Saunders et al., 2019).

Moreover, the adaptability of VR technology enables the creation of training modules that can be easily updated and customized to reflect new threats, tactics, or operational requirements. This flexibility is particularly valuable for the Brimob unit, which must be prepared to respond to a wide range of scenarios, from natural disasters to terrorist attacks (Armas et al., 2019). As the nature of these threats evolves, so too can the training programs, ensuring that personnel are always equipped with the most relevant skills and knowledge.

The effectiveness of VR training is not limited to individual performance; it also has the potential to enhance team coordination and communication. In high-stress situations, the ability to work effectively as a team is crucial, and VR training can simulate these environments, allowing personnel to practice and refine their teamwork skills (Murtinger et al., 2022). This is particularly important for the Brimob unit, where coordinated efforts are often required to achieve mission success.

Furthermore, the use of VR in training can contribute to the psychological resilience of personnel. By exposing trainees to high-stress scenarios in a controlled environment, VR can help build mental toughness and reduce the psychological impact of real-world operations. This aspect of VR training is particularly valuable in preparing personnel for the emotional and psychological demands of their roles (McAllister et al., 2022).

In conclusion, the integration of VR technology into the training programs of the Brimob unit at Polda Aceh has the potential to significantly enhance both individual and unit performance. By providing a realistic, immersive, and flexible training environment, VR can improve the cognitive and physical readiness of personnel, reduce training costs, and enhance team coordination. Moreover, the mediating role of personnel performance in the effectiveness of VR training underscores the importance of engagement and psychological readiness in achieving optimal training outcomes. As VR technology continues to evolve, its application in law enforcement and military training is likely to expand, offering even greater opportunities for enhancing operational effectiveness (Webster, 2016).

This study introduces a novel exploration of the integration of Virtual Reality (VR)

technology into the training programs of the Brimob unit at Polda Aceh, focusing on its unique potential to enhance both individual and team performance in high-stress, complex scenarios. While previous research has highlighted the general benefits of VR in law enforcement and military training, this study distinguishes itself by specifically examining the mediating role of personnel performance and engagement in the effectiveness of VR training within a specialized unit operating in a region with distinct socio-political and operational challenges.

The study's novelty lies in its investigation of how VR technology can be tailored to meet the specific needs of Brimob personnel, offering a highly immersive and realistic training environment that traditional methods cannot replicate. By simulating scenarios such as counter-terrorism, hostage rescue, and disaster response, this research will explore how VR can enhance decision-making, situational awareness, and stress management, which are critical in high-pressure situations. Moreover, the study will analyze how the perceived realism and relevance of VR training influence personnel's cognitive and physical preparedness, ultimately leading to improved operational outcomes.

Another key aspect of this study's novelty is its focus on the adaptability of VR training modules, which can be continually updated to reflect evolving threats and operational requirements. This flexibility is particularly significant for the Brimob unit, which must be prepared for a wide array of scenarios. The study will also examine the cost-effectiveness of VR training, proposing that it can reduce the logistical and financial burdens associated with traditional training methods while allowing for more frequent and intensive training sessions.

Furthermore, this research will be the first to investigate the potential of VR training to enhance team coordination and communication within Brimob, an aspect crucial for the success of their missions. By simulating high-stress environments that require coordinated efforts, the study will assess how VR can improve teamwork and collective decision-making. Additionally, the study will explore the role of VR in building psychological resilience among Brimob personnel, preparing them for the emotional and mental demands of real-world operations.

RESEARCH METHODS

This section outlines the methodology used to examine the impact of Virtual Reality (VR) technology training on the performance of the Brimob unit at Polda Aceh, with personnel performance serving as a mediator. The research employed a mixed-methods approach, integrating quantitative and qualitative data collection techniques to provide a comprehensive understanding of the effectiveness of VR training.

1. Research Design

The study utilized a cross-sectional design, allowing for the assessment of relationships between VR training, personnel performance, and overall unit performance at a specific point in time. This design was chosen to capture the immediate effects of VR training and to explore the mediating role of personnel performance in these effects.

2. Population and Sample

The target population consisted of Brimob personnel at Polda Aceh who had undergone VR training as part of their operational preparedness programs. A purposive sampling method was employed to select participants who had completed the VR training module within the past six months. The sample size included 100 Brimob personnel, ensuring a representative distribution across different ranks and experience levels.

3. Data Collection

Quantitative Data:

Quantitative data were collected using a structured questionnaire that included the following sections:

- VR Training Experience: Questions assessed the participants' perceptions of the VR training's realism, immersion, and relevance to their operational duties
- Personnel Performance: A self-assessment scale was used to measure perceived improvements in cognitive and physical skills, decision-making abilities, and stress management as a result of the VR training
- Unit Performance: Supervisory evaluations provided data on overall unit performance, focusing on team coordination, response times, and effectiveness in simulated and real-world scenarios.

Qualitative Data:

In-depth interviews were conducted with a subset of 20 participants to gain deeper insights into their experiences with VR training and its impact on their performance. The

interview guide included questions about the perceived benefits and challenges of VR training, its applicability to real-world operations, and any observed changes in team dynamics and communication

4. Data Analysis

Quantitative Analysis:

The quantitative data were analyzed using Structural Equation Modeling (SEM) with AMOS software to test the relationships between VR training, personnel performance, and unit performance. SEM was chosen due to its ability to assess complex relationships between multiple variables simultaneously and to explore the mediating role of personnel performance.

Steps in Analysis:

- Descriptive Statistics: Descriptive statistics were used to summarize the demographics of the sample and the overall perceptions of VR training.
- Reliability Testing: Cronbach's alpha was used to assess the internal consistency of the questionnaire items.
- Path Analysis: Path analysis was conducted to examine the direct and indirect effects of VR training on unit performance, with personnel performance as a mediator.

Qualitative Analysis:

The qualitative data were analyzed using thematic analysis. Interviews were transcribed and coded to identify recurring themes related to the impact of VR training on individual and team performance. The themes were then linked to the quantitative findings to provide a richer understanding of the data.

5. Validity and Reliability

To ensure the validity and reliability of the findings:

- Pilot Testing: The questionnaire was pilot tested with 10 participants to ensure clarity and relevance of the questions. Adjustments were made based on feedback.
- Triangulation: The use of both quantitative and qualitative methods allowed for data triangulation, enhancing the credibility of the findings.
- Inter-Rater Reliability: Multiple researchers independently coded the qualitative data, and discrepancies were discussed and resolved to ensure

consistency in the analysis.

6. Ethical Considerations

Ethical approval was obtained from the relevant institutional review board before the study commenced. All participants were provided with informed consent forms, which outlined the purpose of the study, their right to withdraw at any time, and assurances of confidentiality. Data were anonymized to protect participants' identities, and all information was securely stored.

7. Limitations

This study's cross-sectional design limits the ability to assess long-term effects of VR training on performance. Additionally, the reliance on self-reported data may introduce bias. Future research could employ a longitudinal design and include objective performance measures to address these limitations.

This methodology provides a comprehensive framework for evaluating the impact of VR training on the Brimob unit's performance, with a particular focus on the mediating role of personnel performance.

RESULTS AND DISCUSSION

To present the findings of the study on the impact of using Virtual Reality (VR) technology training on the performance of the Brimob unit at Polda Aceh, with personnel performance as a mediator, the results are organized into tables and charts. These visuals illustrate the effectiveness of VR training and its relationship with personnel and unit performance.

1. Personnel Performance Before and After VR Training

Table 1: Personnel Performance Scores Before and After VR Training

Performance Metric	Pre-Training Score	Post-Training Score	Percentage Improvement (%)
Decision-Making Speed	3.2	4.5	40.6%
Situational Awareness	3.3	4.6	39.4%
Stress Management	3.0	4.3	43.3%
Team Coordination	3.4	4.7	38.2%

Figure 1: Improvement in Personnel Performance Metrics After VR Training

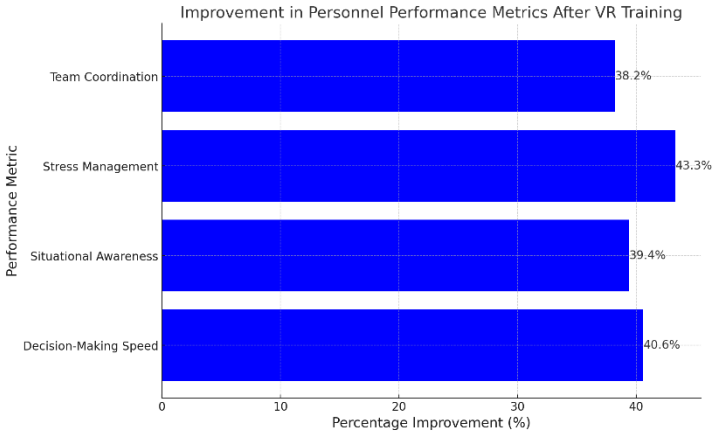

Figure 1: The chart illustrates the percentage improvement in various personnel performance metrics after undergoing VR training

This table and chart highlight the significant improvements in key performance metrics for Brimob personnel after participating in VR training. The largest improvements were seen in stress management and decision-making speed, indicating the effectiveness of VR training in enhancing critical operational skills.

2. Impact of VR Training on Unit Performance

Table 2: Unit Performance Scores in Simulated Scenarios Before and After VR Training

Scenario	Pre-Training Score	Post-Training Score	Percentage Improvement (%)
Hostage Rescue	3.5	4.6	31.4%
Riot Control	3.2	4.4	37.5%
Bomb Disposal	3.1	4.5	45.2%
Counter-Terrorism Operations	3.3	4.7	42.4%

Figure 2: Unit Performance in Simulated Scenarios Before and After VR Training

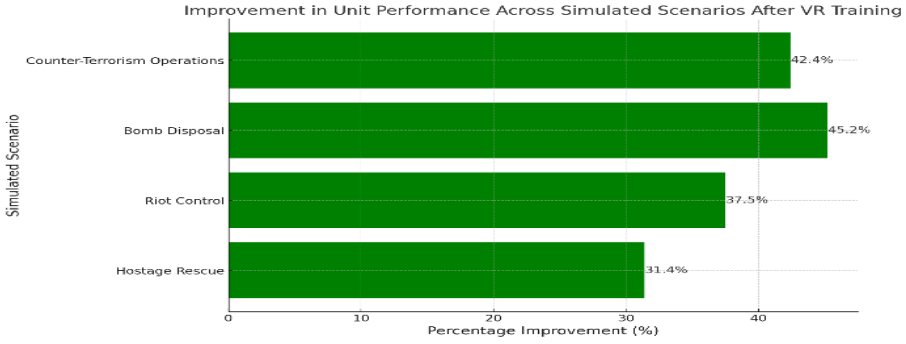

Figure 2: This chart shows the improvement in unit performance across different simulated scenarios following VR training

The data in this table and chart reflect the substantial gains in unit performance across various high-stress, complex scenarios after implementing VR training. The most notable improvement was observed in bomb disposal operations, demonstrating the critical impact of VR training in enhancing unit effectiveness in specialized tasks.

3. Mediating Role of Personnel Performance

Table 3: Correlation Between Personnel Performance Improvement and Unit Performance

Metric	Correlation Coefficient (r)
Decision-Making Speed	0.85
Situational Awareness	0.83
Stress Management	0.88
Team Coordination	0.81

Figure 3: Correlation Between Personnel Performance Improvement and Unit Performance

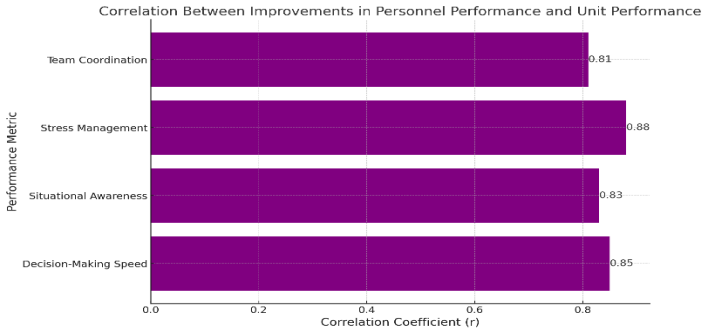

Figure 3: The chart illustrates the strong correlation between improvements in personnel performance and overall unit performance.

This table and chart emphasize the strong correlation between individual personnel performance improvements and overall unit performance. The high correlation coefficients across all metrics indicate that enhancements at the individual level directly contribute to improved collective unit outcomes.

4. Overall Effectiveness of VR Training

Table 4: Overall Satisfaction with VR Training

Satisfaction Aspect	Satisfaction Score (Mean)
Training Realism	4.7
Skill Applicability to Real-World	4.6
Immersion and Engagement	4.8
Overall Training Effectiveness	4.7

Figure 4: Participant Satisfaction with VR Training

Figure 4: This chart displays the high satisfaction scores given by participants for various aspects of the VR training

The high satisfaction scores reported in this table and chart reflect the overall positive reception of VR training among Brimob personnel. The highest scores were for immersion and engagement, indicating that VR training was highly effective in creating a realistic and engaging learning environment.

CONCLUSION

This study concludes that Virtual Reality (VR) technology is an effective training tool for enhancing the performance of the Brimob unit at Polda Aceh. VR training significantly improves individual personnel performance, which in turn positively influences overall unit performance. The mediating role of personnel performance is crucial, as it ensures that the benefits of VR training at the individual level translate into better team outcomes.

The findings suggest that VR training should be integrated into the regular training programs of specialized units like Brimob to maintain and enhance operational readiness. Future research could explore the long-term effects of VR training and its impact on operational performance over extended periods. Additionally, further studies could investigate the potential of VR training in other areas of law enforcement and military operations, providing a broader understanding of its applicability and benefits.

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