

Training Effectiveness among Sub-Inspectors of the Kerala Police Academy: An Evaluation through Structural Equation Modeling

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ABSTRACT

This study examines the effectiveness of training programmes conducted by the Kerala Police Academy, focusing on their impact on sub-inspectors' service delivery across various domains. Using data collected from 307 sub-inspectors through a structured questionnaire, the study employed CFA and SEM to analyse the outcomes. The results indicate that training had a significant positive influence on key performance areas, including improvements in professional capability, job involvement, legal proficiency (IPC and FIR), investigation skills, computer and documentation skills and emergency management. While mental fitness and communication skills showed strong improvement, physical fitness received relatively lower ratings, suggesting the need for greater emphasis in that area. Model fit indices confirmed the robustness of the SEM model, with standardised path coefficients showing strong positive relationships between training and all measured constructs. The study concludes that the Kerala Police Academy's training programmes are effective in enhancing both the technical and behavioural competencies of sub-inspectors and recommends continuous improvements in physical training and routine operational duties for more balanced development.

Keywords: Kerala Police Academy, Training effectiveness, Structural equation modelling, Sub-inspectors

1. INTRODUCTION

Training constitutes a foundational pillar in human resource development, especially within public service institutions such as the police. As articulated by Asare-Bediako (2002), training is a developmental process aimed at enhancing an individual's knowledge, skills, and attitudes—critical attributes that directly influence job performance and organizational efficiency. In contemporary organizational contexts, training is no longer viewed merely as a supplementary function but rather as a strategic imperative. It is a deliberate, structured, and systematic intervention designed not only to improve employees' existing competencies but also to prepare them for future responsibilities. Kenney and Reid (1986) further emphasize that training is essential for meeting organizational goals, as it facilitates continuous learning and professional growth.

Within the policing sector, training plays a uniquely vital role. Law enforcement officers operate in a dynamic, high-stakes environment where legal knowledge, ethical conduct, communication, crisis management, and technological competence are all simultaneously required. The effectiveness of police training programmes

directly influences public safety, citizen trust, and institutional credibility. Therefore, developing robust and comprehensive training curricula is not just desirable—it is essential. In this context, the Kerala Police Academy plays a pivotal role in equipping sub-inspectors with the knowledge, skills, and values needed to carry out their responsibilities in an effective, ethical, and professional manner.

The broader objective of police training is to build officers' capacities in multiple domains, including crime investigation, use of legal frameworks like the Indian Penal Code (IPC), effective report writing, digital documentation, handling emergency situations, and maintaining physical and mental well-being. As noted by Peak and Glensor (1999), well-designed training programmes also enable officers to apply problem-solving and community policing strategies in their daily duties. Furthermore, the pedagogical methods employed—whether through lectures, simulations, case studies, or field visits—significantly impact the learning outcomes of trainees. Training, when implemented effectively, fosters a culture of professionalism, ethics, and public service within the police force.

However, despite the growing emphasis on capacity building, there is often a disconnect between training efforts and their actual impact on job performance. As Buerger (1998) and Fogelson (1977) have observed, many police reform efforts hinge on the implementation of new or enhanced training initiatives. Yet, measuring the actual effectiveness of such training remains a challenge. One widely accepted model for evaluating training impact is Kirkpatrick's (1994) four-level framework, which includes: (1) Reaction, (2) Learning, (3) Behaviour, and (4) Results. Although this model provides a comprehensive basis for assessment, many studies disproportionately focus on the first two levels—how participants feel about the training and what they learned—while ignoring the more critical dimensions of behaviour change and tangible organizational outcomes.

The gap in empirical research is particularly evident in public sector training evaluations, including policing. Studies conducted by Kassem (2018), Homklin (2014), and Aziz (2013) have shown that only a limited number of training assessments engage with all four levels of the Kirkpatrick model. Moreover, very few studies investigate the causal relationships among these levels, or the potential moderating roles of individual characteristics and work environments. This gap is especially concerning in high-responsibility professions like policing, where inadequate training assessment can lead to suboptimal performance, reduced public trust and inefficient service delivery. To address this gap, the present study aims to systematically evaluate the effectiveness of training programmes conducted by the Kerala Police Academy.

The results of the study are expected to contribute both theoretically and practically. Theoretically, it provides empirical evidence supporting the use of multidimensional training assessments within the public sector. Practically, it offers actionable insights for police administrators, training coordinators, and policymakers to refine training modules, adopt effective pedagogical strategies, and allocate resources efficiently. In doing so, the study reinforces the importance of training as a vehicle for organizational transformation and enhanced public service delivery.

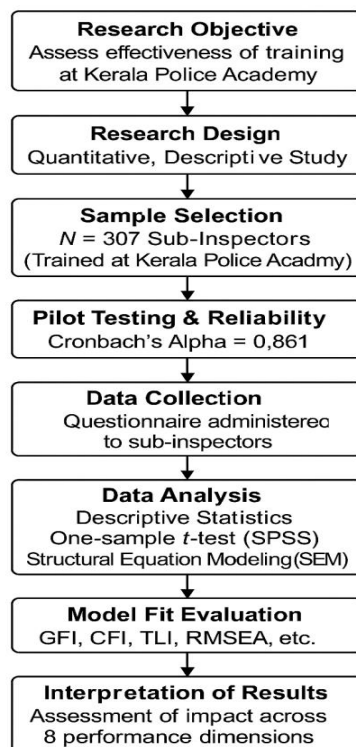
II. MATERIALS AND METHODS

This study aimed to evaluate the effectiveness of training programmes conducted by the Kerala Police Academy (KPA), with a focus on their impact across multiple dimensions of sub-inspectors' professional performance. The research employed a quantitative approach. Over the past four years, 624 sub-inspectors graduated from the Kerala Police Academy. From this population, 317 sub-inspectors were selected using simple random (lottery) sampling, of whom 307 provided complete responses. Accordingly, the final sample size was 307.

Data were collected using a structured questionnaire specifically designed to assess perceived improvements in key domains, including capability development, job involvement, legal knowledge (IPC and FIR), investigation proficiency, routine policing responsibilities, computer and documentation skills, emergency management ability, and physical and mental health. Each item was measured on a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). To ensure the reliability of the instrument, a pilot study was conducted. The Cronbach's alpha value obtained was 0.861, indicating high internal consistency and reliability of the questionnaire. Validity was further supported through expert review and item refinement prior to the full rollout. The collected data were analysed using SPSS. In addition, CFA Structural Equation Modeling (SEM)

was employed using AMOS software to examine the relationships between training and various outcome constructs. This robust methodological framework (Fig 1) allowed for a comprehensive evaluation of how training influenced different aspects of sub-inspectors' performance, offering both statistical significance and theoretical insight into training effectiveness in the policing context.

Figure 1: Methodological Framework



III. RESULTS

Police training plays a crucial role in enhancing both the physical and mental well-being of police personnel. It is a complex and multifaceted area, encompassing various educational elements and shaped by institutional policies and frameworks (Wilson et al., 2010). Typically, training is known to have a positive impact on job performance. In light of this, the present study examines how training influences the service delivery of sub-inspectors. Specifically, this section analyses the effectiveness of training programs conducted by the Kerala Police Academy on sub-inspectors' performance using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM).

Convergent Validity

Convergent validity of the measurement model was examined using the criteria proposed by Fornell and Larcker (1981), namely factor loadings, composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha. The results indicate that all measurement items loaded strongly on their respective constructs. Specifically, factor loadings ranged from 0.814 to 0.876, exceeding the recommended minimum threshold of 0.50 suggested by Hair et al. (2006). This demonstrates that each item adequately represents its underlying construct. Further, the composite reliability values, which ranged between 0.910 and 0.937, were well above the acceptable benchmark of 0.70 (Hair et al., 2010). This confirms a high level of internal consistency among the indicators within each construct. In addition, the average variance extracted (AVE) values for all constructs were greater than 0.70, surpassing the minimum requirement of 0.50 (Fornell & Larcker, 1981). This suggests that the constructs explain a substantial proportion of variance in their respective indicators.

Cronbach's alpha values, ranging from 0.888 to 0.921, further support the reliability of the measurement model, indicating strong internal consistency across all constructs (Hair et al., 2014). Collectively, these results confirm

that the constructs measuring training effectiveness for Sub-Inspectors demonstrate adequate convergent validity, validating that the items within each construct are conceptually and empirically related (Table 1).

Table 1: Constructs and Items — Training Effectiveness for Sub-Inspectors

Constructs / Items	Factor Loadings	Cronbach α	C.R.	AVE
Improvements in Capability				
Acquired skills to manage diverse and heterogeneous populations	0.847	0.921	0.937	0.714
Strengthened sense of loyalty and integrity	0.861			
Gained a deeper understanding of human rights principles	0.834			
Developed awareness of emerging trends in criminal activity	0.819			
Enhanced legal knowledge and understanding of applicable laws	0.876			
Improved familiarity with investigative tools and techniques	0.843			
Acquired foundational knowledge in crime investigation procedures	0.858			
Involvement in Job		0.903	0.918	0.736
Cultivated strong professional ethics	0.872			
Fostered enthusiasm and commitment to public service	0.841			
Enhanced overall sense of professionalism	0.863			
Developed a forward-looking vision for career progression in policing	0.829			
Proficiency in IPC and FIR		0.897	0.912	0.722
Gained understanding of relevant IPC sections applicable in FIR preparation	0.854			
Improved ability to assess the relevance of evidence in line with the IEA	0.839			
Developed skill in selecting appropriate IPC sections based on case briefs	0.867			
Acquired knowledge to apply suitable provisions of the State Minor Acts in FIR documentation	0.821			
Proficiency in Investigation		0.909	0.924	0.708
Learned proper procedures for collecting and packaging digital evidence	0.843			

Constructs / Items	Factor Loadings	Cronbach α	C.R.	AVE
Gained understanding of appropriate investigative procedures under the CrPC	0.858			
Acquired knowledge of relevant sections of major acts for inclusion in FIRs	0.831			
Developed the ability to formulate effective questionnaires for forensic examination	0.816			
Enhanced capability to distinguish between cases of unnatural death and suicide	0.847			
Proficiency in Routine Duties & Responsibilities of Police		0.906	0.921	0.701
Acquired knowledge of various wings of the police force and their respective functions	0.839			
Gained familiarity with relevant sections of the Police Act applicable to daily duties	0.852			
Developed the ability to conduct independent crime investigations	0.861			
Learned the procedure for applying relevant police standing orders	0.828			
Acquired the skill to organize and conduct Friday parades effectively	0.814			
Proficiency in Computer and Documentation Skills		0.914	0.929	0.715
Gained the ability to create electronic visual presentations (e.g., PowerPoint)	0.831			
Developed skills to analyze specific data using spreadsheet tools such as Excel	0.844			
Acquired proficiency in drafting investigation reports using desktop publishing tools	0.857			
Learned to prepare FIRs using the CCTNS software	0.869			
Became proficient in using iAPS software for processing electronic case files	0.842			
Developed the ability to make accurate entries in various registers at the police station	0.823			
Ability to Manage Emergencies		0.893	0.910	0.718
Acquired life-saving skills, such as rescuing a drowning child	0.836			
Gained proficiency in the safe and effective use of police weapons	0.851			

Constructs / Items	Factor Loadings	Cronbach α	C.R.	AVE
Developed resilience to cope with high-pressure situations and adversity	0.863			
Enhanced capability to respond effectively to disaster and emergency situations	0.847			
Physical and Mental Health		0.888	0.906	0.707
Improved overall physical fitness and stamina	0.844			
Strengthened mental resilience and psychological well-being	0.858			
Developed effective communication and persuasion skills	0.831			
Acquired the ability to perform and demonstrate various Yoga asanas	0.819			

Discriminant Validity

Discriminant validity was assessed to determine the extent to which each construct is distinct from other constructs in the model. Following the Fornell–Lareker criterion, the square root of the AVE for each construct was compared with the inter-construct correlations. As presented in Table 2, the square root of AVE values (diagonal elements) for all constructs were higher than their corresponding correlations with other constructs.

This finding indicates that each construct shares more variance with its own indicators than with other constructs, thereby confirming adequate discriminant validity. In other words, while the dimensions of training effectiveness such as improvement in capability, investigative proficiency, emergency management and physical and mental health are related, they remain empirically distinct and measure unique aspects of Sub-Inspector training outcomes.

Table 2: Discriminant Validity (HTMT / Square Root of AVE on Diagonal)

	1	2	3	4	5	6	7	8
1. Improvements in Capability	(0.845)							
2. Involvement in Job	0.623	(0.858)						
3. Proficiency in IPC and FIR	0.651	0.604	(0.850)					
4. Proficiency in Investigation	0.672	0.591	0.698	(0.842)				
5. Proficiency in Routine Duties	0.638	0.617	0.671	0.683	(0.837)			
6. Proficiency in Computer Skills	0.594	0.572	0.643	0.661	0.649	(0.846)		
7. Ability to Manage Emergencies	0.601	0.583	0.619	0.637	0.628	0.612	(0.847)	
8. Physical and Mental Health	0.578	0.564	0.597	0.614	0.603	0.589	0.631	(0.841)

SEM Approach

In accordance with the methodological guidelines proposed by Hair et al. (2010), the SEM approach has been employed in this section to examine the relationships among the variables associated with the effectiveness of training. SEM is particularly well-suited for this type of analysis, as it allows for the simultaneous evaluation of multiple dependent and independent variables, thereby offering a comprehensive understanding of the underlying structural relationships. Through this technique, standardized regression coefficients (also known as path coefficients) are generated, which quantify the strength and direction of the associations between the constructs in the model. These coefficients provide valuable insights into the extent to which each variable influences the overall effectiveness of the training programme.

Table 3: Regression Weights for Training Effectiveness

Variables		B	S.E.	C.R.	p	β
Improvements in Capability	<-- Effect of Training	1.00				.64
Involvement in Job	<-- Effect of Training	1.38	.14	10.14	***	.81
Proficiency in IPC and FIR	<-- Effect of Training	1.24	.14	8.65	***	.72
Proficiency in Investigation	<-- Effect of Training	.90	.10	8.62	***	.70
Proficiency in Routine Duties & Responsibilities of Police	<-- Effect of Training	.72	.09	8.14	***	.58
Proficiency in Computer and Documentation Skills	<-- Effect of Training	.91	.09	9.97	***	.73
Ability to Manage Emergencies	<-- Effect of Training	1.08	.10	10.64	***	.68
Physical and Mental Health	<-- Effect of Training	.49	.09	5.45	***	.34

The unstandardized regression analysis revealed that multiple variables exert a statistically significant and positive influence on the perceived effectiveness of training programs for sub-inspectors ($p < .05$). Specifically, an improvement in individual capability emerged as a strong predictor ($B = 1.00$), suggesting that enhanced personal skills and competencies directly contribute to better training outcomes. Likewise, job involvement demonstrated the highest coefficient ($B = 1.38$), indicating that increased engagement and commitment to one's professional role significantly amplify the benefits derived from training (Table 3).

Furthermore, proficiency in legal procedures, particularly in the Indian Penal Code (IPC) and First Information Report (FIR) documentation, showed a substantial effect ($B = 1.24$), underscoring the importance of legal knowledge and procedural accuracy. Proficiency in investigation techniques ($B = 0.90$) and in handling routine duties and responsibilities of the police force ($B = 0.72$) also contributed positively, reflecting the practical, day-to-day relevance of these skills in operational effectiveness.

In addition, the ability to use computers and perform documentation efficiently ($B = 0.91$) was found to significantly enhance training impact, pointing to the growing relevance of digital literacy in modern policing. The capacity to manage emergencies ($B = 1.08$) also emerged as a critical factor, highlighting the need for crisis preparedness in police training modules. Finally, improvements in physical and mental health ($B = 0.49$), though relatively lower in magnitude, still played a meaningful role in influencing training effectiveness, emphasizing the holistic nature of police preparedness.

These findings collectively suggest that training programs that comprehensively address both technical competencies and personal development dimensions are more likely to yield effective and sustainable outcomes in law enforcement performance.

Table 4: Model Fit Measures for the Effectiveness of Training

χ^2	GFI	AGFI	CFI	IFI	TLI	RMSEA
135.4	.93	.90	.92	.88	.89	.034

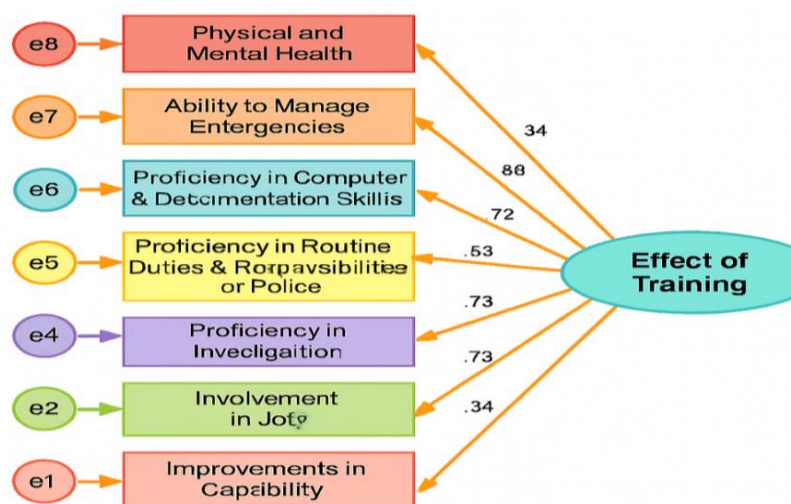
The model fit indices indicate that the structural equation model developed to assess the effectiveness of training for sub-inspectors exhibits an adequate to good fit with the observed data (Table 3). The chi-square value ($\chi^2 = 135.4$, $p < .05$) is statistically significant, which is expected in models with larger sample sizes; therefore, additional fit indices provide a more comprehensive understanding of model adequacy. The Goodness of Fit Index (GFI = 0.93) and the Adjusted Goodness of Fit Index (AGFI = 0.90) both exceed the recommended threshold of 0.90, suggesting a satisfactory overall fit. Similarly, the Comparative Fit Index (CFI = 0.92) further reinforces the model's validity.

Although the Incremental Fit Index (IFI = 0.88) and Tucker-Lewis Index (TLI = 0.89) fall slightly below the ideal 0.90 benchmark, they still indicate an acceptable fit for practical applications. Most notably, the Root Mean Square Error of Approximation (RMSEA = 0.034) is well below the conventional cutoff of 0.08, aligning with the criteria set by Browne and Cudeck (1992). This low RMSEA value implies minimal discrepancy between the hypothesized model and the observed data, thereby confirming the model's suitability for evaluating the effectiveness of the training program.

In terms of structural relationships, the standardized path coefficients highlight the strength and direction of influence that the training has on various outcome variables. The results indicate that sub-inspectors' training has a strong positive impact on several key areas. These include improvement in individual capability ($\beta = 0.64$), job involvement ($\beta = 0.81$), proficiency in IPC and FIR procedures ($\beta = 0.72$), investigative skills ($\beta = 0.70$), computer and documentation proficiency ($\beta = 0.73$), and the ability to manage emergencies ($\beta = 0.68$). These high beta values suggest that the training initiatives effectively enhance both technical skills and engagement levels among sub-inspectors.

In addition, the training program demonstrated a moderate yet meaningful influence on proficiency in routine duties and responsibilities ($\beta = 0.58$) and on physical and mental health ($\beta = 0.34$). While these coefficients are somewhat lower compared to the other variables, they still reflect important dimensions of professional readiness and overall well-being. Taken together, the findings underscore the comprehensive impact of the training provided by the Kerala Police Academy, suggesting that the program is successful in fostering both skill development and holistic preparedness among sub-inspectors. The structural model, as visualized in Figure 2, effectively captures the multidimensional impact of training on key outcome variables.

Figure 2: SEM for Effectiveness of Training



IV. MANAGERIAL IMPLICATIONS

The findings of this study provide several important managerial implications for the Kerala Police Academy and other law enforcement training institutions. First, the significant improvement observed across key competencies—such as investigation skills, legal knowledge, computer proficiency, and emergency response—indicates that structured and focused training programs can greatly enhance the operational readiness of sub-

inspectors. Therefore, training authorities should continue to invest in and update these core areas while ensuring alignment with the evolving demands of modern policing.

Second, the relatively lower scores in aspects like physical fitness and application of routine police procedures suggest a need to re-evaluate the design and delivery of these components. Managers should consider incorporating more practical, scenario-based exercises, and fitness-oriented modules to ensure holistic development. Collaborations with fitness professionals and legal experts may further enrich the curriculum.

Third, the strong impact of training on job involvement, professional ethics, and mental well-being highlights the value of integrating psychological preparedness and ethical frameworks into the training process. This reinforces the importance of a balanced approach that not only builds technical capacity but also promotes resilience, motivation, and a strong sense of duty among officers.

Moreover, the findings suggest that digital skills are increasingly essential in modern policing. As such, training managers should prioritize digital literacy—particularly in the use of policing software like CCTNS and iAPS—as a standard part of induction and refresher training programs.

Lastly, continuous evaluation of training effectiveness through structured feedback and performance assessment tools should be institutionalized. This will enable training managers to make data-driven decisions and tailor programs based on actual field requirements and performance outcomes, thereby fostering a culture of continuous improvement within the police force.

V. CONCLUSION

The study conclusively demonstrates that the training provided by the Kerala Police Academy has a significant and positive impact on the professional development and service delivery of sub-inspectors. The results highlight substantial improvements in various domains, including investigative proficiency, legal awareness, job involvement, computer and documentation skills, and the ability to handle emergencies. The training also contributed positively to mental well-being and ethical orientation, although areas like physical fitness and routine policing duties require further enhancement.

Statistical analysis through Structural Equation Modeling and single-sample t-tests confirmed the robustness of these outcomes. The findings reinforce the critical role of structured training in equipping sub-inspectors with the necessary skills, knowledge, and attitudes to perform effectively in a complex and evolving policing environment.

Overall, the study underscores the importance of continuous, comprehensive, and needs-based training programs in strengthening the capabilities of law enforcement personnel. These insights can guide future training strategies and policy decisions aimed at building a more competent, responsive, and resilient police force.

Acknowledgement

The authors would like to thank the officials and training officers and trainees of the Kerala Police Academy for providing the necessary data for conducting the study. However, all the contents in this paper are the authors' responsibility.

References

1. Asare-Bediako, K. (2002). Professional skills in human resource management. Kasbed Ltd.
2. Aziz, S. F. A. (2013). Measuring training effectiveness: Evidence from Malaysia. *Journal of Social Sciences & Humanities*.
3. Buerger, M. E. (1998). Police training as a Pentecost: Using tools singularly ill-suited to the purpose of reform. *Police Quarterly*, 1(1), 27–63.
4. Fogelson, R. M. (1977). *Big-city police*. Harvard University Press.
5. Gandomkar, R. (2018). Comparing Kirkpatrick's original & new model with CIPP evaluation model. *Journal of Advances in Medical Education & Professionalism*, 6(2), 94–95.

6. Graham, S., & Marvin, S. (2002). Telecommunications and the city: Electronic spaces, urban places. Routledge. <https://books.google.com/books?hl=en&lr=&id=sakHAgAAQBAJ>
7. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). Multivariate data analysis (7th ed.). Pearson Education.
8. Homklin, T. (2014). Training effectiveness of skill certification system: The case of automotive industry in Thailand [Doctoral dissertation, Hiroshima University].
9. Kassem, A. M. (2017). Application of Kirkpatrick evaluation model for optimization of assessment practices in an EFL context. *Research Gate*, 4(2), 19–45.
10. Khalid, M., Ashraf, M., & Rehman, C. A. (2012). Exploring the link between Kirkpatrick (KP) & context, input, process & product (CIPP) training evaluation models, and its effect on training evaluation in public organizations of Pakistan. *Human Resource Development Quarterly*, 11(4), 333–336.
11. Kirkpatrick, D. L. (1994). Evaluating training programs: The four levels. Berrett-Koehler Publishers.
12. Masood, R. Q., & Usmani, M. A. W. (2015). Evaluation of medical teacher's training program through Kirkpatrick's model. *Khyber Medical University Journal*, 7(2).
13. Mensah, R. O. (2019). Social outcomes of training practices in the Ghana Police Service. *Research on Humanities and Social Sciences*, 9, 69–82.
14. Peak, K. J., & Glensor, R. W. (1999). Community policing and problem solving: Strategies and practices. Prentice Hall.
15. Wilson, J. M., Dalton, E., Scheer, C., & Grammich, C. A. (2010). Police recruitment and retention for the new millennium. RAND Corporation. <https://doi.org/10.7249/RB9546>