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# Facilitation of the ongoing development of fingerprint subject matter expertise

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## ABSTRACT

Although considerable expertise exists in the fingerprint domain, there are opportunities for improvements to be made regarding the development and maintenance of expertise, and in the reliable application of scientific methods and principles. Here, we propose a framework for the facilitation of ongoing development of fingerprint subject matter expertise in order to improve reliability and minimize errors. We describe two essential elements to support ongoing development: scientific leadership and continued education. Furthermore, we recommend that examiners should be exposed to opportunities for practice and feedback on the full myriad of tasks that they engage in (e.g. comparisons, report writing, court presentations, and evaluation of the latest scientific developments). These elements and the rationale behind them are discussed here in detail.

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Fingerprints; expert; leadership; education; development; professionalism

## 1. Introduction

Historically, on completion of training, fingerprint experts will obtain their certificate of fingerprint expertise and are then embedded into their core functions; evidence recovery, fingerprint analysis, and interpretation and reporting. There is often no requirement for ongoing education <sup>1</sup>. Currently, no framework exists for continuing education of contemporary issues and no mandatory platform has been established for the collective expansion and continuing training and assessment of subject matter expertise. Furthermore, operational environments are not always led by persons with an in-depth knowledge of scientific principles or experience in applying the scientific method. If fingerprint experts do not have access to or are not engaging in continued education in order to keep up with innovations in technology, science, and interpretation and reporting formats, then there is a real risk that fingerprint subject matter expertise cannot be maintained or improved. Positively, the Australasian Forensic Field Sciences Accreditation Board (AFFSAB), have introduced a 5-yearly recertification for practitioners, requiring proof of participation in the maintenance of professional development <sup>2</sup>. Here, we further propose that scientific leadership and mandatory continuing education will

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assist in further improving fingerprint subject matter expertise to increase reliability, minimize bias and reduce errors.

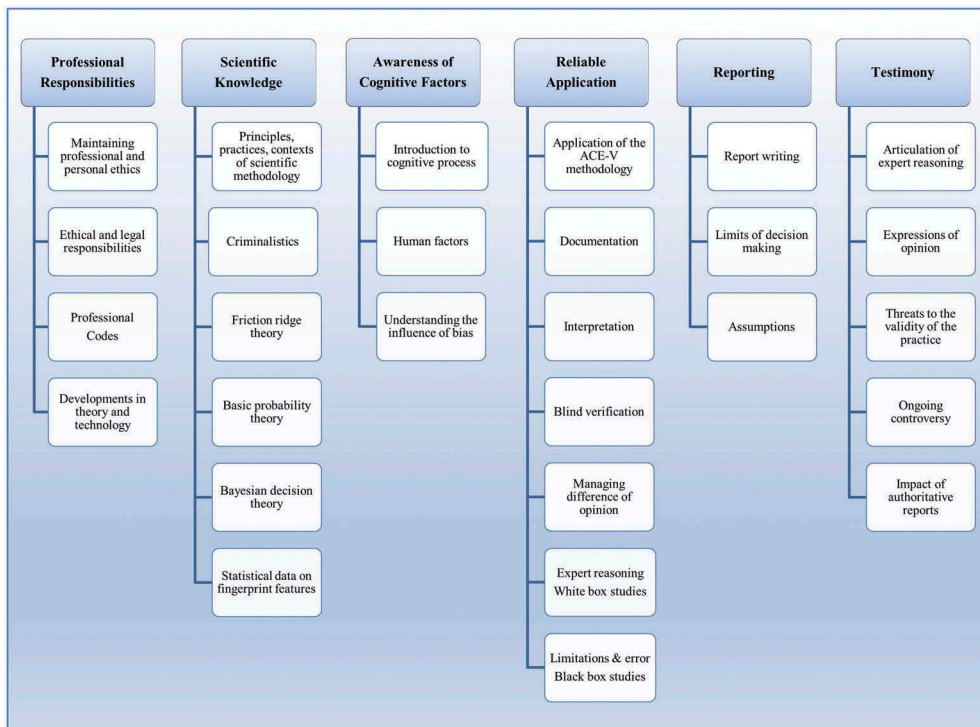
## 2. Scientific leadership

A *scientific leader* is one that: promotes the development, support, and maintenance of overall scientific health; identifies subject matter specialists; creates collaborative networks; and will engage, coach and mentor staff in research and development opportunities. Such leadership will contribute to and support unbiased decision-making and promote safe justice outcomes. We suggest that those managers with a comprehensive understanding of the scientific principles of evidence interpretation and reporting, and experience in applying the scientific method are best placed to understand the importance of enabling the progression of scientific initiatives, actively engage with external sources, promote best practice, and contribute to the ongoing development of fingerprint examiners. Most importantly, such leaders can provide support for the expansion of fingerprint examiner subject matter expertise. Where scientifically-trained managers are not available, identified subject matter specialists should assist operational management in the education of principles underpinning the science. Forensic laboratories and fingerprint examiners can learn from each other and from other industries to improve procedures and understand human factors considerations <sup>3</sup>. As such, scientific leaders should support and encourage examiner contributions to working groups, educational workshops, research projects and international symposia in order to establish beyond-border networks and to keep up-to-date with academic and operational innovations. When knowledge is obtained, transfer of this knowledge should be mandatory in order to have collective benefit within an agency.

## 3. An educational framework

Significant commonality exists throughout authoritative reports when recommending ways to improve scientific practice, with emphasis placed on the need for continued education to preserve and improve expertise <sup>1,3,4</sup>. For example, the Scottish Fingerprint Inquiry states that 'the reliability of fingerprint evidence depends not only on the initial training of examiners but on arrangements for their continuing development and competence, and quality assurance measures to check the reliability of their work' (4, p. 710). In addition, the NIST report on human factors in latent print analysis states that 'management should be aware of the skills and expertise of examiners in order to identify gaps that could be eliminated through continuing education and training' <sup>3</sup>. A practical example of how continued education has improved latent print practice is how following a review into the Mayfield misidentification, the FBI recognized a major training gap and made significant changes to prevent such an error occurring again. These changes included providing examiners with comprehensive training on friction ridge theory and application of the ACE-V methodology <sup>5</sup>.

We suggest that expert knowledge can be developed around an educational framework comprising six main interrelated topics (see [Figure 1](#)): professional responsibilities; scientific knowledge; awareness of cognitive factors; reliable application; reporting; and



**Figure 1.** Educational framework for the continual development of fingerprint subject matter expertise.

testimony. We emphasize that these are only suggestions as a starting point for discussion among the latent print community. We do, however, strongly recommend that, regardless of how the framework transpires, examiners have opportunities for practice and feedback on the myriad of tasks that they engage in (e.g. comparisons, report writing, court presentations, and evaluation of the latest scientific developments). The development and implementation of such a comprehensive training programme will require expertise of fingerprint examiners, management, academics, legal, cognitive specialists and statisticians. Furthermore, such a programme will benefit from having national governance to implement, guide and support the process.

#### 4. Conclusion

For forensic disciplines to evolve and adapt to scientific advancements, scientific leadership is imperative. Scientific leaders should progress scientific initiatives, actively engage with external sources, promote best practice, and contribute to the ongoing development of fingerprint expertise. An educational framework that enhances and improves current fingerprint practices can be developed around trends and recommendations in authoritative reports. Continued education based on the proposed educational framework will aid in closing critical knowledge gaps and promote scientific advancement. Successful implementation requires the necessary support and

guidance from scientific leaders. The development and implementation of this educational framework should be considered with the view to becoming mandatory for all fingerprint examiners.

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