WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Competencies of Police Investigators in Taking Standard Fingerprints

Raul Patrick R. Abella [a]*

[a] *St. Anthony's College, San Jose de Buenavista, 5700, Antique, Philippines*
DOI : https://doi.org/10.55248/gengpi.6.0825.3078

A B S T R A C T

This descriptive research determined the competencies in taking standard fingerprint by police investigators in Western Visayas towards the development of a proposed training design in taking standard fingerprint. To achieve this end, the 79 police investigators in Western Visayas were considered as respondents of the study and were classified according to their years in service, bachelor's degree, and rank. The researcher utilized a validated and reliability tested researcher-made instrument adapted from Agunos and Diaz (2019) to determine the competencies of police investigators in taking fingerprint. The statistical tools used were frequency count, percentage, mean, standard deviation, One-way MANOVA. The findings of the study revealed that the level of competencies of the police officers in taking fingerprint in terms of knowledge when grouped according to bachelor's degree, years of service, and rank was excellent. Also, the level of competencies of the police officers in taking fingerprint in terms of skills when grouped according to bachelor's degree, years of service, and rank was good. Moreover, there is no significant difference in the level of competencies of the police officers in taking fingerprint in terms of knowledge when grouped according to bachelor's degree, years of service, and rank. Also, no significant differences existed in the level of competencies of the police officers in taking fingerprint in terms of skills when grouped according to bachelor's degree, and years of service but significant differences existed when grouped as to rank. A proposed design in taking fingerprint was developed based on the findings of the study.

Keywords: Competencies, Police Investigators, Standard Fingerprints

1. Introduction

The competence of police investigators to take fingerprints is critical for the effective utilization of fingerprint evidence in criminal investigations. It necessitates a blend of technical capabilities, on-going training, meticulous attention to detail, legal understanding, and ethical integrity. Ensuring good standards in these areas contributes to the reliability and credibility of fingerprint evidence, which is crucial to solving crimes and attaining convictions. In crime investigations, fingerprints are an important tool for identifying victims and locating prospective criminal offenders (Richman & Seo, 2022). Fingerprints, which are the replication of friction ridge patterns on the surface areas of the human finger, palm, or sole (Fingerprint Identification Society of the Philippines, Inc., 2013), have long been widely used as the standard for identifying people (Mishra, 2022). Because fingerprints are distinct and unique to each individual, every fingerprint left at a crime scene may aid in the resolution of crimes by immediately identifying concerned individuals who may be brought in for questioning and inquiry. This is made possible by using excellent fingerprint scanning. And as technology has advanced in this era, fingerprint scanning has also improved.

From the manual process of fingerprint analysis, through which the basic shape 3 of the print is examined first by a firm press of the thumb in black ink to reveal the print ridges and is stored for analysis, different fingerprint scanning technologies have evolved, such as infrared laser ablation technology, advanced fingerprint identification technology, and color-changing fluorescent film (Fakiha, 2020). With these developments, the police force must adapt to new technologies. In fact, according to Edmond et al. (2021), investigators are needed to keep up with modern fingerprinting processes and technologies. Keeping up with these improvements is critical to ensure the effectiveness of fingerprinting techniques in criminal investigations. Furthermore, Fakiha (2020) emphasized the crucial importance of thorough training to overcome any potential deficiencies in knowledge and skills. Insufficient training presents a significant obstacle, which may lead to investigators lacking the requisite expertise in both fingerprint collection and analysis.

Law enforcement agencies must recognize and address these challenges to maintain the reliability of fingerprint evidence, improve investigative outcomes, and improve the general effectiveness of criminal justice systems. Efforts should be directed toward fostering continual education and professional development to provide investigators with the skills required to navigate the ever-changing world of fingerprinting technology and processes. Similarly, Prislan and Slak (2018) noted that the lack of established techniques in fingerprint capture and processing poses a significant difficulty, potentially leading to mistakes and limiting fingerprint comparability across several cases. The absence of uniformity in methodology raises issues about the reliability and consistency of fingerprint studies, which can have serious consequences for criminal justice systems. Law enforcement authorities must recognize and address these problems.

The repercussions of this lack of uniformity include the possibility of false matches and erroneous identifications, which pose a significant risk to the integrity of criminal investigations and legal procedures. To reduce these dangers and improve the reliability of fingerprint evidence, investigators must follow universally agreed protocols 4 for collecting, handling, and analyzing fingerprints. The use of standardized methods will not only improve the accuracy of forensic analyses but will also encourage a more reliable and fair criminal justice system. Recognizing the need for consistency in fingerprint practices is important for maintaining the trust and validity of fingerprint evidence in the larger context of forensic science and criminal investigations.

Consequently, this study aimed to assess the significance and practicality of both investigative competence and preliminary functional police abilities within the wider scope of general policing duties. It also aimed to create a framework for defining supplementary operational policing skills that are considered essential for obtaining success in the investigator position within the field of general law enforcement. Moreover, this study sought to examine the perceived competency of police investigators in the specific area of taking standard fingerprints, acknowledging the crucial importance of proficient skills in a criminal investigation. It may provide valuable insights into the broader landscape of policing practices and the specific capabilities needed for effective investigative roles within law enforcement agencies by examining the self-assessment of competencies by police investigators in this specialized skill set.

1.1 Theoretical Framework

The study is based on Skills Acquisition Theory (Dreyfus & Drefus, 1980), which provides a comprehensive framework for understanding the complex process of developing expertise in fingerprinting, revealing a progressive evolution from a beginner to an expert. This theoretical framework suggests that humans go through specific phases of acquiring skills, with each step requiring more advanced cognitive processing and behaviors. These are necessary for becoming proficient in the complexities of fingerprint analysis. Practitioners progress through these stages by gaining deep knowledge and experience at each point, which leads to the development of more complex skills. The approach emphasizes the essential importance of focused training, constructive evaluation, and practical involvement in developing investigators' skills. By embracing this theoretical framework, investigators participate in an ongoing process of acquiring knowledge, implementing new insights, and enhancing their abilities through real-world feedback and practical experiences.

Another, the Competence Motivation Theory by Harter (1978), seeks to explain the internal drive that motivates individuals to actively engage, persevere, and dedicate effort in particular achievement settings. The core principle of this theory suggests that individuals have an inherent inclination towards activities in which they view themselves as skilled, highlighting the significant influence of perceived competence as a strong motivator. It provides a sophisticated comprehension of the dynamic relationship between motivation and competence, stating that individuals are more inclined to actively participate and consistently invest effort when they perceive themselves as competent in a specific field. Competence Motivation Theory also provides valuable insights into how individuals navigate various learning contexts, impacting their behaviors, choices, and commitment based on their perceived level of competence. Harter's theory is a fundamental framework that enhances the comprehension of the complex connection between motivation and perceived competence. It provides vital insights into the fields of education, psychology, and human accomplishment.

The study is likewise anchored on the Organizational Culture Theory by Schein (2010), which emphasizes first the degree of consistency of beliefs, values, assumptions, and practices among organizational members. Another emphasis is on the pervasiveness (number) of consistent beliefs, values, assumptions, and practices.

1.2 Conceptual Framework

This study determined the competence of police investigators in taking standard fingerprints, drawing upon the theoretical frameworks of Skills Acquisition Theory, Competency Motivation Theory, and Organizational Culture Theory.

The independent variables involve a comprehensive review of the police investigators' demographic characteristics, such as baccalaureate degree, length of service, and rank. These demographic insights offer a picture of the features within the group essential for comprehending the intricacies of acquiring knowledge and skills to determine the respondents' competencies in taking standard fingerprints. The dependent variables focus on determining the investigators' competence, including their knowledge and skills in adherence to standard fingerprinting protocols. The study utilized the Competence Motivation Theory to identify the motivational 8 aspects that impact investigators' dedication to improving their fingerprint competencies. Moreover, the organizational culture theory is a conceptual framework to examine how the institutional environment influences and strengthens these abilities. This study was geared toward condensing its findings into a proposed training design for police investigators involved in fingerprint analysis.

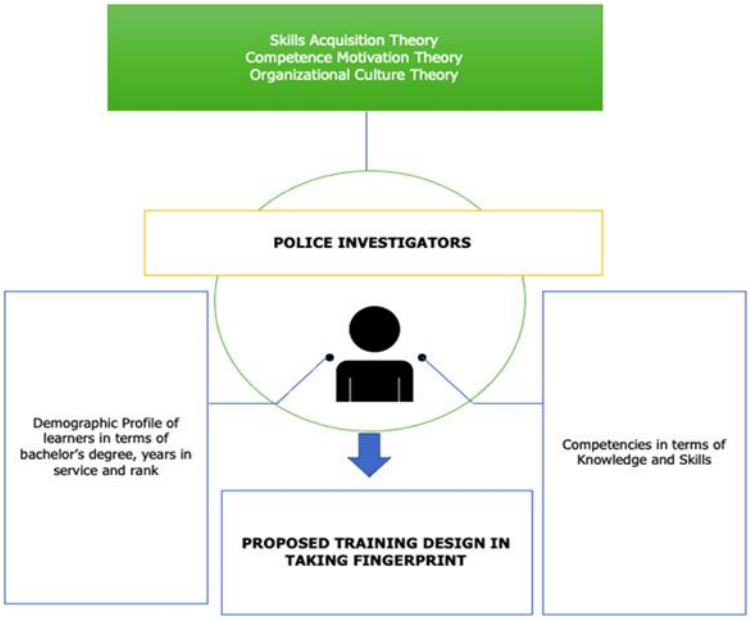

Fig. 1 – Research Paradigm

1.3 Statements of the Problem

This study aimed to determine the competencies in taking standard fingerprints by police investigators in Western Visayas for the year 2022 – 2023, towards the development of a proposed training design in taking standard fingerprints. Specifically, it sought answers to the following questions:

1. What is the level of competencies of police investigators in taking standard fingerprints in terms of knowledge and skills as an entire group, and when classified according to bachelor's degree, years of service, and rank?

2. Are there significant differences in the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills when classified according to their bachelor's degree, years of service, and rank?

3. Based on the results of the study, what training design for taking fingerprints may be proposed?

1.4 Hypothesis

There are no significant differences in the level of competencies of police investigators in taking standard fingerprints in terms of knowledge and skills when grouped according to bachelor's degree, years of service, and rank.

2. Methodology

The study used a descriptive research design using the survey method to determine the competencies of police investigators in taking standard fingerprints in Western Visayas. According to McCombes (2019), descriptive research aims to describe a population, situation, or phenomenon accurately and systematically. It can answer what, where, when, and how questions, but not why questions. As pointed out by Shuttleworth (2008), descriptive research design is a scientific method that involves observing and describing the behavior of a subject without influencing it in any way.

For the descriptive type of research, the best-suited research approach for collecting primary data is the survey technique using the questionnaire method. From a sample, data is collected, and the different magnitudes are measured concerning the whole population (Copper, 2006). Recognized as the gold standard for understanding people's perspectives, 37 attitudes, beliefs, and routines across diverse topics, surveys offer a comprehensive tool for data gathering. The detailed insights gained from the survey responses contribute to a nuanced understanding of the subject matter under investigation. Since this study delved into collecting and intensifying primary data to describe the police investigators' level of competency in taking standard fingerprints, a descriptive survey design is deemed appropriate.

2.1 Respondents

The seventy-nine (79) police investigators in Western Visayas were the respondents to this study. A purposeful sampling technique was used in determining the sample size. They were categorized based on their bachelor's degree, years of service, and rank. In terms of their bachelor's degree, there were 56 (71%) criminology graduates, and 23 (29%) were non-criminology graduates. In terms of years in service, 44 (56%) have served below

13 years, and 35 (44%) have served 13 years and above. In terms of rank, 54 (68%) were patrolmen to police staff sergeants, and 25 (32%) were police sergeants to police executive master sergeants.

The criteria for selecting respondents include: (a) current employment as a police investigator in the study locale, (b) both male and female, (c) ages ranging from 21 to 55 years old, and (d) a minimum of 1 year of law enforcement experience. This targeted approach ensured that the chosen respondents possess the necessary experience and qualifications relevant to the study's objectives.

Table 1- Distribution of Respondents

Category	f	%
Entire Group	**79**	**100**
Bachelor's Degree		
Criminology	**56**	**71**
Non-Criminology	**23**	**29**
Years in Service		
Below 13 Years	**44**	**56**
13 Years and Above	**35**	**44**
Rank		
Patrolman to Police Staff Sergeant	**54**	**68**
Police Master Sergeant to Police Executive		
Master Sergeant	**25**	**32**

2.2 Instruments

The research instrument utilized in this study is a survey questionnaire adapted from the work of Agunos and Diaz (2019), specifically designed to assess the competencies of police investigators in the domain of fingerprinting. The questionnaire, structured into two integral sections, captures essential information critical for an in-depth analysis.

The first section focuses on gathering demographic details about the respondents, encompassing variables such as bachelor's degree, years in service, and rank. This demographic profiling enhances the contextual understanding of the diverse characteristics within the sample, providing valuable insights into potential correlations between demographic factors and fingerprinting competencies.

The second section of the survey questionnaire is intended to evaluate the competencies of police investigators in taking fingerprints and examining both knowledge and skills. Through a series of carefully crafted questions, the survey delved into the investigators' understanding of fingerprinting procedures, their proficiency in executing these techniques, and their adherence to established standards. The dual focus on knowledge and skills ensures a comprehensive assessment, enabling the identification of specific areas that may require attention or improvement. The adoption of this survey instrument aligns with the research's objective to systematically gauge the competencies of police investigators in the specialized domain of fingerprinting, providing a robust foundation for subsequent analysis and findings.

All the strands of competencies of police investigators in taking fingerprints were rated by the respondents based on a 4-point Likert scale with corresponding verbal interpretations as: Always, Sometimes, Seldom, and Never.

To attain the validity of the survey questionnaire, the instrument was submitted to the experts, for review, scheme and validation including Senior Officers in the Philippine National Police. After establishing the validity, the instrument was pilot tested to 30 police officers who are not respondents of the study and was found reliable for both knowledge (KR20=0.888) and skills (Cronbach's Alpha=0.805).

2.3 Data Gathering Procedure

After the approval of the title and reading literature and studies about the competencies of police investigators in taking fingerprints, the researcher prepared the survey questionnaires adapted from Agunos and Diaz (2019). Before using the survey questionnaire, a letter was drafted for approval from the dean of the College of Criminal Justice Education. After the approval of the letter, the researcher ran the validation of the said instrument to fit its context to the nature of respondents in the locale of the study among the three experts.

After the validation of the instrument, the criteria for selecting the respondents were set. Then, the researcher made a simple survey based on the criteria among the 41 respondents in the locale of the study to select and evaluate their qualifications for the study properly and carefully. In all

cases, before conducting the survey among the respondents, permission from the locale of the study was secured, and informed consent was given to all the respondents.

Data gathering was accomplished through a survey questionnaire among the qualified respondents. The researcher followed the rapport-building protocols as determined by the directors of the PNP institutions. Moreover, times and venues were scheduled in coordination with the PNP directors and the respondents. The retrieval of the completed survey questionnaires was undertaken thereafter.

2.4 Statistical Data Analysis

All data gathered in this study were encoded, collated, and underwent statistical analysis. Frequency count, percentage, mean, standard deviation, and One-way MANOVA were used as statistical tools. The significance level was set at 0.05 Alpha.

Frequency Count. This was utilized to determine the number of respondents as an entire group and when grouped according to bachelor's degree, years of service, and rank.

Percentage. This was used to interpret the frequencies obtained in each category of variables.

Mean. This was used to determine the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills as an entire group and when grouped according to bachelor's degree, years of service, and rank.

Table 2- Scale and its Corresponding Description

Range of Knowledge	Range of Skill	Verbal Interpretation
22.50 – 30.00	3.25 – 4.00	Excellent
15.00 – 22.49	2.50 – 3.24	Good
7.50 – 14.99	1.75 – 2.49	Fair
0.00 – 7.49	1.00 – 1.74	Poor

Standard Deviation. This was used to determine the spread of the responses in the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills as an entire group and when grouped according to bachelor's degree, years of service, and rank from the mean.

One-Way MANOVA. The One-way Multivariate Analysis of Variance (MANOVA) was used to determine the significant differences in the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills when grouped according to bachelor's degree, years of service, and rank.

3. Results and Discussions

3.1 Level of competencies of police investigators in taking fingerprints in terms of knowledge as an entire group and when classified according to bachelor's degree, years of service, and rank.

The data shows the level of competencies of police officers in taking fingerprints in terms of knowledge and skills when grouped according to bachelor's degree, years of service, and rank. Mean and standard deviation with their corresponding description were used.

In Table 3, the entire group of respondents has an excellent (M=24.99, SD=3.17) level of competencies in taking fingerprints in terms of knowledge. As to bachelor's degree, both criminology (M=24.96, SD=3.10) and non-criminology (M=25.04, SD=3.42) graduates have an excellent level of competencies in taking fingerprints in terms of knowledge. When classified as to years in service, both respondents who have been in service for below 13 years (M=24.48, SD=2.88) and 13 years and above (M=24.37, SD=3.45) have an excellent level of competencies in taking fingerprints in terms of knowledge. Lastly, when grouped as to rank, respondents from patrolman to police staff sergeant (M=25.28, SD=3.06) and respondents from police master sergeant to police executive master sergeant (M=24.36, SD=3.39) have an excellent level of competencies of the police officers in taking fingerprints in terms of knowledge.

These findings align with the statement of Tang et al. (2017), who note that in the realm of law enforcement and criminal investigation, the proficiency of police investigators in acquiring standard fingerprints is crucial for accurate identification. They must possess the domain of expertise and deep learning in a convolutional framework for orientation estimation, segmentation, enhancement, and minutiae extraction.

Table 3- Level of Competencies of Police Investigators in Taking Fingerprints in Terms of Knowledge as an Entire Group and when Classified According to Bachelor's Degree, Years of Service, And Rank.

Category	SD	M	Description
Entire Group	3.17	24.99	Excellent
Bachelor's Degree			
Criminology	3.10	24.96	Excellent
Non-Criminology	3.42	25.04	Excellent
Years in Service			
Below 13 Years	2.88	24.48	Excellent
13 Years and Above	3.45	24.37	Excellent
Rank			
Patrolman to Police Staff Sergeant	3.06	25.28	Excellent
Police Master Sergeant to Police Executive	3.39	24.36	Excellent
Master Sergeant			

Note: The description was based on the following scale. Poor (0.00-7.49), Fair (7.50 14.99), Good (15.00-22.49), and Excellent (22.50-30.00).

3.2 Level of Competencies of Police Investigators in Taking Fingerprint in Terms of Skills as an Entire Group and when Classified According to Bachelor's Degree, Years of Service, and Rank

Moreover, the entire group of police officers has a good (M=3.17, SD=0.40) level of competency in taking fingerprints in terms of skills. As to bachelor's degree, both criminology (M=3.17, SD=0.45) and non-criminology (M=3.17, SD=0.26) graduates have good level of competencies in taking fingerprint in terms of skills. When classified as to years in service, both respondents who have been in service for below 13 years (M=3.19, SD=0.46) and 13 years and above (M=3.15, SD=0.32) have good level of competencies in taking fingerprint in terms of skills. Lastly, when grouped as to rank, respondents from patrolman to police staff sergeant (M=3.11, SD=0.30) and respondents from police master sergeant to police executive master sergeant (M=3.30, SD=0.54) have good level of competencies in taking fingerprint in terms of skills.

It simply shows that the police investigators are skillful enough in taking fingerprints. Moreover, as the prevalence of technology in criminal operations increases, investigators must be adept at using and comprehending digital tools and databases. The ability to gather, evaluate, and interpret digital evidence is essential for investigators. The findings corroborate the statement of Go (2018), emphasizing the importance of thoroughly analyzing the skills of police investigators when it comes to their precise duty of collecting standard fingerprints in the field of forensic anthropology in our country, particularly on a global scale in the 21st century. Conversely, Rey and Baccay (2022) emphasized the complex process of collecting standard fingerprints in the field of forensic techniques. Skillful enough as they are, police investigators' training demonstrates their dedication to improving skills in the complex area of forensic fingerprinting (Benter & Cawi, 2021).

Table 4- Level of Competencies of Police Investigators in Taking Fingerprint in Terms of Skills as an Entire Group and when Classified According to Bachelor's Degree, Years of Service, and Rank

Category	SD	M	Description
Entire Group	0.40	3.17	Good
Bachelor's Degree			
Criminology	0.45	3.17	Good
Non-Criminology	0.26	3.17	Good
Years in Service			
Below 13 Years	0.46	3.19	Good
13 Years and Above	0.32	3.15	Good
Rank			
Patrolman to Police Staff Sergeant	0.30	3.11	Good

Police Master Sergeant to Police Executive Master Sergeant	0.54	3.30	Good

Note: The description was based on the following scale. Poor (1.00-1.49), Fair (1.50 2.49), Good (2.50-3.49), and Excellent (3.50-4.00).

3.3 Differences in the level of competencies of police officers in taking fingerprints in terms of knowledge and skills when grouped according to bachelor's degree, years of service, and rank.

The data reflects the differences in the level of competencies of police officers in taking fingerprints in terms of knowledge and skills when grouped according to bachelor's degree, years of service, and rank using the Multiple Analysis of Variance (MANOVA). All the assumptions for Multiple Analysis of Variance (MANOVA) were tested and analyzed before performing the test.

Based on Table 4, the two groups of bachelor's degree (criminology and non-criminology) do not influence the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills, $F(2, 71)=0.190$, $p=0.827$, Pillai's Trace=0.005, Partial $\eta 2 =0.005$. Also, the two groups of years in service (criminology and non-criminology) do not influence the level of competencies of the police officers in taking fingerprint in terms of knowledge and skills, $F(2, 71)=1.074$, $p=0.347$, Pillai's Trace=0.029, Partial $\eta 2 =0.029$. And the two groups of rank (patrolman to police staff sergeant and from police master sergeant to police executive master sergeant) do not influence the level of competencies of the police officers in taking fingerprints in terms of knowledge and skills, $F(2, 71)=3.003$, $p=0.056$, Pillai's Trace=0.078, Partial $\eta 2 =0.078$.

The findings support the organizational structure of law enforcement agencies, particularly the PNP. Similarly, it supports the statements of Stainton and Erwin (2022), who note that investigators must develop their fundamental understanding of the concepts of forensic science. Generally, the knowledge and skills they have enable them to navigate and decipher intricate cases effectively. On the other hand, the result of this study contradicts the findings of Earwaker et al. (2015), which indicate that practitioners were submitting a higher proportion of fingermarks that were deemed insufficient according to the criteria and were also discarding fingermarks that were of insufficient quality for analysis.

Table 5- Multivariate Test Results for the Differences in the Level of Competencies of Police Officers in Taking Fingerprint in Terms of Knowledge and Skills when Classified According to Bachelor's Degree, Years of Service, and Rank

Effect	Value	F	Hypothesis df	Error df	p-value	Partial Eta Squared
Pillai's Trace (Bachelor's Degree)	.005	.190	2.000	71.000	.827	.005
Pillai's Trace (Years in Service)	.029	1.074	2.000	71.000	.347	.029
Pillai's Trace (Rank)	.078	3.003	2.000	71.000	.056	.078

3.4 Test of Between-Subjects Effect for the Differences in Level of Competencies of Police Officers in Taking Fingerprint in Terms of Knowledge and Skills when Grouped According to Bachelor's Degree, Years of Service, and Rank

Furthermore, Table 6 suggests that the level of competencies of the police officers in taking fingerprint in terms of knowledge [$F(1,72)=0.330$, $p=0.567$, Partial $\eta 2 =0.005$], and skills [$F(1,72)=0.117$, $p=0.733$, Partial $\eta 2 =0.002$] do not differ significantly when classified as to bachelor's degree. This means that the level of competencies of the police officers in taking fingerprint in terms of knowledge and skills are comparable regardless of their bachelor's degree.

Also, the level of competencies of the police officers in taking fingerprint in terms of knowledge [$F(1,72)=0.308$, $p=0.580$, Partial $\eta 2 =0.004$], and skills [$F(1,72)=2.098$, $p=0.152$, Partial $\eta 2 =0.028$] do not differ significantly when classified as to years in service. This implies that the level of competencies of the police officers in taking 51 fingerprint in terms of knowledge and skills are comparable regardless of their years in service.

Moreover, the level of competencies of the police officers in taking fingerprint in terms of knowledge [$F(1,72)=0.688$, $p=0.409$, Partial $\eta 2 =0.009$] do not differ significantly when classified as to rank but differs significantly in terms of skills [$F(1,72)=4.506$, $p=0.037$, Partial $\eta 2 =0.059$]. This means that the level of competencies of the police officers in taking fingerprint in terms of knowledge are comparable regardless of their rank but vary in terms of skills.

The result conforms with the findings of Mustonen and Hakkarainen (2015), who showed certain difficulties in gaining skills in taking fingerprints, particularly in dealing with low-quality prints. Meanwhile, since the present result showed that police investigators' competencies vary in terms of skills, continuous development of which might be considered. Courses for personnel training demonstrate a dedication to improving skills in the complex area of forensic fingerprinting, particularly for Scene of the Crime Operatives (Benter and Cawi, 2021).

Table 6- Test of Between-Subjects Effect for the Differences in Level of Competencies of Police Officers in Taking Fingerprint in Terms of Knowledge and Skills when Grouped According to Bachelor's Degree, Years of Service, and Rank

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	p-value	Partial Eta Squared
Corrected Model	Knowledge	40.367	6	6.728	.651	.689	.051
	Skills	2.194	6	.366	2.551	.027	.175
Intercept	Knowledge	30891.860	1	30891.860	2987.043	.000	.976
	Skills	525.960	1	525.960	3669.828	.000	.976
Bachelor	Knowledge	3.412	1	3.412	.330	.567	.005
	Skills	.017	1	.017	.117	.733	.002
Years	Knowledge	3.190	1	3.190	.308	.580	.004
	Skills	.301	1	.301	2.098	.152	.028
Rank	Knowledge	7.120	1	7.120	.688	.409	.009
	Skills	.646	1	.646	4.506	.037	.059
Error	Knowledge	744.621	72	10.342			
	Skills	10.319	72	.143			
Total	Knowledge	50110.000	79				
	Skills	806.503	79				
Corrected Total	Knowledge	784.987	78				
	Skills	12.513	78				

a. R Squared = .051 (Adjusted R Squared = -.028)

b. R Squared = .175 (Adjusted R Squared = .107)

3.5 Theoretical Analysis

The findings of the study entail a lot of implications for both theory and practice. The good level of skills among police investigators in taking standard fingerprints supports the Skills Acquisition Theory (Dreyfus & Drefus, 1980), which highlights that competencies in fingerprinting are developed through a progression of skill acquisition stages, starting from novice to expert. This theory contends that practitioners must move through a series of stages, each requiring more sophisticated cognitive processing and behaviors, to become experts in fingerprinting. As they progress through each stage, more knowledge and experience are gained, allowing for the development of more complex skills. Investigators gain proficiency through practice, feedback, and experience. As reflected in the findings, police investigators in the field gained more understanding, perhaps during their baccalaureate degrees and training afforded by the PNP.

The findings reflect the purports of the Organizational Culture Theory by Schein (2010), which emphasizes first the degree of consistency of beliefs, values, assumptions, and practices among organizational members. Another emphasis is on the pervasiveness (number) of consistent beliefs, values, assumptions, and practices. Conversely, the PNP organization had been envisioned to maintain their practices consistently by submitting their men to rigorous training for them to become effective law enforcers equipped with competence in forensic science and problem-solving skills in handling crime investigations.

Furthermore, the findings of the study support the Competence Motivation Theory by Harter (1978). Police officers, in their utmost capacity, have desirable competence in taking standard fingerprints. Similarly, they possessed that internal drive within them that served as motivation to actively engage, persevere, and dedicate effort in particular achievement settings, particularly in taking standard fingerprints. Their competence became an expression of the core principle of competence motivation theory, suggesting that individuals have an inherent inclination towards activities in which they view themselves as skilled, highlighting the significant influence of perceived competence as a strong motivator. This provides a sophisticated comprehension of the dynamic relationship between motivation and competence, describing that police investigators are more inclined to actively participate and consistently invest effort when they perceive themselves as competent in forensic science.

4. Conclusion

Based on the findings of the quantitative study, the following conclusions were drawn by the researcher. Police investigators are very knowledgeable about taking standard fingerprints, but not that skilled in doing so. It can be inferred that they were able to capitalize their rigorous understanding in taking standard fingerprints. On the aspect of their skills however, there might be other standard criterion that they need to be harnessed, or in some instances, this might be due to low quality fingerprints that they handled. Police investigators have comparable levels of knowledge about taking fingerprints, regardless of their bachelor's degree, years of service, and rank. However, police investigators who are already Police Master Sergeants or Police Executive Master Sergeants have better skills in taking standard fingerprints compared to police officers who are Patrolmen or Police Staff Sergeants. It can be inferred that both police officers have received rigorous knowledge about taking standard fingerprints. Perhaps those who are senior in rank might have sufficient exposure to and practice taking standard fingerprints. Based on the result of the study, the proposed training design can help police investigators to be more skillful in taking standard fingerprints.

Acknowledgements

The researcher extends profound gratitude to the thesis adviser, panelists, validators, and statistician whose expertise, guidance, and constructive feedback greatly contributed to the success of this study. Sincere appreciation is also given to the police authorities, local investigators, academic mentors, and the St. Anthony's College community for their support, cooperation, and assistance throughout the research process. Above all, the researcher offers deepest thanks to family, friends, and the Almighty God for their unwavering love, encouragement, and blessings that sustained the completion of this endeavour.

References

Agunos, J. & Diaz, R. (2019). Investigation and detective competencies of the Philippine National police in the Province of Bataan: Basis for professional development plan. *International Journal in Management and Social Science, 07*(05). ISSN: 2321-1784.

Benter, J. B., & Cawi, R. D. (2021). The State of the Art of the Philippine National Police Crime Laboratory Services. Available at *SSRN 3826806*.

Copper, D. R. (2006). *Business Research Method. (9th edition).* USA: McGraw Hill.

Earwaker, H., Morgan, R. M., Harris, A. J., & Hall, L. J. (2015). Fingermark submission decision-making within a UK fingerprint laboratory: Do experts get the marks that they need?. *Science & Justice*, *55*(4), 239-247.

Edmond, G., White, D., Towler, A., San Roque, M., & Kemp, R. (2021). Facial recognition and image comparison evidence: Identification by investigators, familiars, experts, super-recognisers and algorithms. *Melb. UL Rev.*, *45*, 99.

Fakiha, B. S. (2020). How technology has improved forensic fingerprint identification to solve crimes. *International Journal of Advanced Science and Technology*, *29*(5), 746-752.

Fingerprint Identification Society of the Philippines, Inc. (2013). Fingerprint Newsletter. https://fisphil.weebly.com/uploads/1/1/0/7/11075973/fingerprint_newsletter.pdf.

Go, M. C. (2018). Appraising forensic anthropology in the Philippines: Current status and future directions. *Forensic Science International*, *288*, 329-e1.

Harter, S. (1978). Effectance motivation reconsidered. Toward a developmental model. *Human development*, *21*(1), 34-64.

McCombes, S. (2019). Descriptive research design| definition. *Methods and Examples*.

Mustonen, V., & Hakkarainen, K. (2015). Tracing two apprentices' trajectories toward adaptive professional expertise in fingerprint examination. *Vocations and Learning*, *8*(2), 185-211.

Prislan, K., & Slak, B. (2018). Analysis of the relationship between smart cities, policing and criminal investigation. *Varstvoslovje*, *20*(4), 389-413.

Rey, W. P., & Baccay, M. A. (2022, February). MAFIS Overlay Network: Towards a Secure Network for Mobile Automated Fingerprint Identification System over Virtual Private Network (VPN). In *Proceedings of the 10th International Conference on Communications and Broadband Networking* (pp. 20-27).

Richman, D. C., & Seo, S. (2022). How federalism built the FBI, sustained local police, and left out the states. *Stan. JCR & CL*, *17*, 421.

Schein, E. H. (2010). *Organizational culture and leadership* (Vol. 2). John Wiley & Sons.

Mishra, N. K. (2022). Fingerprint Science: A Review on Historical And Contemporary Forensic Perspectives.

Shuttleworth, M. (2008). *Descriptive Research Design*. Retrieved May 07, 2024, from Explorable.com: https://explorable.com/descriptive-research-design.

Stainton, I., & Ewin, R. (2022). In Blockley T. (Ed.). *Criminal investigation*. (1st ed.). St Albans: Critical Publishing. Retrieved from https://www.proquest.com/books/criminal investigation/docview/2673442793/se-2.

Dreyfus, H. L., & Drefus, S. E. (1980). *Proficient adaptable response to emergencies caused by identifiable malfunctions: Contrasting training implications of two proposed models* (No. ORC803).

Tang, Y., Gao, F., Feng, J., & Liu, Y. (2017, October). FingerNet: An unified deep network for fingerprint minutiae extraction. In *2017 IEEE International Joint Conference on Biometrics (IJCB)* (pp. 108-116). IEEE.