



**The Demand and Supply of ICT Skills in the Safety and
Security Sector: *SASSETA's Perspective***

Final Report

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Safety and Security Sector Education and Training Authority (SASSETA)
Building 2 Waterfall Corporate Campus
74 Waterfall Drive
Waterfall Drive
Midrand
2090

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Executive Summary

This study intends to explore and, to conduct qualitative and quantitative analysis research to understand the demand and supply of ICT skills in the safety and security sector in South Africa in the context of the fourth (4IR) industrial revolutions. Industrial revolutions occur when new technologies and world views introduce significant shifts in economic systems and social structures (Schwab, 2016). The current reality is that technological advancement is increasingly transforming the way we work, live, communicate, travel and socialise, which, at the rate, it is going, could fundamentally alter life, as we know it.

So profound could it be that renowned futurist Ray Kurzweill predicts a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed (Frey Osborne & Holmes). In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before, and humankind now finds itself at the genesis of a revolution considers to be the Fourth Industrial Revolution (4IR) (Mason, 2015).

The term 'Fourth Industrial Revolution', also known as Industry 4.0, has its roots in Germany's federal government 2011 high-tech strategy, and commentators believe that Industry 4.0 will leverage the internet, digital technologies and quantum sciences to drive further into autonomous, intelligent cyber-physical systems (Schwab, 2016).

The report consists of five sections as follows:

- i. The context – this gave an overview of the Supply of ICT and technical skills from the world's perspective narrowing down to South Africa.
- ii. Literature review – this section gave a background to the ICT and technical skill supply and captured demand as well through past and current thinking. The section paved way for the methodology and also substantiated the central problem.
- iii. Methodology – the methodology section describes the data collection tool (principally the research questionnaire) and its administration. Also, the data analysis procedure was outlined. The study deployed a qualitative research approach as detailed in part three of this report. However quantitative sources of data were also used to support the findings of the study.
- iv. Presentation of results – the results were presented with study finding a positive impact of the partnerships between SASSETA and sector training institutions on the supply of ICT skills in South Africa. Possible ways of strengthening these partnerships were also outlined.
- v. Conclusion and recommendations – the study was concluded in this section and recommendations were given which indicated that SASSETA need to be involved more in the partnerships.

Table of Contents

Part One:	1
Contextualisation.....	1
1.0 The dynamics in the demand and supply of ICT and technical skills.....	1
1.1 The position of SASSETA in the supply of ICT and technical skills	4
Section Two:	7
Literature Review	7
2.1 Introduction.....	7
2.2 Background to Sector training Institutions.....	7
2.2.1 The Safety and Security Sector Education and Training Authority (SASSETA)	9
2.2.2 SETA for Safety and Security activities and their commitment since 2005	10
2.2.3 Input from the Local Government SETA.....	10
2.3 Theoretical Literature Review	11
2.3.1 Theories on the need for Security Services in a country.....	11
2.3.2 Theories on technology use	12
2.3.3 Unified Theory of Acceptance and Use of Technology (UTAUT)	13
2.4 Empirical Literature Review	13
2.4.1 South Africa Police Services (SAPS) and ICT	13
2.4.2 ICT in Metro police and traffic management.....	13
2.4.3 ICT in prisons.....	14
2.4.4 South African Security Services and ICT.....	15
iii. Deploy Cognitive Security	15
2.5 Conclusion.....	16
Part Three:	18
Methodology And Approach	18
3.1 Introduction.....	18
3.2 Research design.....	18
3.3 Target Population, Sampling Techniques and Sample Size.....	19
3.4 Data Collection and Research Instrument.....	19
3.5 Information and data analysis	20
3.6 Limitations	20
Part Four:.....	21
Findings	21
4.0 Introduction.....	21
4.1 Findings.....	21
4.1.1 The nature of the partnership between sector training institutions and SASSETA21	
4.1.2 The demand of ICT and technical skills	21
4.1.2 Skills targeted by the partnerships	21
4.1.3 The outcomes of the partnerships	21
4.1.4 Possible ways of strengthening partnerships with SASSETA	24
Part five:.....	26
Conclusions and Recommendations.....	26
5.0 Introductions.....	26
5.1 Conclusions.....	26
5.2 Key recommendations	27
5.3 Closing remarks.....	28
References	30

List of Figures

Figure 1.1: Individuals with no experience with computer use, 2012 weighted percentage of all individuals	2
Figure 1.2: Enterprises that reported hard-to-fill vacancies for ICT specialists, 2012 and 2014; As a percentage of all enterprises and of those looking for an ICT specialist	4
Figure 4.1: Indication of whether the partnership was a success or not.....	22
Figure 4.2: Skills acquired under SASSETA's skills development programme	23
Figure 4.3: Improvement in the supply of ICT and technical skills (responses).....	23

List of Tables

Table 1.1: Top 20 CIS intensive occupation across countries, 2012.....	3
Table 2.1 : Strata and sample size	19
Table 3.1: The impact of the partnership between the training institutions and SASSETA in the supply of ICT and technical skills	24
Table 4.2: Possible ways of strengthening partnerships with SASSETA	24

1.0 The dynamics in the demand and supply of ICT and technical skills

Skills mismatch can be perceived as a result of labour market and training market imperfection. Changes in supply and demand can cause mismatch as information about these changes does not reach the relevant people soon enough to adjust decisions and behaviour.

Changes in the demand for labour include both changes in numbers of jobs available in the labour market (quantitative changes) and the structure of skills needed to perform a job (qualitative changes). In the current globalised and rapidly changing economy there are multiple determinants of labour demand:

- a) The business cycle, which influences total demand for labour but also influences sectors to different levels and so has an effect on the structure of the economy;
- b) Global trade, internalisation of the market and international division of labour;
- c) Changes in domestic consumption as a result of growing population income (focus on quality products) or other changes in consumption behaviour (changing age structure of population, demand for healthy products);
- d) Focus on some sectors as a result of international agreements (e.g. on renewable energy as a result of environment protection agreements);
- e) Technological development and innovations which change the nature of jobs.

ICT specialists have been among the most dynamic occupations in recent years. The top 10 growing occupations in the EU26 between 2012 and 2013Q2 include 'Software Technology Developers and Analysts' or 'ICT operators and user support technicians' with a rise of 156 300 to 64 500 workers in each case (European Commission, 2014a). According to the Australian Government, the jobs of ICT managers soared by 29.7% between 2009 and 2013. The IT industry lost just 1% of its labour force in the United States in a contraction, with a 7.5% rise over pre-recession rate in 2009 to 2011 (BLS 2013).

Several forecasts suggest that the demand for ICT professionals will grow even faster over the next years whilst the supply is still constrained. According to BLS projections (Lacey and Wright, 2009), "Computer and mathematical occupations" in the United States "are expected to grow, as a group, more than twice as fast as the average for all occupations" in the United States. The Australian Workforce and Productivity Agency estimates that job openings for ICT occupations in Australia will reach 1.18 million in 2025, and that the increase is expected to be driven by new growth instead of replacement demand.

A study commissioned by the Norwegian Ministry of Local Government and Modernisation predicts a shortage of ICT personnel by about 10,500 persons in Norway by 2030 (OECD, 2014a). The European Commission (2014b) forecasts the gap between demand and supply of ICT professionals in the EU27 to grow on average by 16.39% a year from 2013 to 2020.

The above mentioned forecasts rely on a scenario-based approach which, by its very nature, is hard to validate. Yet, they raise some concerns about the ability of the labour market to

provide an adequate supply of workers with the required skills. Indeed, a shortage of ICT and other technical specialists would require that countries adopt policies to develop these skills among workers as well as among new entrants in the labour market.

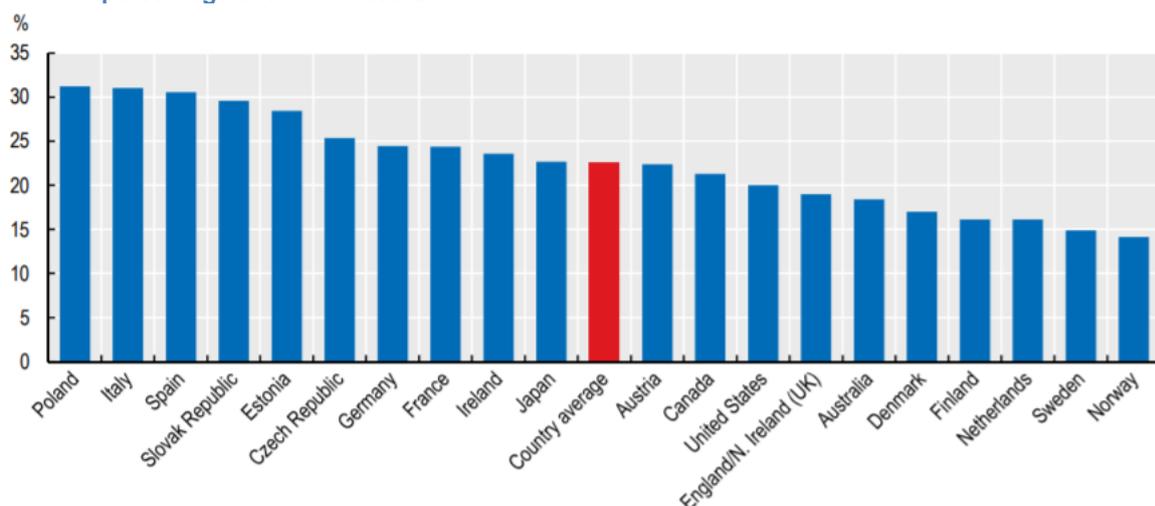
The use of ICTs raises demand for new capabilities on three fronts: ICT expertise in the programming, applications creation and management and ICT complementary competency to execute new occupations associated with the use of ICTs on the workplace, that is connect on social networks and brand goods on e-commerce websites or interpret big data ICT generic competencies for technical purposes Vincenzo *et al.*, (2016).

The OECD Programme for the International Assessment of Adult Competencies (PIAAC) background questionnaire collects a range of information on the ICT use at work by asking how often the respondents:

- send/receive email
- find work-related information on the Internet
- conduct transactions on the Internet
- use spreadsheets
- use word processors
- use programming languages or
- have real-time discussions

In the (PIAAC) survey, the questions about ICT use at work were only asked to people who report “having experience with computer in job”. As people with no experience with computer have not been included, the answers to these questions tend to overrate the frequency of ICT use at work. In addition, as the distribution of those with no computer experience across occupations is unknown, the bias is not uniform: frequencies of ICT use may be overrated in some occupations and underrated in others.

Figure 1.0.1: Individuals with no experience with computer use, 2012 weighted percentage of all individuals



Source: OECD, based on PIAAC Database, June 2015.

Figure 1.1 shows that the countries were different in terms of the ICT skills use at work. However the figure indicated that there was bias. This bias is likely to be large. Almost a quarter (24.5%) of all (weighted) PIAAC respondents reported no computer experience at

work while a very small percentage of individuals (0.07%) refused to answer or answered “do not know”. The bias is larger in Poland, Italy and Spain while smaller in the Netherlands, Sweden and Norway. In order to correct for such a bias, the frequency of ICT use at work has been computed not as a percentage of the respondents to the ICT questions but as a percentage of all individuals.

Table 1.1 below shows the top 20 Communication and Information Search (CIS)-intensive occupations across countries. Interestingly, 15 out of them (shown in italics) are not ICT specialist occupations. They include Administrators and Managers (ISCO-08 242, 121, 112 and 134); Sales and Business agents (122, 243); Mathematicians, actuaries and statisticians, Finance professionals and Associated professionals (212, 241 and 331); Scientists and Engineers (211 and 214) as well as University and higher education teachers (231), Legal professionals (261), Librarians, archivists and curators (262) and Legislators and senior officials (111).

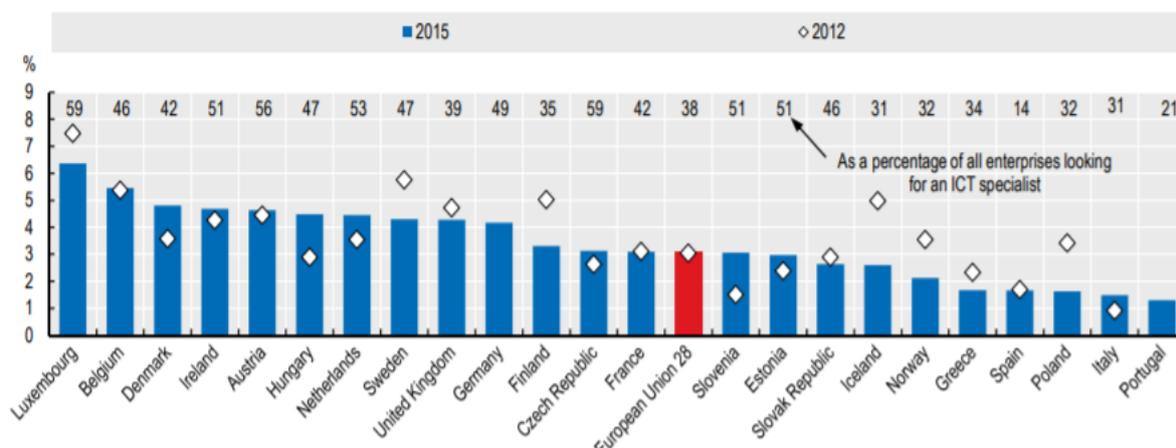
Table 1.1: Top 20 CIS intensive occupation across countries, 2012

Proportion of countries where the occupation is among the top 20 CIS			
Rank	Occupation	ISCO-08	Frequency
1	Information and communications technology service managers	133	94%
2	<i>Finance professionals</i>	241	94%
3	<i>Sales, marketing and development managers</i>	122	89%
4	Database and network professionals	252	89%
5	<i>Business services and administration managers</i>	121	78%
6	<i>Administration professionals</i>	242	78%
7	Software and applications developers and analysts	251	72%
8	<i>Legislators and senior officials</i>	111	67%
9	Electrotechnology engineers	215	67%
10	<i>Sales, marketing and public relations professionals</i>	243	67%
11	<i>Physical and earth science professionals</i>	211	61%
12	<i>Mathematicians, actuaries and statisticians</i>	212	61%
13	<i>Engineering professionals (excluding electrotechnology)</i>	214	61%
14	<i>Legal professionals</i>	261	61%
15	Information and communications technology operations and user support technicians	351	61%
16	<i>Librarians, archivists and curators</i>	262	56%
17	<i>University and higher education teachers</i>	231	50%
18	<i>Managing directors and chief executives</i>	112	44%
19	<i>Professional services managers</i>	134	44%
20	<i>Financial and mathematical associate professionals</i>	331	44%

Source: OECD, based on PIAAC Database, October 2015.

Employer surveys provide complementary information about potential skills shortages. In the European Union, 38% of enterprises looking for an ICT specialist reported having difficulties filling the vacancies (Figure 1.2). However, the percentage of enterprises reporting hard-to-fill vacancies for ICT specialists is much smaller – about 3% - and has not changed from 2012 to 2014. This share decreased or remained stable in most EU countries. The most significant increase (above 1 percentage point) was observed in Denmark, Hungary and Slovenia. In most countries, therefore, the potential shortage of ICT skills is small because only a small share of enterprises are looking for ICT specialists.

Figure 10.2: Enterprises that reported hard-to-fill vacancies for ICT specialists, 2012 and 2014;
As a percentage of all enterprises and of those looking for an ICT specialist



Source: OECD, based on Eurostat Information Society Statistics, October 2015.

Acquiring suitable ICT skills globally and in South Africa has become a difficult task. Industry has indicated that graduates require a diverse set of skills. Computer Science, Information Systems and Information Technology generally utilise the IS2010 and CS2013 ACM/IEEE curricula. ICT personnel are ranked in the top 10 biggest employee shortages presently, as indicated in the latest Talent Shortage Survey 2013 from the Manpower Group South Africa (Manpower Group South Africa, 2014).

The businesses (72%) indicated that the impact of not filling the positions had a medium to high impact on their business success and would reduce their ability to serve clients as well as impact their competitiveness and productivity. The survey highlighted the importance of soft skills and specifically that businesses should partner with educational institutions to create curricula aligned to their talent needs. The decline in the number of people with the required ICT skill sets over the past years and the limited number of people choosing and enrolling for ICT careers is of major concern (Cohen, 2012). The ICT skills shortages have been predicted over the past two decades and the ICT sector is experiencing a global ICT skills shortage.

The nation South Africa, like the rest of the world is facing ICT and technical skill in the different sectors of the economy including the safety and security sector. The training institutions have not been able to provide the skills that meet the demand of those skills thus supply is lower than demand.

It is part of the National Development Plan (NDP) towards achieving the vision 2030 that ICT and technical skills. Therefore, in support and as part of the current strategic plan, SASSETA is carrying out this study to examine the impact of partnering with the sector training institutions in the supply of ICT and technical skills.

1.1 The position of SASSETA in the supply of ICT and technical skills

As aforementioned, ICT personnel are ranked in the top 10 biggest employee shortages presently, as indicated in the latest Talent Shortage Survey 2013 from the Manpower Group South Africa (Manpower Group South Africa, 2014). The decline in the number of people with the required ICT skill sets over the past years and the limited number of people

choosing and enrolling for ICT careers is of major concern. The ICT skills shortages have been predicted over the past two decades and the ICT sector is experiencing a global ICT skills shortage. Various initiatives have been initiated to deal with the problem (Cohen, 2012).

According to a survey by the ISETT SETA (Sector Education and Training Authority) in South Africa, there were 4,671 ICT occupation vacancies in 2007. The National Master Scarce Skills list issued in 2008 by The National Department of Labour indicated that the ICT sector required a minimum of 37,565 ICT professionals. The figures of more recent studies indicated that the more realistic figure is as high as 70,000 ICT vacancies.

The forecast in South Africa presently indicates a continued demand for ICT skills that would exceed the supply by more than 20% (DoL, 2007). Businesses continually struggle to find qualified and suitably skilled ICT personnel. Businesses employ ICT personnel with the relevant ICT skills recruiting mainly students from tertiary and ICT training institutions.

Currently, businesses require ICT personnel with extensive ICT skills sets and find it difficult to recruit suitably qualified ICT graduates with the required technological as well as related business skills. The national and international ICT skills shortage, combined with the lower number of ICT graduates graduating from tertiary institutions annually, makes it difficult for businesses to recruit suitably qualified graduates who can immediately make an impact on business process improvement. Research conducted in South Africa on the ICT Graduate skills requirements indicated that the ICT skills taught at tertiary level do not sufficiently prepare students for the requirements of their roles in employment.

In South Africa, one aspect of the ICT skills debate currently focuses on the misalignment between ICT graduate skills requirements by industry and the graduate ICT skills competencies provided by tertiary and training institutions (Harris, 2011). The key criticism of university graduates entering the job market is that they lack key skills required by business. The reports indicate a “disconnect between academia and business” and that graduates entering the job market are lacking key skills required by business including technical skills.

It is therefore the role of SASSETA to ensure the required skills are met through facilitating training through different ways and the efforts so far have not yet achieved the required results. The ISETT SETA (Sector Education and Training Authority) survey indicated that there were 4,671 ICT occupation vacancies in 2007. The vacancies included positions such as Network and Systems Engineers, Business Analysts and Software developers.

The vacancies predicted for 2010 included positions such as Project Managers, ERP consultants and Mobile developers (ISETT SETA, 2007). The current positions where major shortages are currently being experienced include Business Analysts, Software Developers and Testing and Quality Assurance Specialists (CJI, 2012). Currently SASSETA is aiming to fill the skills gaps identified since long before and different challenges are experienced but it is expected that the continuous efforts will solve the challenge of skills shortage.

To indicate the efforts of SETAs, trends in the enrolment in learnership programmes have improved over the past years. In the Sector Education and Training Authorities (SETAs), the total number of learnership registrations increased by 105.7% from 49 309 in 2010 to 101 447 in 2016. The participants in learnerships programmes were both workers and the unemployed and higher proportions of learnerships were awarded to the unemployed. The

number of skills programme registrations recorded a 105.8% increase from 63 659 in 2010 to 131 017 in 2016, and the majority participants were workers. SASSETA is in a position to assist in the supply of skills in shortage by providing accreditation to any institution that meet the requirements to train people.

Also, SASSETA has introduced partnerships with sector training institutions and some have achieved the intended objectives, but some have failed. More partnerships have been proposed for the year 2020-2021 and are expected to fill the skills gaps including the ICT and technical skills.

With reference to the safety and security sector, anecdotal evidence suggests that this sector may be hugely impacted by the disruptive technologies of the 4IR. The study on *Robotic Wars* by Levengrahams (2015) is a case in point. Indeed, studies are ongoing with respect to possible influences of the 4IR on public safety, cyber-security, intel activities and as well on military operations and defence doctrine.

Section Two: Literature Review

2.1 Introduction

Sector training institutions have played a big role in the transformation of communities from traditional and inefficient ways of operation in South Africa and the world at large (Fanibuyan, 2019). This has been enabled by the services that these sector training institutions are putting on the use of Information and Communication Technologies (ICT) in all sectors of the country together with technical skills that are taught in these sectors.

The use of both theoretical and empirical literature is of paramount importance in getting into detail as it helps the country in finding out their real influence on the community. The existing theories on the subject matter shed light on the evolution of these institutions while empirical evidence show their real influence in changing the communities. The empirical literature covers studies done in South Africa and the rest of the study, with which the results of the studies inform appropriate policy formulation and implementation.

This review has key research objectives that it seeks to address. These objectives are:

- i. To examine the impact of partnering with sector training institutions on the supply of ICT and technical skills.
- ii. To assess the ways of strengthening partnerships with sector training institution.
- iii. To find out whether sector training institutions are capable to produce the required ICT and technical skills.

The empirical literature reviewed together with the findings of this paper helps in achieving the objectives of this paper. The evidence from other studies guides in the way sector institutions conducts their training for their services impacts the sectors of the country in a big way. The current review focuses on the Safety and Security Sector Education and Training Authority (SASSETA) which is a sector training institution that specializes in training of the South African security forces.

The review looks at how the partnership of the security forces with SASSETA comes with effective ICT in the department and technical skills that improves the South African security forces. The general goal of this review is to find out the importance of ICT and technical skills that comes from these sector training institutions in making these sectors efficient in their operations.

2.2 Background to Sector training Institutions

Sector training institutions are found in almost every country for they serve the same purpose of developing the country through additional training they give to different sectors of the economy. In South Africa they are known as Sector Education and Training Authorities (SETAs). These organizations were established by the Minister of Labour, Membathisi Mdladlana, on 3 March 2005.

They are concerned with education and training of different sectors and their job is to help implement the National Skills Development Strategy and to increase the skills of people in their sectors. The SETAs have replaced the 33 Industry Training Boards but have greater

powers and responsibilities. They cover every industry and occupation whereas the Industry Training Boards covered some sectors only and focused mainly on apprenticeships. SETAs are concerned with, the internships, learning programme type matrix and unit based skills programme.

There are millions of people who need to learn new skills. Some are already in jobs who need to improve their skills and to learn new ones. Each year there are thousands of young people who finish their education and are looking for jobs. More than 50% of Grade 12 learners in South Africa leave school without basic skills to seek work. They need skills and training. There are nearly 4.3 million people who are unemployed.

Most of them have few skills and little training. There is an estimated figure of between 6,000 and 7,000 unemployed graduates. There are those who want to run their own businesses; people with disabilities, and those whose current skills provide them with barely enough money to survive. All need and can benefit from skills development. SETAs have been established to manage the many skills development needs. Each SETA coordinates skills development in its sector.

For the purposes of planning and managing the delivery of training, the economy has been divided into 23 sectors, each of which has its own SETA. A sector is made up of economic activities that are linked and related. For example, there is a SETA that deals with the banking sector; another is concerned with skills development in the information technology sector; another is responsible for the manufacturing sector and there is a SETA for agriculture. The SETAs cover both the public and private sectors.

The SETA is also committed to the National Skills Development Strategy (NSDS) III Goal 4.1 which focuses on *“Establishing a credible institutional mechanism for skills planning”* and its related outputs. Additionally, SASSETA is steadfast about Output 4.1.1.2 of the NSDS III which states that “Sector skills plans are professionally researched; provide a sound analysis of the sector and articulate an agreed sector strategy to address skills needs” (NSDS III, 2011). Central to the objective of the NSDP is to promote a skills development system that effectively responds to the needs of the labour market, particular to the needs of the safety and security industry.

Therefore, research is a key pillar to the advancement of the NSDS III targets, objectives, and commitments. Therefore, it is key to SASSETA’s Research Department to play a significant role in the production of accurate and information to be used for planning, implementation, and evaluation of SASSETA’s skills development initiatives for the assist the whole country at large since safety and security is key to all economies during this pandemic.

The National Skills Development Plan (NSDP) as a policy document envisions of South Africa, an educated, skilled and a capable workforce. The NSDP’s quest is to support economic growth, employment creation and social development through improving access to occupations in high demand and priority skills aligned to economic enhancement. It therefore calls for the services of SASSETA as it helps in skills development of staff which helps to achieve development of the economy.

In addition, the NSDP seeks to achieve an adequate and appropriate skilled workforce that is critical for and responsive to the economic needs. Furthermore, the NSDP details the

outcome, which as the SETA must contribute towards achieving them. In a nutshell, the aim of the NSDP is to promote and advance the goals of the National Development Plan (NDP) through skills development.

In addition to the NSDS III and the current National Skills Development Plan (2030), the White Paper for Post-School Education and Training points out that investigation more or researching on the importance of these SETAs like SASSETA is important. It is through education of the staff members that makes sectors develops. The services of SASSETA are critical in the education of the security force members.

Research on the impact of SASSETA in ICT and technical skills development of the workforce helps in coming up with the policies that support SASSETA and identification of areas that need improvement in the process. Therefore, research should be at a center of building a focus and responsive post-schooling system.

The White Paper for Post-School Education and Training also supports that sectors should partner with higher education institutions (HEI) and industry so that research among sectors is established in highlighting the efforts put by every player in the sector. It is argued that research will support skills priority actions as identified in the SSP. These are:

- Partnership with sector training institutions and academies;
- Transformation and professionalization of the sector;
- Information communication and technology (ICT) skills;
- Technical and specialized skills; and
- Building an active citizenry (DHET, 2019).

2.2.1 The Safety and Security Sector Education and Training Authority (SASSETA)

SASSETA is a SETA that has been set up to facilitate education and training specifically to the wide range of safety and security providers and services in South Africa ((Lesia, 2020). These range from the military and police to the diplomatic arena. While it has been in existence in several forms since SETAs were first introduced in 2000, when the new South African SETA landscape makes its appearance in March 2011, there were several changes to the SASSETA.

Even though it was formed in July 2005, it has changed yet again and has several new responsibilities. The original SASSETA was established on July 1, 2005 a little more than five years after South Africa's first SETAs were launched. This new SETA amalgamated two of the initial SETAs:

1. the Police, Private Security, Legal, Correctional Services and Justice Sector Educational and Training Authority, the POSLEC SETA, and
2. The Diplomacy, Intelligence, Defense and Trade Education and Training Authority, the DIDTETA.

Both the POSLEC SETA and DIDTETA had been established on March 20, 2000 in terms of the Skills Development Act that was promulgated by the South African Parliament in 1998. This means that the functions of both these SETAs was broadly to develop and improve the skills of the South African workforce in ways defined in the new (1998) legislation. SETAs were given basic guidance of how to do this and they were required to work out and

implement achievable sector skills plans, promote effective learnerships and provide employers, trainers, and workers with the necessary funds in terms of the legislation.

2.2.2 SETA for Safety and Security activities and their commitment since 2005

According to the SASSETA publications, when SASSETA was formed in 2005, its new board defined a strategy for the new organization. This was done at a strategic planning workshop in August 2005 that aimed to create and launch a definitive corporate strategy for the new SASSETA. Since then, SASSETA committed itself to five primary objectives that relate to the South African Government's National Skills Development Strategy (NSDS):

- i. To develop a culture of top quality learning that would last a lifetime for any learner.
- ii. To foster skills development in the formal sector of SASSETA for both productivity and the growth of employment potential and possibilities.
- iii. To stimulate and support the development of skills in small business in South Africa.
- iv. To promote skills development that would make more people employable and enable them to have sustainable livelihoods via a variety of social development initiatives.
- v. To assist new entrants to the industry (or sector) find employment.

2.2.3 Input from the Local Government SETA

When the Local Government SETA (LGSETA) was first established in 2000, it focused on several different areas including infrastructure and service delivery, financial viability, community-based participation and planning, management and leadership and adult based education and training (ABET). Within this realm of operation, traffic law enforcement and metro policing were also the responsibility of the LGSETA. This has now been transferred to the SASSETA, which does seem more logical.

It stands to reason then that the needs of those entering the SASSETA sector or furthering their experience within the sector are hugely varied and all these factors should be considered. For example, some of the employment opportunities within this sector require learners to take college courses, while other possibilities allow them to get away with a short course of some sort simply to make an entrance into the industry. Somebody wanting to rise in the ranks of management might want to take a management course. Other learners may want a workplace experience before they decide whether this sector is even the right one for them.

There are professionals in the SASSETA who can offer excellent advice. They will also be able to tell you whether there are bursaries, internships, apprenticeships, or discretionary grants available in various sub-sectors that you or family members might apply for. The Safety and Security SETA is in Midrand, north of Johannesburg in Gauteng. It covers the following departments in the security sector; Legal activities, Investigation and security activities, Policing, Correctional services, Justice, Department of Defense, NIA – National Intelligence Agency, SASS-South African Secret Services, Metro police, Traffic management or law enforcement.

2.3 Theoretical Literature Review

2.3.1 Theories on the need for Security Services in a country

There are quite several theories that try to explain the need for security in any country or society. The theory of security by Ron Kurtus revised in 2012, outlined that security is the protection of a person, property, or organization from attack. According to Kurtus, The theory of security is to know the types of possible attacks, to be aware of the motivations for attacks and your relationship to those motives. These are key in the safety and security concerns of any society.

According to Mason (2015), the security or defense against such a threat is to make it difficult to attack, threaten counter-measures, or make a pre-emptive attack on a source of threat which forms the department of security in any economy so that they are responsible in making sure that the society of community is safe.

It is therefore important that the department responsible for the security of the people are well equipped with the right skills so that the country is a safe and secure place. In this case, the SETA responsible for training and educating the security forces should ensure that their sector has the right skills to perform their tasks effectively. According to the theory questions that the society requires to ask includes:

- What type of possible attacks require security?
- What should you do about these threats?
- What type of defenses can you have?

These questions help in identifying the persons responsible for providing security and whether they have the right training. SASSETA plays a big role in all this.

Nowadays, security does not only pertain to physical security, but also to information security. Most security companies play a role in ensuring that people's information is protected. Safety and security education and training also help the work forces to be able to deal with information security of the organisations they work with. Information security pertains to almost every organisations in the safety and security department be it in prisons, judiciary, police or security companies.

In today's global and competitive business environment, organizations are becoming increasingly dependent on information and dissemination of the information. Such being the case, the use of computer-based information systems as well as globally scattered computer networks is of great importance to meet these requirements.

On the other hand, this dependency makes organizations' information systems progressively more vulnerable to outside attacks and/or internal security breaches which may cause financial losses and disruption of the business activities (Stanton, 2017). This call for the services of SASSETA in ensuring that these security forces are equipped with the right skills that enable them to protect information of organisations they work with to avoid financial losses or disruption of the organisations.

To better comprehend the significance of the problems of information threat, it is beneficial to take a look at the findings of the recent study conducted by Computer Security Institute. According to this study (CSI Survey, 2007), 46% of the 487 survey respondents reported

that their organization was exposed to at least one security incident in the past 12 months. Another very significant statistic shows that organizations' total financial losses due to computer security incidents are approximately \$66,930,950 in 2007 (based on the responses from managers of 194 companies).

More interestingly, 27% of the respondents also reported that up to 20% of the cyber losses is caused by the people inside the organization, while this proportion is 37% for the cyber losses greater than 20% (Kimmet, 2016). Considering the findings, as mentioned above, it is obvious to conclude that proper management of information systems security is vital and inevitable. In addition to this very fact, it is also of great importance for academic environments to attach more importance to the information security related issues in organizations.

How academic environments approached these issues are summarized in a review paper on Information Security Research (Queen, 2019). This study reports that there are 1280 security related papers published in 3 IS Security journals and 20 IS journals between 1990-2004. Out of these papers, only 18.51% include a theory as a framework the study.

Since the application of the theories and appropriate research methods are essential for any research study, it is our belief that academic researchers should attach more importance on the creation, adoption, and/or application of the theories from the literature (Queen, 2019). Stanton and Weiss (2008) also offer a model to suggest solutions and guidelines to fill the information security research gaps by using social theories, various aspects of which deal with both human and technical issues from the perspective of those involved in the system of concern.

2.3.2 Theories on technology use: Technology Acceptance Model (TAM)

The most cited theory of technology use in literature is the Technology Acceptance Model (TAM). Davis (2018) presented a theoretical model aiming to predict and explain ICT usage behavior, that is, what causes potential adopters to accept or reject the use of information technology. Theoretically, TAM is based on the Theory of Reasoned Action (TRA). In TAM, two theoretical constructs, perceived usefulness, and perceived ease of use, are the fundamental determinants of system use, and 15 predict attitudes toward the use of the system, that is, the user's willingness to use the system.

Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance his or her job performance, and perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort (Davis, 2018, 320). In these articles TAM was used in three different ways, to compare different adoption models, develop extensions of TAM, or replicate the model.

For example, Davis et al. (2018) empirically compared the ability of TRA and TAM to predict and explain the acceptance and rejection by users of the voluntary usage of computer-based technology; Venkatesh and Davis (2017) developed and tested a theoretical extension of TAM, referred to as TAM2, which explains perceived usefulness and usage intentions with the help of social influence and cognitive instrumental processes, and Adams et al. (2015) replicated Davis' (2018) study.

2.3.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology is also one of the most cited theories of technology use. Venkatesh et al. (2016) developed the unified model through reviewing eight models 17 which explain ICT usage, namely TRA, TAM, the motivational model, TPB, a model combining TAM and TPB, the model of PC utilization, DOI, and the social cognitive theory.

The purpose of UTAUT is to explain a user's intentions to use ICT and the subsequent user behavior. The model considers four constructs as direct determinants of user acceptance and usage behavior, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. There are four key moderating variables: gender, age, experience, and voluntariness of use.

The authors stated that UTAUT provides a tool for managers to assess the likelihood of success of technology introductions and to understand the drivers of acceptance in order to design interventions, which include for example, training or marketing. UTAUT focuses on users who may be less willing to adopt and use new systems.

2.4 Empirical Literature Review

2.4.1 South Africa Police Services (SAPS) and ICT

Albertus (2018) conducted a study on Translating a Digital Strategy for South Africa's Police Services. The study argued that South Africa ranks amongst the most dangerous countries in the world due to the rise in violent crime and an ineffective government to put measures in place to deal with corruption and an underfunded South African Police Service (SAPS). The failure of police to respond effectively to crime stems from underfunding and a shortage of trained police officials with suitable competencies to manage the crime pandemic. This calls for SASSETA to intervene in ensuring the SAPS receives the best ICT and training that makes them to be able to curb crime.

Also, it is a critical responsibility for the Minister to ensure that they strengthen their relationship with SASSETA as the training institutions that provides ICT training to make the police a better team to work with. According to Seedat, et. al, (2019), South Africa is not a country at war, yet it faces an unprecedented burden of morbidity and mortality arising from violent crime and injury. Advancement in Information and Communication Technology (ICT) has the potential to assist with controlling crime and gain efficiency in policing efforts to serve communities (Nuth, 2018).

ICT has led to more effective policing and therefore is an essential infrastructure for modern policing. It has become a gateway and an enormous playing field for both criminals and police who use technology to their advantage; in the case of police to solve crimes and for criminals to perpetrate crime (Hoque et al., 2016).

2.4.2 ICT in Metro police and traffic management

Metro and traffic police forms an important basis for the security of the road usage rules by motorists and vehicles in ensuring safety in property (vehicles) and proper use of the roads facilities. In a study conducted by Salisu et al. (2020) on analysing information and communication technology for improved intra-city traffic flow in Ibadan city, Nigeria, the study highlighted the need for ICT in Metro police department. Technology was argued to be a vital

resource for police forces from recording crimes to communicating with the public, the police's work relies heavily on its ICT systems. The need for installed speed cameras along highways is crucial in which the South African traffic police department has made significant progress though there is still more work to be done in small towns and in most locations (suburbs). It is argued that it is the responsibility of SETAs like SASSETA to ensure that every department has the required skills and ICT systems that that ensures the safety of the public.

2.4.3 ICT in prisons

ICT in prison has received much attention not only in South Africa but all over the world. (Greyvensteyn, 2018) argues that it the task of sector training institutions like SASSETA to ensure that there is the required ICT and technical skills in correctional services so that the rehabilitation process is effective. This sees most countries coming up with technology uptake in correctional centers as a way of ensuring a good rehabilitation of the inmates. Technology is rapidly changing and expanding in every field imaginable, in every aspect of our life, transforming it.

Akinsanya et al. (2020) conducted a study on the Influence of Information and Communication (ICT) Maturity on Nigerian Correctional Education Services in Nigeria and showed that few years ago, a number of improvements have been made in the prison systems. These improvements includes:

- internet access to prisoners
- e-health and e-learning for prisoners
- use of mobile devices in prison
- iPads for officers
- video-conferencing
- Prisoner information management system;
- Use of Biometrics
- Prisoner healthcare management system;
- Use of mobile devices in prisons
- Family visits by video conferencing.
- Enterprise mobility,
- electronic monitoring,
- infrastructure for inmates
- Offender management systems

The above pointed out uses of ICT in prison are useful both for the prison officers and the inmates themselves. Prisons to use video conferencing due to the COVID-19 pandemic (Digard, 2020). Family should talk to their loved ones in prison through video conferencing so as to reduce physical visits that helps in the spread of the virus. Countries should allow the use of internet by prisoners so that they keep in touch with the world. The information they learn from the internet can speed the rehabilitation that is they are controlled as well (Hart, 2019).

However, according to European Prison Education Association (2016), it is also noted with concern that serious precautions has to be taken when introducing such ICT in prisons for they can motivate the inmates to badly influence others outside or planning of their escapes from prisons through their communication. Also, it is SASSETA's role in ensuring the

delivery of technical skills to the prisoners so that by the time they get out of prison, they will have practical courses they can do to make them stay out of trouble. Therefore, it is noted these security service participants must strengthen their relationships with these training institutions for they bring ICT and technical skills for the betterment of the sector.

2.4.4 South African Security Services and ICT

Both theoretical and empirical literature reviewed have highlighted some of the primary issues in safety and security of any society. Therefore, SASSETA should also consider some of the issues raised so that the services they offer in training are updated. ICT has been seen to work much better in making the sector efficient.

Hence, SASSETA should invest much in ICT as they ensure that the safety and security department which they educate and train professionally are of greater use in different departments they work in. ICT and technical skills help the security sector in a number of ways:

i. The need to detect, understand and act upon end points

There is need to detect, understand and act on endpoints such as laptops, desktops and servers are often the first point of entry for attackers. Every security department in the country uses ICT hence, there is need to use these ICT skills in organizations in detecting, patching and remediating threats that haunts the safety and security of the society. SASSETA should ensure that in their training sessions and courses it is taught on how to effectively conduct that.

ii. Leveraging advanced analytics to eliminate threats

Networks and endpoint devices generate an immense, often unmanageable amount of data and this problem grows every day. Buried in this data are key indicators that analysts need to uncover attacks. Some refer to this problem as a needle buried in a stack of needles. This tool collects, correlates and analyzes vast quantities of security data, providing security analysts with a risk-prioritized threat view, and enabling rapid analysis and remediation of threats (Dong et al., 2015). It also entails information protection by all security agents in the economy and since information is key, training institutions should prioritize safety of information in all security service departments.

iii. Deploy Cognitive Security

Key to combating today's advanced threats is deploying an adaptive, integrated security architecture that combines machine learning with real-time threat sources, regardless of whether it's structured or unstructured.

Cognitive security solutions can continuously ingest and learn from hundreds of security knowledge sources, much of which was previously unusable by traditional security tools. This enables security experts to fill gaps, improve productivity and increase accuracy in all security departments covering intelligence, metro police, SAPS, correctional services and others. This makes ICT functional in these organisations through the training obtained from institutions like SASSETA.

iv. Hunt for Attackers and Predict Threats

It is important to proactively hunt for threats even before they appear in the in the society. It's clear that preventing, detecting and responding to ongoing threats on the network is a top priority for security professionals and this can be achieved by immense ICT and technical skills development for security agents which training institutions like SASSETA offer. The police department through the use of effective ICT should be able to hunt and predict crime before they happen as well as the army and the national intelligence for the safety of the community.

v. Orchestrate and Automate Incident Response

Good security includes prevention, detection and response. With the help of an incident response platform, a security department can align its staff, process and use technology to drive improved resilience. These solutions integrate the organization's existing security and IT systems into a single hub for orchestrating and automating the incident response processes, making security alerts instantly actionable while adding intelligence and incident context.

They also adapt to real-time incident conditions and ensure that repetitive triage steps are complete before an analyst even opens the incident. All these are ICT and technical skills possessed by members of the security force which enables those different organisations to be able to combat security threats.

vi. Investigate and Detect Attacks with Threat Intelligence

Cybercriminals are collaborating on an unprecedented scale, sharing intelligence related to vulnerabilities, exploits, tools and countermeasures. Many make their money by selling this information to other criminals. This applies to every security department and in prisons, allowing the use of internet and mobile force has the danger of the prisoners to pass criminal information to other people which can result in increased crime rate. Therefore, it requires a well-planned ICT development strategy for the security developed by education and training institutions like SASSETA that makes jobs easier but also not creating a gap for further offenders.

To combat this growing trend, security professionals must collaborate as well. By using a threat intelligence platform to facilitate cross-organizational collaboration, security teams can gain a much more complete understanding of threats, threat actors and emerging threats such as zero-day vulnerabilities. This advanced insight lends human context to machine-generated data which is an ICT and technical skill that helps security organisations a better place.

2.5 Conclusion

It has been noted that there are similar benefits that accrue to almost every sub-sector that falls under the South African security services because of the use of ICT in these sectors. The prime benefit of technology in any sector is its efficiency in all operations. SASSETA still must do more in its training programs in ensuring that the South African country has the latest technology which makes is easier and faster to carry any tasks.

The only way SASSETA can take note of these improvements that needs to be done is to take an intense empirical research. The most informative way of conducting the research in

this case is through the use of primary mostly using primary obtained from the main stake holders. The immense research conducted would give firsthand information on the experience of stakeholders with ICT and technical skills they obtain from the authority. The research would give the suggested solutions to the real problems they are facing.

3.1 Introduction

The main of the study is to find the impact of strengthening partnerships with sector training institutions on the supply of information communication and technology (ICT) and technical skills. The study also aims to propose possible ways of strengthening SASSETA'S partnerships with sector training institutions. This is in line with the National Development Plan and the National Skills Development Plan III.

The previous section reviewed the theoretical and empirical literature related to the study. The literature review gave appropriated insights into the methodology to be followed by this study in order to attain reliable results. In this section, an overview of methodology used in the study is provided. The discussion in the chapter is structured around the research design, population sampling, data collection and data analysis. Research methodology includes the collection, interpretation and analysing research findings. Methodology, in the current study, refers to how the research was done and its logical sequence.

3.2 Research design

A research design serves as a framework for collecting and analysing data and the choice of research design reflects the priority given by the researcher to a range of dimensions of the research process. In this case, the following aspects are relevant: Understanding behaviour and the meaning of that behaviour in its specific social context and having a temporal appreciation of social phenomena and their interconnections; expressing connections between variables and generalising to larger groups of individuals than those forming part of the investigation.

A research design is also a plan or blueprint of how research is conducted, and the type of study required to provide acceptable answers to the research problem or question. This study is not in the domain of developing new theory but is more about creating an understanding of the future to construct a strategic outlook. Whereas theory construction would imply findings that can be confirmed and generalised within certain boundaries, the intent of this specific study will be focused more on the construction of possibilities that could be argued on the ground of current trends and perspectives of the future.

The knowledge and insights of a range of key experts in the field under focus, as well as authoritative secondary data, are typical sources of data for this study. In this research, it primarily focused on tapping the views from a purposively selected group of stakeholders by means of interviews and dialogue, in other words, qualitative data.

Qualitative study is described as ideal for exploring the meaning and understanding of concepts as well as identifying the pervasiveness of phenomena and patterns of association (Babbie, 2010). Against the background outlined above and the suitability of the current study, a qualitative research design will be used. This approach enables pattern identification in data, which is crucial in drawing conclusions with regards to the research objectives. However quantitative tools were also used to assist the data collection and to have a better understanding of the data.

3.3 Target Population, Sampling Techniques and Sample Size

In research terminology the Population can be explain as a comprehensive group of individuals, institutions, objects and so forth with have a common characteristics that are the interest of a researcher¹. For the study, the population is the total number of training institutions that partnered with SASSETA. In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalise the findings from the research sample to the population as a whole.

To draw conclusions about populations from samples, we must use inferential statistics, to enable us to determine a population's characteristics by directly observing only a portion (or sample) of the population. The study used a sample of 7 institutions using stratified random sampling.¹

There are various sampling techniques in literature. This research will follow a stratified simple random sampling approach which is best suitable and reliable for this study. The strata for the study consist of different classifications of the training institutions that partnered with SASSETA and a sample of 7 was picked. Simple random sampling was used to pick the sample within each stratum. The size of the sample in each stratum was proportional to the size of each stratum.

Table 2.1 Strata and sample size

Strata	Sample Size
Universities	2
TVET colleges	3
Professional bodies	2
Overall	7

3.4 Data Collection and Research Instrument

The study uses the primary data since it is more reliable and suitable for the study. The study aims to understand issue under study from the stakeholders involved hence the need to collect first hand data. The research instrument chosen for this study is a survey questionnaire.

The questionnaires will be electronically distributed to the respondents vial emails, with only the few ones being self-administered to the respondents who may not be able to assess the emails and those who may be illiterate and not technology friendly. This method of data collection was chosen because of convenience and speed. There are three different sections of the questionnaire.

The first section of the questionnaire covers the socio-demographic elements of the respondents to provide an understating of their calibre. The second section covers questions impact of strengthening partnerships with SASSETA on the supply of information communication and technology (ICT) and technical skills. Third section of the questionnaire

¹ <https://tophat.com/marketplace/social-science/education/course-notes/oer-research-population-and-sample-dr-rafeedalie/1196/#:~:text=In%20research%20terminology%20the%20Population,the%20interest%20of%20a%20researcher.&text=The%20process%20of%20conducting%20a,population%20is%20called%20a%20census.>

consists of the suggested possible ways to improve the strengthening SASSETA's partnerships with sector training institutions.

3.5 Information and data analysis

Bryman and Bell (2011) argued that early coding assists the researcher to understand the available data, while also alleviating feelings of being swamped by data, which may happen when analysis of data is deferred to the end of the data collection period.

The processing of qualitative and quantitative research data obtained from the sources used in this study adopted a pragmatic approach based on early and consistent coding during content analysis, as advocated by Bryman and Bell (2011).

Analysis of the primary data from the questionnaires commenced after the data was complete and coded. The coding of the qualitative data from primary sources was largely based on the codes associated with a set of the key questions that were answered in this study. The study will use content analysis in analysing the data. This refers to the process of categorizing verbal or behavioural data to classify, summarize and tabulate the data. This is one of the most common methods to analyse qualitative data.

It is used to analyse documented information in the form of texts, media, or even physical items. When to use this method depends on the research questions. Content analysis is usually used to analyse responses from interviewees².

3.6 Limitations

One of the limitations of the study is that it was constrained by time as some of the stages in the research started late due to delays. In addition, the Covid-19 pandemic has limited the study to use questionnaires which could be sent online hence interviews were difficult to conduct and thus were eliminated.

The study also used the data from participants who could not understand the issues under study quiet well and would confuse the issues being asked in the questionnaires, however the cases were few.

The next section shares the findings from all the stakeholders who participated.

² <https://humansofdata.atlan.com/2018/09/qualitative-quantitative-data-analysis-methods/>

4.0 Introduction

The findings of this report are presented within the framework of the scope and key research questions as specified in the research terms of reference as was classified in part three. The results are presented based on the data collected using the questionnaires and data from secondary sources as well as the literature review.

4.1 Findings

4.1.1 The nature of the partnership between sector training institutions and SASSETA

The different institutions that partnered with SASSETA indicated that they had a partnership to develop skills that were in shortage. The indication was the same across all respondents thus SASSETA has the same nature of partnership with the universities, colleges and the professional bodies. The responses were in line with the Safety Sector skills plan 2021/2022 which outlined the existing partnership and the proposed partnerships including the nature of those partnerships.

4.1.2 The demand of ICT and technical skills

It was found that before the partnerships between sector training institutions and SASSETA, there were certain skills that were in shortage and were demanded from the sector training institutions. The skills are listed below:

- ❖ Programming
- ❖ Software development
- ❖ Computer maintenance
- ❖ Cyber security
- ❖ Soft skills
- ❖ Data analysis
- ❖ Networking

4.1.2 Skills targeted by the partnerships

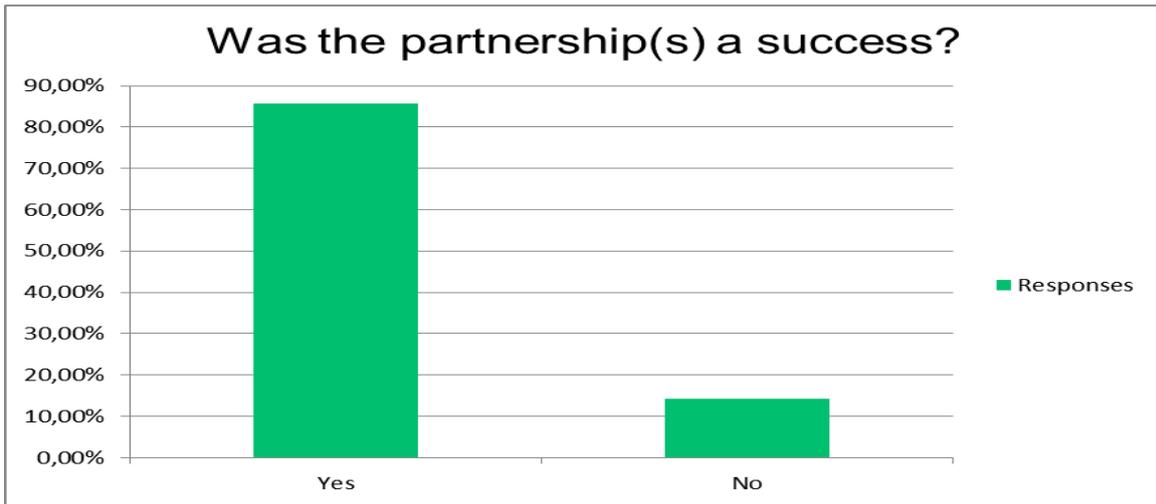
The partnerships targeted the skills that were identified as in shortage as listed in 4.1.2. Safety Sector skills plan 2021/2022 outlined that the technical related skills change was driven by the Industrial revolution 4IR. The partnerships aimed to supply the ICT and technical skills such that the demand of those skills will be met and improve the economy of South Africa. The rise in the crime rate in the crimes associated with technology has raised the need for counter-skills to combat that crime hence the need for skills such as cyber security.

4.1.3 The outcomes of the partnerships

i. The success of the partnerships

The respondents were asked whether the partnership was a success or not and the responses are shown below in figure 4.1.

Figure 4.1: Indication of whether the partnership was a success or not



As shown in figure 4.1, the majority of the partnership between SASSETA and the sector training institutions were a success. From the Safety Sector Skills plan 2021/2022, the partnerships that were not recorded as successful were facing some challenges and were still to improve as the identified challenges could be solved.

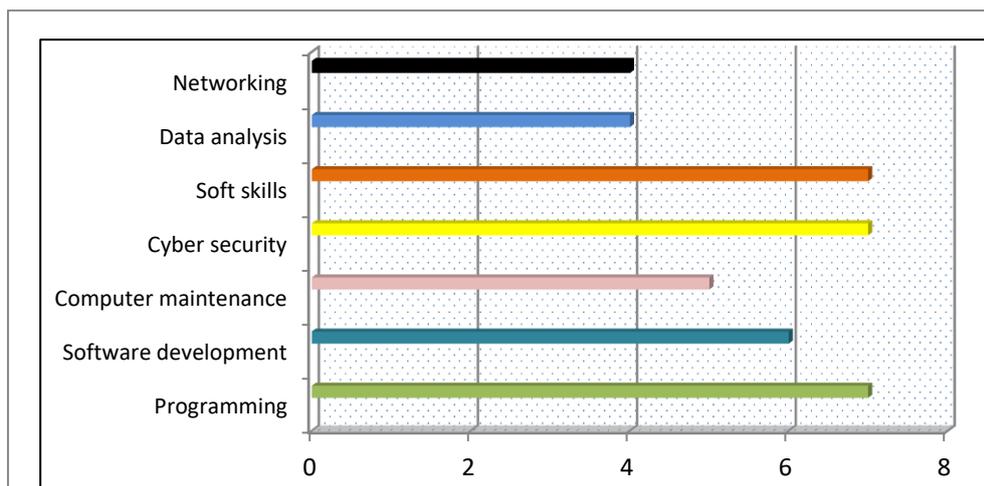
ii. The skills attained

The most successful partnerships were the professional bodies partnerships which have seen development of various skills related to the security sector. Other institutions were still under the skills development programme but the students were gaining the targeted skills as planned. It was noted that the graduates who had acquired the skills under the SASSETA skills development programme were absorbed very fast in the economy. Those trained under Department of Correctional Services were employed by the department to fill the vacant post. The skills acquired are:

- ❖ Programming
- ❖ Software development
- ❖ Computer maintenance
- ❖ Cyber security
- ❖ Soft skills
- ❖ Data analysis
- ❖ Networking

The figure 4.2, below indicates the skills acquired on a scale of frequency according to the number of institutions that mentioned the skill.

Figure 4.2: Skills acquired under SASSETA’s skills development programme



As shown in figure 4.2, programming, soft skills and cyber security were mentioned by all the respondents thus all the institutions in the sample managed to produce these skills. As seen from the effects of globalisation, programming has become an important skill.

In the security sector, the security systems needs to be programmed and currently the work of that nature is being contracted out thus a need to develop a workforce in the safety and security sector that have programming skills. Soft skills are the most basic skills that the workforce in the security sector is expected to have even those that are not doing technical work. Soft skills are also relatively easy to produce and all the institutions in the sample managed to produce them.

The lowest mentioned were networking and data analysis which were mentioned by four respondents but there are equally important hence there is a need to further improve their supply. It can be therefore seen that the partnerships are working, and targeted skills are being produced and the others that were not mentioned by all the institutions have not yet been completed by the remaining institutions.

iii. Improvement in the supply of ICT and technical skills

Figure 4.3: Improvement in the supply of ICT and technical skills (responses)

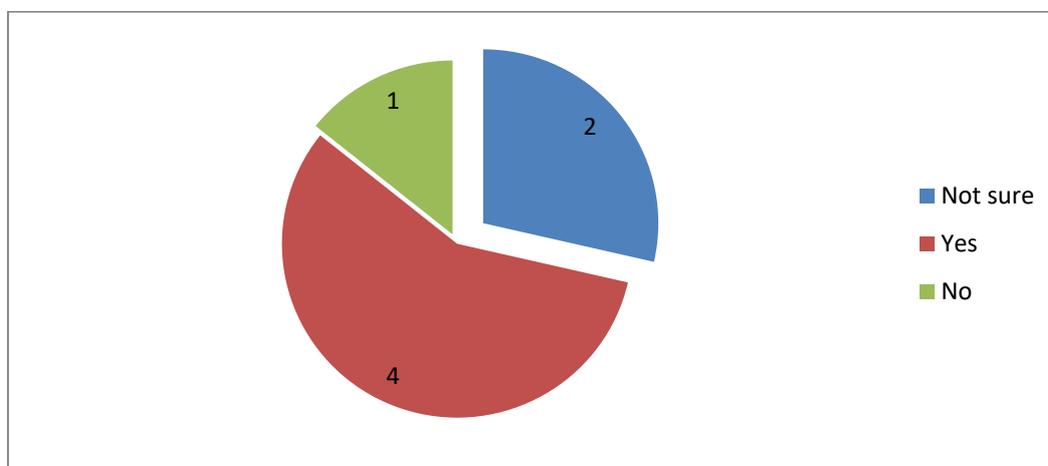


Figure 4.3 indicates the responses when the respondents were asked to give opinion on whether the partnership with SASSETA improved the supply of ICT and technical skills

among the security forces in the South African economy. It is shown that four of the respondents agreed that the supply of ICT and technical skills improved, one did not agree and two were not sure. The majority indicated that there was an improvement in the supply of ICT and technical skills and hence it can be concluded that the partnerships improved the supply of ICT skills.

iv. The impact of the partnership between the training institution and SASSETA in the supply of ICT and technical skills

The following responses were agreed to by the majority of respondents. Those that agreed were more than 50% in all the cases.

- ❖ More students registered under the ICT and technical related programmes
- ❖ The curriculum was improved to encompass the advanced ICT and technical skills required among the security forces
- ❖ Graduates with ICT and technical skills increased after the partnerships, and
- ❖ The quality of security forces with ICT and technical skills improved.

The results are shown in the table below as compiled by the researcher from the data

Table 3.1: The impact of the partnership between the training institutions and SASSETA in the supply of ICT and technical skills

TRAINING RELATED IMPACTS	Number of Yes responses	Number of No responses
More students registered under the ICT and technical related programmes	7	0
The curriculum was improved to encompass the advanced ICT and technical skills required among the security forces	7	0
LABOR MARKET RELATED IMPACTS		
Graduates with ICT and technical skills increased after the partnerships	6	1
The quality of security forces with ICT and technical skills improved	4	3

4.1.4 Possible ways of strengthening partnerships with SASSETA

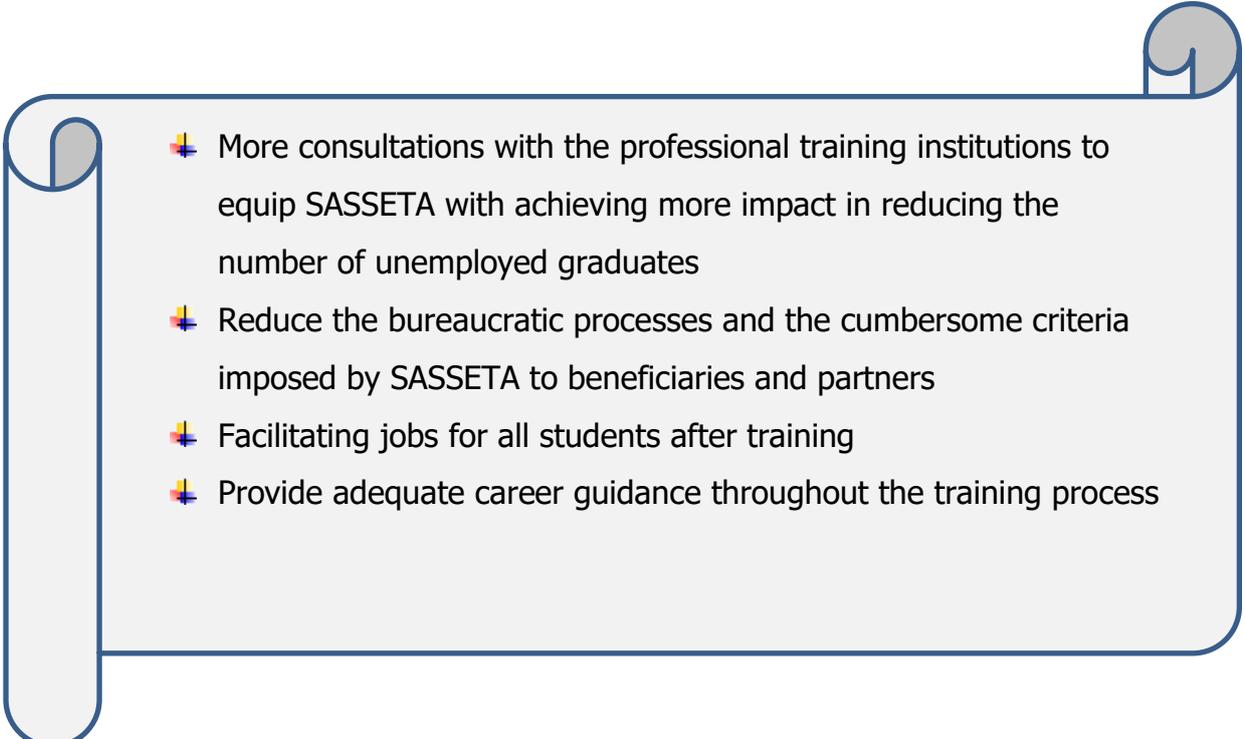
The respondents were asked a question of whether they agree or they do not agree with the suggested possible ways of strengthening partnerships with SASSETA. The results are presented in the table below.

Table 4.3: Possible ways of strengthening partnerships with SASSETA

Possible way	Number of Yes responses	Number of No responses
Developing curriculum to suit the ICT and technical skills needs	7	0
Investing in equipment to be used for practical learning	7	0
Recognition of the most performing training institutions	7	0
Developing long term partnerships	7	0
Improving the infrastructure used in learning institutions	7	0

From table 4.2, it is clear that the suggested possible ways to strengthen partnerships between training institutions and SASSETA were agreed to by all respondents. From those who explained, it is noted that there is a need to enhance practical learning such the required infrastructure and equipment for practical learning will be in place to facilitate more of the practical side of learning.

The curriculum also in support of the practical learning needs to be adjusted to suit the current needs of the economy and the world at large. The partnerships also need to be long term in most cases so that both parties involved will put all their effort for both short term and long term benefits. The most performing institutions need to be recognised in a bid to motivate them for better performance. The respondents from their opinion also listed some possible ways that can strengthen the partnership between SASSETA and sector training institutions and they are listed below

- 
- ✚ More consultations with the professional training institutions to equip SASSETA with achieving more impact in reducing the number of unemployed graduates
 - ✚ Reduce the bureaucratic processes and the cumbersome criteria imposed by SASSETA to beneficiaries and partners
 - ✚ Facilitating jobs for all students after training
 - ✚ Provide adequate career guidance throughout the training process

From the ways listed above, SASSETA should continuously engage the partners and the learners under the skills development programme for a better outcome of the partnerships. Also, SASSETA should focus on the employment aspect of the learners when they complete their programmes.

Part five: Conclusions and Recommendations

5.0 Introductions

The reviewed literature and the responses from the chosen stakeholders, have given rise to a stimulating and certainly relevant debate concerning the impact of partnerships between SASSETA and sector training institutions in the supply of ICT and technical skills. This issue addresses pressing safety and security issues that are central to the future of SASSETA, Safety and Security, employment, economic development, and individual wellbeing, across the Country. Some main points can be extracted from this review.

5.1 Conclusions

Skills mismatch can be perceived as a result of labour market and training market imperfection. Changes in supply and demand can cause mismatch as information about these changes does not reach the relevant people soon enough to adjust decisions and behaviour.

Changes in the demand for labour include both changes in numbers of jobs available in the labour market (quantitative changes) and the structure of skills needed to perform a job (qualitative changes).

It is concluded that the nature of the partnerships between the sector training institutions and SASSETA was of developing skills in order to address the skills shortage in South Africa. This is in line with the Safety Sector skills plan 2021/2022 which outlined the existing partnership and the proposed partnerships including the nature of those partnerships.

There is a shortage of ICT and technical skills in South Africa hence these partnerships aimed to address this issue. There are certain ICT and technical skills which are in shortage programming, software development, computer maintenance, cyber security, soft skills, data analysis and networking.

These are the skills needed in the modern day industry and beyond and are in line with the fourth industrial revolution (4IR). The safety and security sector is becoming technical in nature with current world trends hence it is also demanding these skills. Another observation from the study is that the partnerships between SASSETA and the training institutions aimed the skills that were in shortage as mentioned before.

The partnerships had specific skills targeted for and these were aimed to improve the operations of the safety security sector. It can be concluded that the majority of the partnerships between SASSETA and the training institutions were successful as indicated by the responses from the sample. The partnerships were a success since the students were already acquiring the intended skills and some of the courses were already completed.

The skills that the partnership produced were programming, software development, computer maintenance, cyber security, soft skills, data analysis and networking. It is, therefore; the partnerships between SASSETA and the training institutions have a positive impact on the supply of ICT and technical skills. Notwithstanding, it should be noted that little has been done in this area. SASSETA needs to reconsider its strategy and approach in addressing ICT skills in the sector or influencing the supply of ICT skills. It was also

observed that more students registered under the ICT and technical skills related programmes. This was as results of an opportunity which has arisen and to explore new areas.

Also, the curriculum at the training institutions was improved to encompass the advanced ICT and technical skills required among the security forces. There were adjustments to the current curriculum and this was a success. Moreover, graduates with ICT and technical skills increased after the partnerships, some of the institutions indicated that the number of graduates increased. This was in a bid to meet the demand of the skills under the on-going programmes. Another observation is that the quality of security forces with ICT and technical skills improved.

The study observed that there are possible ways in which the partnerships between SASSETA and the training institutions could be strengthened and ensure they succeed and bring out more of the expected results. The first way is to develop curriculum to suit the ICT and technical skills needs the second way is by investing in equipment to be used for practical learning, the third way is the recognition of the most performing training institutions; the fourth way is to develop long term partnerships and lastly by improving the infrastructure used in learning institutions.

These ways could be supported by policy such they that they are implemented quickly and effectively in line with the National Skills Development plan. It was also noted that to strengthen the partnerships the following can be done; more consultations with the professional training institutions to equip SASSETA with achieving more impact in reducing the number of unemployed graduate, reduce the bureaucratic processes and the cumbersome criteria imposed by SASSETA beneficiaries and partners, facilitating jobs for all students after training, provide adequate career guidance throughout the training process.

5.2 Key recommendations

There are currently a lot of benefits that the partnerships between SASSETA and the training institutions are reaping and there are also opportunities which can be exploited further. Below are recommendations that stems from the ideas put forward by the respondents.

i. Focusing on the practical learning

The ICT and technical skill required and aimed for by SASSETA are thus practical in nature. It is therefore recommended that the learning processes be structured in such a way that the greater part of the course becomes practical rather than a situation where graduates will starts experiencing the greater practical work on the job.

It is advisable that the learners engage in the real world issues and needs as they learn hence when they go to work it will be a transition only from school to work and will not worst much time in trying to grasp the practical at work. This will increase the value addition in the supply of quality skills in the safety and security sector.

ii. Reduce the bureaucratic processes and the cumbersome criteria imposed by SASSETA to beneficiaries and partners

The bureaucratic and cumbersome processes involved in the application, documents submissions, validation and others can be a hindering factor to the success of many SASSETA partnerships. It was noted from the Sector Skills Development plan that there are number of partnerships that were not completed yet and they were in progress with a lot of documents to be submitted.

Also, the challenges recorded during these partnerships involved the issue of too much documentation and procedures. It is therefore recommended that SASSETA reduce the documentation processes and procedures and other unnecessary consultations that can be eliminated. It is also advice that some processes be done online only and save time.

iii. Provide adequate career guidance throughout the training process

The development of skills under the programmes of SASSETA to meet the skills demand is well understood by the providers of the programme but not by the learners whom are the beneficiaries. There is a need for adequate career guidance even at the beginning of the programmes so that learners choose the programmes they are willing to undertake. The leaners should also be continuously guided during the training so that they understand the importance of the skills they are undertaking and how they will use them.

The career guidance will also encourage performance so that the leaners will perform well during the training as some may be focusing on the security training without understanding the importance of the ICT and technical skills in their future work.

iv. Facilitating jobs for all students after training

Some leaners can be encouraged to undertake certain ICT and technical skills if they are assured that they will be employed and can have certain advantages of being employed quickly after completion of school. It is a world-wide phenomenon that the skills in question are in demand but there are cases where those with such skills find it difficult to secure employment hence supply and demand are not meeting at equilibrium which may be due to various reasons.

It is therefore recommended that SASSETA be involved in securing employment for the learners under its programmes. Those in the security forces can be given assurance of certain specific positions for people with special ICT and technical skills hence they will be motivated.

5.3 Closing remarks

The globalisation has changed the world and the skills needs are changing too. With the fourth industrial revolution (4IR) in place the ICT and technical skills are becoming highly demanded while the supply is still low. The rate of technological advancement has called for such skills in most of the workplaces including the security forces whether public or private as new systems are being developed.

Not following the technological advancement in security will only entail that soon the services one will be providing will soon not be on demand. There are new programmed security systems and the security forces need to be part of it as some will lose jobs in the near future

as they become less relevant. The theory, empirics, trends, news has it that the ICT are important, and the supply of skills can be improved through supporting focused and tailor made skills development as done by SASSETA. This will not only improve the way work is done but will also improve the economic growth of nations moreover in Africa.

References

- Adams, D. A., R. R. Nelson and P. A. Todd (2015). "Perceived Usefulness, Ease of Use, and Usage of Information Technology. A Replication", *MIS Quarterly*, (16)2, pp. 227–247.
- Akinsanya, A., Adeniyi, A. and Okunola, L., 2020. Influence of Information and Communication (ICT) Maturity on Nigerian Correctional Education Services. *KIU Journal of Humanities*, 5(3).
- Babbie, E., 2010. Research design. *The practice of social research*, pp.85-88.
- Behan, C., 2016. Report from the European prison education association. *Journal of Correctional Education*, pp.305-307.
- BLS (2013), "Careers in growing field of information technology services", Beyond the numbers, Vol. 2, No. 9, April 2013.
- Bryman, A. and Bell, E., 2018. *Business research methods*. Oxford university press.
- CJI. 2012. Career Junction Index. DOI=<http://www.cji.co.za>.
- Cohen, D. 2012. The IT Skills Gap is Everyone's Business. DOI=<http://www.idgconnect.com>.
- Comrey, A.L. and Lee, H.B., 1992. Interpretation and application of factor analytic results. *Comrey AL, Lee HB. A first course in factor analysis*, 2, p.1992.
- Davis, F. D. (2018). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly* (13)3, pp. 319–342.
- Digard, L., ZM Di, A. Yaroni, and J. Rinaldi. (2020) "A New Role for Technology? Implementing Video Visitation in Prison. New York, NY: Vera Institute of Justice. URL." DoL. 2007. Department of Labour (DoL). National Masters Skills List for 2007. DOI=<http://www.labour.gov.za/>.
- Dong,Y., Zhitao, G., Liu, P and Min H. (2015) Research of Communication Platform of Intelligent Public Transportation System Based on GPRS. Springer-Verlag New York. vol. 138 (10), pp.:155-161.
- European Commission (2014a), European Vacancy Monitor, Issue No. 12, February 2014, <http://ec.europa.eu/social/BlobServlet?docId=11426&langId=en>.
- European Commission (2014b), E-Skills for jobs in Europe: Measuring progress and moving ahead, Final report.
- Fanibuyan, C. (2019). Training and Development, A Vital Tool for Organizational Effectiveness, *Journal of Business and Management*, 6(2), pp 48-57.
- Greyvensteyn, K.G., 2018. *Using e-learning to enhance education in correctional institutions in South Africa* (Doctoral dissertation, University of South Africa).
- Hart, S., 2019. Making Prisons Safer Through Technology. *The American Correctional Association*, 65(2), pp.18-22.
- Hoque, Z., Arends, S., & Alexander, R. (2016). Policing the police service: A case study of the rise of "new public management" within an Australian police service. *Accounting, Auditing & Accountability Journal*, 17(1), 59-84.
- ISETT SETA. 2007. Information Systems, Electronics and Telecommunications Technologies Sector Education and Training Authority (ISETT SETA) Sector Skills Plan 2005- 2010. DOI= <http://www.isett.org.za>.

Kimmett, E. (2016). Through the gateway: How Computers Can Transform Rehabilitation, Nina Champion. *Journal of Information and Communication Technology*, vol 9(7) pp. 6-9.

Lacey, T. Alan and Wright, Benjamin, "Occupational employment projections to 2018," *Monthly Labor Review*, November 2009, pp. 82-123.

Lesia, L., 2020. Public Participation In Local Government In South Africa: A Case Study On Decision Making In Street Naming In Kwamashu Township Of The Ethekweni Municipality. *Journal of Information and Communication Technology development*, 55(2), pp.123-132.

Manpower Group South Africa. 2014. Where are South Africa's biggest Employment Shortages? DOI=<http://www.saleader.co.za>.

Mason, A. C. (2015). Continuity and change in the history of police technology: The case of contemporary crime analysis. Thesis. Rochester Institute of Technology. Retrieved from <http://scholarworks.rit.edu/theses/8634>.

Nuth, M. S. (2018). Taking advantage of new technologies: For and against crime. *Computer Law & Security Review*, 24(5), 437-446.

OECD (2014a), Forecasting Future Needs for Advanced ICT Competence in Norway, DSTI/ICCP/IIS(2014)5.

Queen E, B. (2019). The Impact of Computer and Internet Security Training for Undergraduate Students: Attitudinal Changes. *Journal of Issues in Information Systems* Volume 10(), pp. 191-197.

Salisu, U.O., Akanmu, A.A. And Fasina, S.O., 2020. Information and Communication Technology for Improved Intra-City Traffic Flow in Ibadan City, Nigeria. *Journal of Academic Research in Economics*, 12(2).

Seedat, M., Van Niekerk, A., Jewkes, R., Suffla, S., & Ratele, K. (2019). Violence and injuries in South Africa: prioritising an agenda for prevention. *The Lancet*, 374(9694), 1011-1022.

Spiezia, V; Koksal-Oudot, E; Montagnier, P., 2016. New Skills for the Digital Economy: Measuring the demand and supply of ICT skills at work. Available at https://www.oecd-ilibrary.org/science-and-technology/new-skills-for-the-digital-economy_5jlwnkm2fc9x-en. Accessed on 13/01/2021.

Stanton, J. M. (2015). Information technology and privacy: A boundary management perspective. In S. Clarke, E. Coakes, G. Hunter, & A. Wenn (Eds.), *Socio-technical and human cognition elements of information systems* (pp. 79–103). London: Idea Group.

Stanton, J. M., & Weiss, E. M. (2017). Electronic monitoring in their own words: An exploratory study of employees' experiences with new types of surveillance. *Computers in Human Behavior*, 16, 423–440.

Stanton, J. M., & Weiss, E. M. (2017). Organisational databases of personnel information: Contrasting the concerns of human resource managers and employees. *Behaviour and Information Technology*, 22(5), 291–304.

VanVoorhis, C.W. and Morgan, B.L., 2007. Understanding power and rules of thumb for determining sample sizes. *Tutorials in quantitative methods for psychology*, 3(2), pp.43-50.

Venkatesh, V. and F. D. Davis (2017). "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies", *Management Science* (46)2, pp. 186–204.

Venkatesh, V., F. D. Davis and M. G. Morris (2016). "Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research" *Journal of the Association for Information Systems* (8)4, pp. 267–286.