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The influence of digital literacy initiatives in South Africa : a Nemisa case study

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The influence of digital literacy initiatives in South Africa. A Nemisa case study

Letlotlo Kenneth Moleko

0506872T

0506872T@students.wits.ac.za

0731362535

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business

Johannesburg, 2022

ABSTRACT

The aim of the study the Influence of digital literacy initiatives in South Africa. The study focuses on the National Electronic Media Institute of South Africa (NEMISA which was initiated in 1998 with the core purpose of being an education, learning and technical skills centre for the Television, Radio and Broadcasting industries. Studies on the influence of digital literacy initiatives in South Africa are limited. Therefore, a need exists for a thorough understanding of these digital literacy initiatives' influence in improving economic and job opportunities for the target user groups.

A qualitative case study research methodology was used to establish deeper insights and perspectives from multiple stakeholders to ensure a holistic and in depth view of these initiatives within their natural context. 14 individuals were interviewed and 6 of the of the respondents were current and former students of NEMISA.

The research study adopted the Multiliteracies framework as a means for understanding how the evolution of technology impacts the learning context and identify ways to improve digital literacy in the cultural context of South Africa. The research study uncovered six key themes which comprised namely accessibility, e-learning, economic viability, future Skills, lifelong learning and partnerships.

The results from this research revealed that digital literacy training provided by NEMISA improved the opportunity to gain job opportunities for students, improved access to institutions of further learning, and aided in motivating lifelong learning.

The researcher recommends digital literacy to be introduced at basic, secondary and tertiary education levels.

KEYWORDS

Digital literacy, multiliteracies, digital skills, e-learning, lifelong learning.

DECLARATION

I, Letlotlo Kenneth Moleko, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Letlotlo Kenneth Moleko



Signed at: Johannesburg

On the 28 day of February 2022

DEDICATION

I am thankful for the love, prayers, support and patience of my family, and I am forever grateful for their understanding, inspiration and patience in this highly rigorous process of undertaking this research.

ACKNOWLEDGEMENTS

I would like to thank God for the strength to press on from start to finish.

I would like to thank my family for providing the support structure for me to focus on my studies and taking on the strain of seeing me through this course either by encouragement, offering resources and sometimes taking on my other responsibilities.

I would like to acknowledge my management for giving me the impetus to begin, your support has been life-changing for me.

I would like to acknowledge and appreciate my Supervisor. Thank you for the guide rails for the coaching and the encouragement.

Thanks also go to my friends who kept motivating me during this course and kept offering advice that always moved me a step forward.

I also want to send my gratitude to the respondents that participated in this interview as I would not have been able to get as much rich insights as you have provided.

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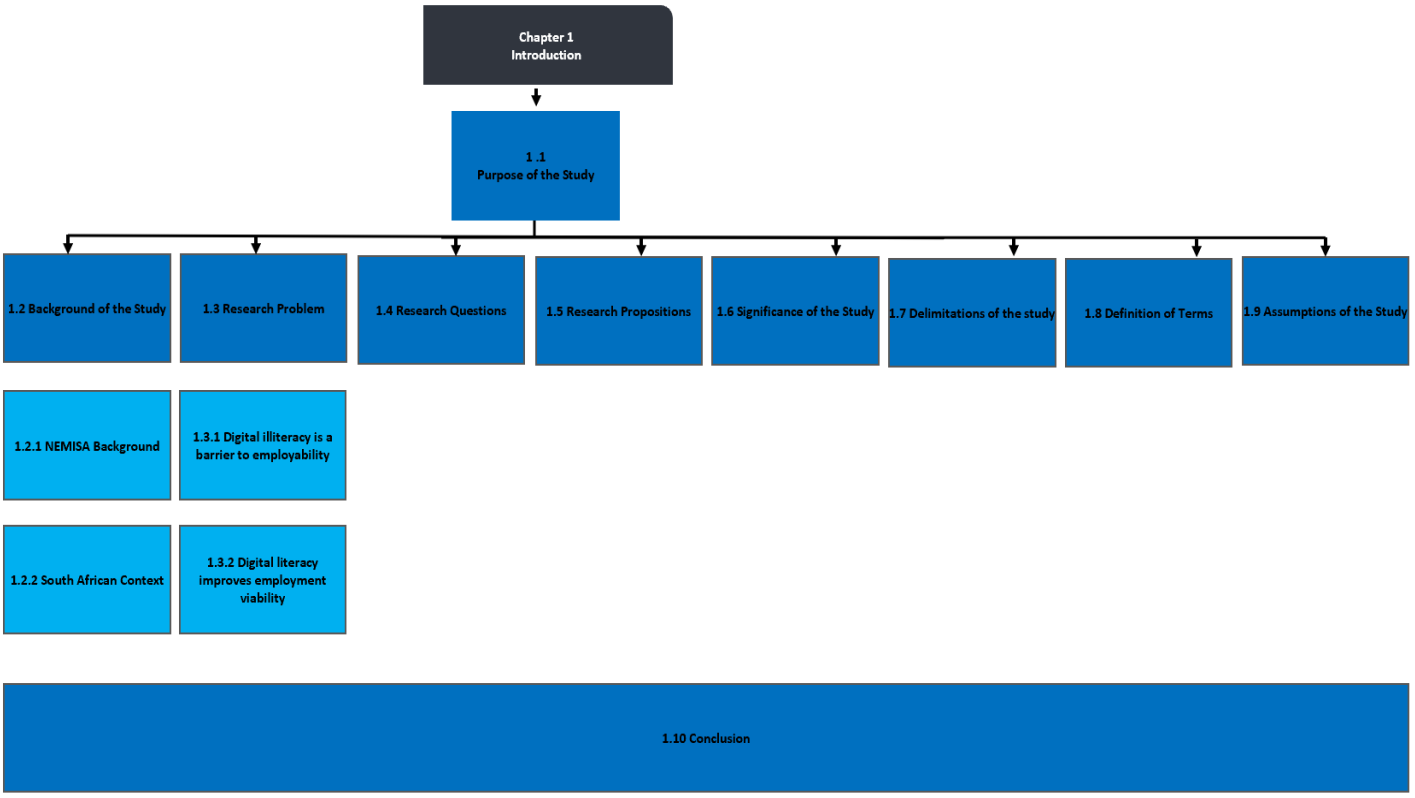
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LIST OF ACRONYMS

4IR	The Fourth Industrial Revolution
ADIA	Australian Digital Inclusion Alliance
AI	Artificial Intelligence
COVID-19	Corona Virus
CV	Curriculum Vitae
DBE	Department of Basic Education
DHE	Department of Higher Education
DHET	Department of Higher Education and Training
DCDT	Department of Communication and Digital Technologies
DoC	Department of Communication
DoL	Department of Labour
DSI	Department of Science and Innovation
EDUNET	Education Network
FET	Further Education and Training
GCIS	Government Communication Information System
GDP	Gross Domestic Product
GNP	Gross National Product
HRD	Human Resource Development
ICT	Information Communication Technology
ICT4D	Information and Communications Technologies for Development
IBM	International Business Machines
ITU	International Telecommunications Union
JISC	Joint Information Systems Committee
JIST	Journal of Information Systems and Telecommunications
KPI	Key Performance Indicator
MICT	Media, Information and Communication Technologies
MPCCs	Multi-Purpose Community Centres
MTSF	Medium Term Strategic Framework
NEMISA	National Electronic Media Institute of South Africa
NDP	National Development Plan
NGO	Non-Governmental Organisation

NPO	Non Profit Organisations
SA	South Africa
SDG	Sustainable Development Goals
SEDA	Small Enterprise Development Agency
SETA	Sector Education and Training Authority
SME	Small and Medium Enterprises
Stats SA	Statistics South Africa
TV	Television
TVET	Technical and Vocational Education and Training
UN	United Nations
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNSDGs	United Nations Sustainable Development Group
UN SDG 8	United Nations Sustainable Development Goal 8
UoTs	University of Technologies
USAID	United States Agency for International Development
USSASA	Universal Service and Access Agency of South Africa
WEF	World Economic Forum


Chapter 1
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CHAPTER 1. INTRODUCTION

1.1 PURPOSE OF THE STUDY

This master's research is a qualitative study using the case study method to explore the influence of the National Electronic Media Institute of South Africa (NEMISA)'s digital literacy as part of a skills programme and its effectiveness in targeted marginalised communities.

The next section of this research study will focus on the background and context of this study.

1.2 BACKGROUND OF THE STUDY

1.2.1 NEMISA Background

The study focuses on the National Electronic Media Institute of South Africa (NEMISA). This not-for-profit institution established in 1998 was initiated by government with the core purpose of being an education, learning and technical skills centre for the television, radio and broadcasting industries. It was primarily a dedicated institution of the previously named Department of Communication (DoC) and subsequently derives its mandate from now named the Department of Communication and Digital Technologies (DCDT).The aim of this institution upon inception was to train previously disadvantaged individuals and to equip them to participate meaningfully in the broadcasting media landscape. Disadvantaged individuals included those who are negatively impacted economically, with a disability or excluded due to gender (NEMISA, 2022).

NEMISA (2007) Strategic plan outlines the important role NEMISA should play:

To make NEMISA the South African Government's electronic content development centre.

NEMISA's mission is to contribute to socio-economic development by leveraging modern Information Communication Technology (ICT) while improving service delivery and competitiveness through ICT and they aim to advance human capacity in e-skills (National Government, 2021). It has received support from national departments in the fulfilment of

digital literacy and ICT capacity-building programmes, hence the reason why this topic was chosen as a case study.

NEMISA has various academic research hubs, attached to universities/universities of technology (UoTs) that engage in research projects on ICT literacy in their regions and communities. NEMISA also runs multiple courses focused on film, production, radio, interactive media, animation and graphic design. According to Vaal University of Technology (2022), NEMISA aims to empower 21 million citizens with basic e-literacy skills by 2030. Vaal University is one of the seven Collaborative Laboritries (CoLabs) and their specific focus is e-Skills while the other CoLabs across the country focus on other subjects of research. Digital literacy, as the key focus of this study, is delivered over five days with the following objectives:

- Knowledge and skills for people entering the digital space;
- Empowering people entering the digital space comfortably and confidently to operate in the digital space; and
- Respond to the challenges of the economic environment.

The Digital Literacy Programme has the following as key curriculum items and key outcomes:

Table 1.1: Digital Literacy Programme

Structure of Programme	Delivery Mode	Purpose	Outcomes	Cost
Five Day Training	Face to Face Online	Delivering knowledge and skills to enter the Digital Literacy space. Empower participants with knowledge comfortably and confidently to operate in the Digital Literacy Environment SA.	The Internet Cloud Storage Social Media & Blogging Mail & Messaging Digital Awareness: Information Ethics	Free

		Respond to the challenges of the economic environment		

1.2.2 South African Context

South Africa is a country characterised by a growing digital divide in the fourth industrial revolution caused by legacy issues of apartheid and this has an impact on the future of the residents in terms of the future of work in this digital economy (UNDP, 2019). High poverty at 40 per cent and unemployment at 29 per cent (Stats SA, 2020) illustrate the constraints currently faced by South Africa within a spiralling rate of change in technology in the global context which makes it a much more complex exercise to ensure that the necessary measures are in place to upskill citizens to participate meaningfully in the new digital economy (UNDP, 2019).

Unemployment is influenced by multiple factors with one of these factors being an oversupply of low-skilled labour which is due to low investment in education (GCIS, 2022). This further elucidates the mismatch between the demand for skills in the marketplace versus the availability of resources to employ. The cause of low levels of skills to match demand also illustrates the misalignment between education institutions, policymakers and employers to ensure a sturdy pipeline to meet the skills demand for a changing skills environment.

According to the Government Communication Information System (GCIS) (2022), to close the skills gap that exists Government has intervened by instituting Technical and Vocational Education and Training Institutions (TVETs) and colleges to expedite the closure of this gap. The objective is aligned with the National Development Plan (NDP) 2030 to decrease unemployment by 6 per cent which also aligns with Priority 2 of MTSF 2019-2024 IN the NDP Vision 2030 (DSI, 2021):

- To increase the contribution of the digital economy to Gross Domestic Product (GDP) through 4IR.

The current overall labour supply is more than the demand, leading to the perception that there can never be sufficient work in the formal economy to accommodate all the unemployed (GCIS, 2022). This means that even if you increase the number of graduates through various tertiary institutions such as universities, colleges and TVETs, the viability of the graduates is limited by the number of opportunities that exist in the marketplace. Therefore, the curricula that students undergo must be geared towards equipping them to take advantage of the opportunities presented by digital technologies and furthermore the i entrepreneurial opportunities they present. They can thereby become employers and leverage various digital platforms that have changed models of generating income in the digital economy.

Figure 1.1 below depicts South Africa's (SA) employment statistics between 1994 and 2018.

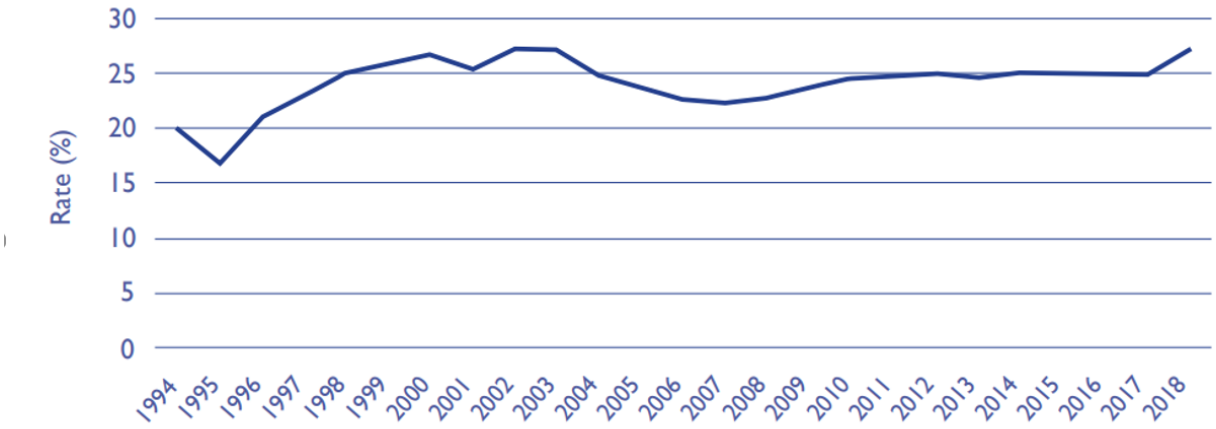


Figure 1.1: SA Employment Statistics 1994-2018

Source: Statistics South Africa

According to Statistics SA (2018), South Africa's unemployment rate has increased from 1994 to 2018. This is an alarming statistic given that post the apartheid era, more people have had more opportunities to study than before. Many students have gone through tertiary institutions and global organisations have also been investing in setting up local representation.

According to NEMISA (2017), 59 per cent of unemployed youths in South Africa had an education level below matric. As these figures indicate, the widening gap between those

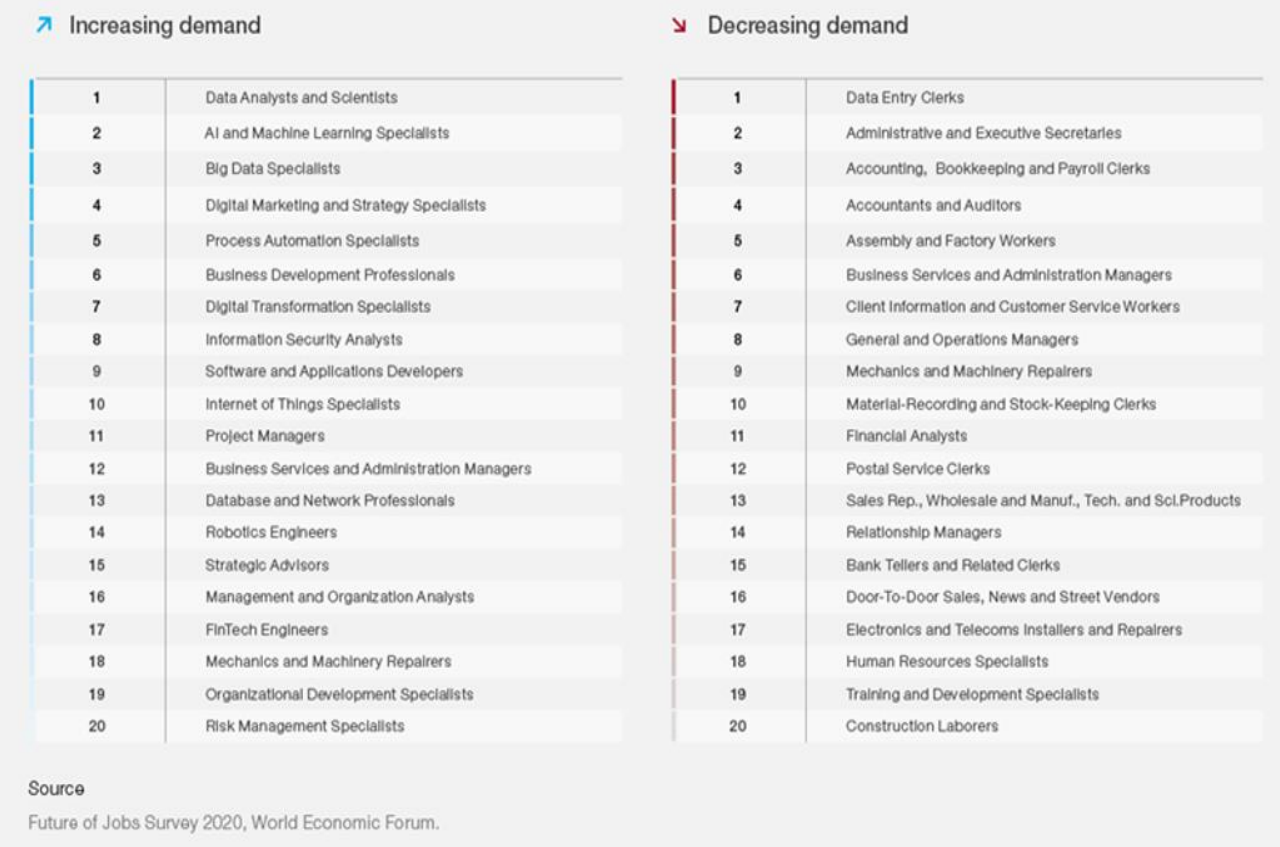
educated with basic literacy skills versus those that drop out of the educational system places further pressure on the education system to produce graduates that are prepared for the world of work.

Furthermore, the workplace of the future which the new entrants into the workforce are being prepared for is laden with technological advancements and trends which are constantly evolving. A study conducted by Alexander et ,al. (2011) for students enrolled in technologies studies found that liking of the subject influenced the choice of professional endeavour. New technologies have impacted the type of career choices that people can select due to either newer technologies being introduced for better efficiencies and productivity or entirely new occupations. Most of the work environments in every industry use technology to leverage these efficiencies, in particular, bridging the communication barriers. This is through applications such as e-mails, instant chats and other virtual communications platforms.

Due to the impact of Corona Virus (Covid-19), Governments had to enforce school closures leading countries off track from achieving the anticipated learning goals (WEF, 2020). Covid-19 has also had an impact on how individuals have embarked on learning in this environment. Data retrieved from the online platform Coursera reveals that there is increased demand for learner reskilling and upskilling and content such as personal development and self-management skills are pivotal post-COVID-19 (WEF, 2022). A clear distinction is made between employed learners and the unemployed as those in employment have a preference for personal development courses and the unemployed prefer learning digital skills such as data analysis, computer science and information technology (WEF, 2021). There is an increasing realisation that to improve one's economic viability, ongoing and self-directed learning will hold the key to a prosperous economic future. Platforms such as Coursera have accelerated access to educating oneself outside of the normal classroom context and broaden the possibility for ongoing lifelong learning.

The democratisation of learning and education, evolution of technologies and the ability to learn new skills in a short span has led to the redefinition of roles in some instances and new career paths which were not there before (WEF, 2020). ICT is leveraged for faster processing of manual tasks, people are also needed for the human interaction element to supplement the technology efficiencies. However, these exist in tandem and some cases human intervention is required; thereby emphasising technical abilities as well as people

skills to be astute in this new world of work.. Figure 1.2 below depicts the roles that are impacted by ICT and whether there is increasing demand or decreasing demand due to this effect.



Increasing demand		Decreasing demand	
1	Data Analysts and Scientists	1	Data Entry Clerks
2	AI and Machine Learning Specialists	2	Administrative and Executive Secretaries
3	Big Data Specialists	3	Accounting, Bookkeeping and Payroll Clerks
4	Digital Marketing and Strategy Specialists	4	Accountants and Auditors
5	Process Automation Specialists	5	Assembly and Factory Workers
6	Business Development Professionals	6	Business Services and Administration Managers
7	Digital Transformation Specialists	7	Client Information and Customer Service Workers
8	Information Security Analysts	8	General and Operations Managers
9	Software and Applications Developers	9	Mechanics and Machinery Repairers
10	Internet of Things Specialists	10	Material-Recording and Stock-Keeping Clerks
11	Project Managers	11	Financial Analysts
12	Business Services and Administration Managers	12	Postal Service Clerks
13	Database and Network Professionals	13	Sales Rep., Wholesale and Manuf., Tech. and Scl.Products
14	Robotics Engineers	14	Relationship Managers
15	Strategic Advisors	15	Bank Tellers and Related Clerks
16	Management and Organization Analysts	16	Door-To-Door Sales, News and Street Vendors
17	FinTech Engineers	17	Electronics and Telecoms Installers and Repairers
18	Mechanics and Machinery Repairers	18	Human Resources Specialists
19	Organizational Development Specialists	19	Training and Development Specialists
20	Risk Management Specialists	20	Construction Laborers

Source
Future of Jobs Survey 2020, World Economic Forum.

Figure 1.2: List of increasing and decreasing demand job roles

Source: World Economic Forum: The Future of Jobs 2020

According to the World Economic Forum (WEF) (2020) as illustrated in the graphic above, the top 20 job roles in the digital economy are increasing in demand not only globally but this is also the case in South Africa. Most of these roles are dependent on new technologies which are prevalent in the workplace and thus new entrants in the workplace must be digitally literate to take advantage of these opportunities or risk the chance of not being employable due to mismatching the skills demand in the workplace.

According to the UN Social Development Goals (UNDP, 2022), ICT can contribute to the development goal by accelerating SDG target 4.4 digital literacy, which focuses on relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship among the youth and adults. Countries are urged to track the percentage

of youths and adults who have achieved at least a minimum level of proficiency in digital literacy skills (UNESCO, 2018).

South Africa's youth unemployment rate for youths between the ages of 15 to 34 years is 36.1% (GCIS, 2022). This statistic highlights the loss of a viable workforce who are either unable to participate in the economy or not skilled enough to take advantage of opportunities presented by developments in ICT. With the older generation of people harder to train in new skills, there is an untapped potential to leverage the unutilised strengths and creativity that are latent in this group between the age of 15-34, who generally pick up skills faster.

According to Comptia (2022), the following are the top five ICT skills required for the year 2022:

- Networking
- Cloud Computing
- Technical Support
- Linux
- Programming Languages

The National Digital and Future Skills Strategy (Department of Communication & Digital Technologies, 2020) was published in 2020 as a guide and vision statement for addressing South Africa's digital literacy and advancing digital skills to meet the changes in the job market due to technological evolution. It aims to build a coherent and nationwide approach and definitive goal with regard to a diverse digital skills base. This is aimed at creating an equal society and driving job creation and most importantly to stimulate better economic conditions (Department of Communications & Digital Technologies, 2020). This strategy document is focused on three strategic pillars that will underpin the targeted direction that government wants to embark on, and these are as follows:

1. A diverse skillset;
2. Priority skills area; and
3. Convergence of digital skills with subject matter experts.

South Africa's Broadband Policy, called SA Broadband Connect, was launched in 2016, aimed at the achievement of the NDP objective of leveraging ICT to create an inclusive and

equal society. It is based on a vision to model and plan toward a world-class open-access national broadband network and harnessing public and private sector (Department of Communication, 2014) contributions, capabilities and resources which were adopted to drive the use of ICT for creating a society that not only benefits from ICT but drives South Africa to be an active player in the knowledge economy.

Its pillars were to achieve the following key objectives:

1. Affordable and ubiquitous broadband access;
2. Policy and regulatory conditions that enable investments;
3. Efficient public sector service delivery;
4. Public and private sector exploitation of ICT for innovative solutions;
5. Strong national skills base focused on skills and institutional capability;
6. Research and development, innovation and entrepreneurship as well as content and applications; and
7. Vibrant creative software industry.

South African government stakeholders commitment to achieving the goals that are expected for a digitally literate society and to expanding the skills to leverage the fourth industrial revolution include NEMISA, the Department of Basic Education, Department of Communication, Department of Labour and the Sector Education and Training Authorities (SETAs). The underpinning principles of aligning these entities are to enhance the quality of life, improve education and achieve higher economic growth.

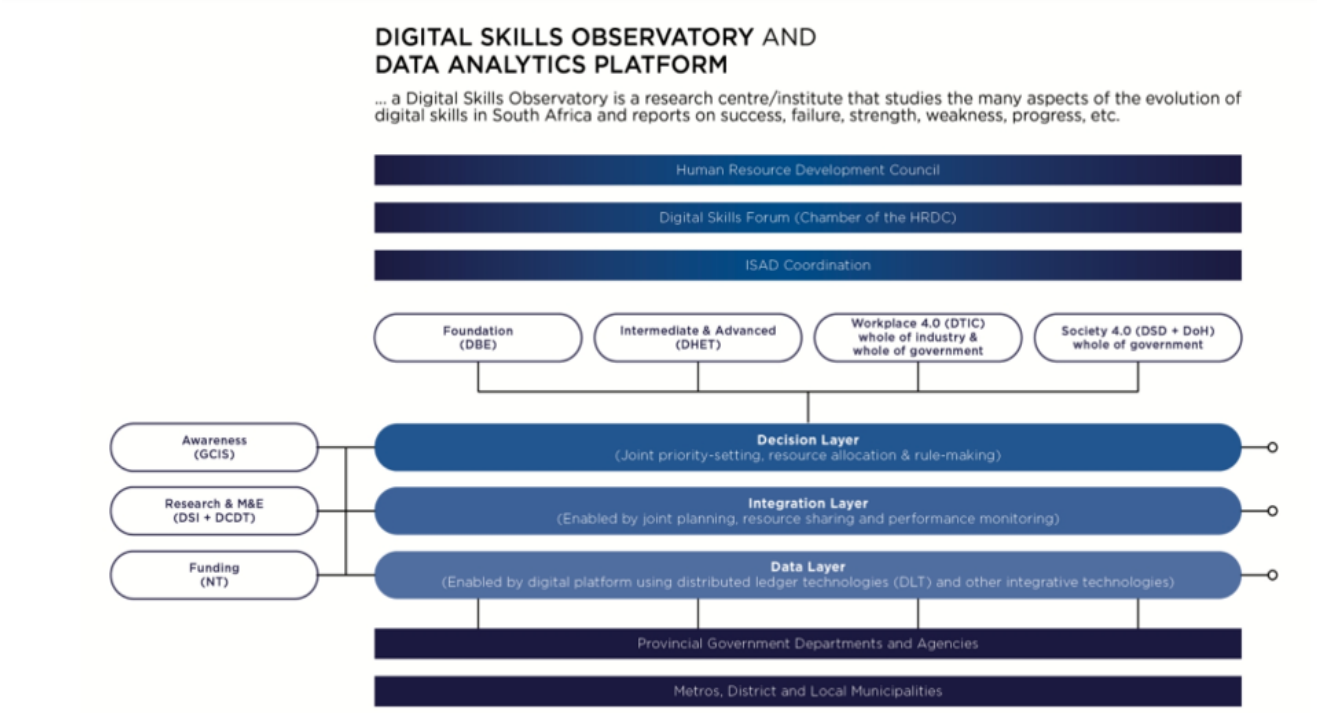


FIGURE 1.3 Institutional design for the digital skills development programme implementation platform

Source: Digital Skills Forum Terms of Reference

Figure 1.3 Above illustrates an innovative approach for the National Digital and Future Skills Strategy Programme, to utilise a data-driven platform that can access data from various databases and draw insights into the needs of young people from a skills perspective (South African Government, 2022). The multi-stakeholders involved in this programme are also depicted and the anticipation is that there will be cross-pollination and visibility of data across the various stakeholders to ensure holistic data-driven decisioning on the needs of the youth.

ICT inclusivity and equity will enable connectedness that permeates economic relations in trade, finance, investment and global organisations of production (Wangwe, 2007). Furthermore, these lead to vast economic productivity due to rapid technological advances across industries and countries because of the efficiencies provisioned by ICT. Wangwe (2007) explains that the ability of ICT to be customisable to the local needs of society as ICT strategy could align with the objectives of achieving the national objectives. In Education benefits such as methods and speed of acquiring information and knowledge, e-education and new ways of learning across countries and sectors; Economic benefits such as production and the organisation of the production process and thereby resulting in wealth creation (Wangwe, 2007).

Digital literacy and skills remain a challenge as the introduction of programmes to upskill those who are teachers or skills centres are usually lagging behind developmental needs. In some cases, the trainers also still need basic training to be able to then train others. Skills centres are unable to cater for a growing population and can cater only for a few people in a community, meaning the intended impact of these is not always enjoyed by all.

COVID-19, a pandemic that hit global society in March 2020, challenged many governments, private companies, livelihoods, education institutions and lives. The impact of this pandemic led to the acceleration of digital tools to deliver learning in the education sector and due to lockdown restrictions, attendance at schools, lectures and conferences was disallowed. This led to alternative means of delivering classes, course content and educational seminars through various means of technology. Various factors impacted the effectiveness of this method and amongst those is accessibility to the internet and digital literacy to be able to utilise the technology solutions provisioned to deliver this solution at such a critical time in the global economy. According to Hanekom (2020), 68.4% of students reported experiencing difficulties adapting to online learning.

ICT can have a direct impact on efforts to improve people's lives through better information flows. Literacy enables individuals to achieve their goals and develop their knowledge and potential, and participate fully in their community and wider society (UNESCO, 2005). Abdel-Aziz et ,al. (216) asserts that digital communication has become essential for people to earn a living and learn, and access other services such as spending and saving, while it is also used to stay informed, and connected and to access health, welfare and other public services.

1.3 RESEARCH PROBLEM

The World Economic Forum's (2016) ranking of the education systems globally ranks the South African education system in its entirety as the third lowest. According to the African Digitalisation Maturity Report (2017), South Africa has been ranked as the country with the highest digital literacy in Africa when compared to Nigeria, Kenya and Ethiopia; however, this report goes on to state that the indices used, South Africa scored lowest in terms of Digital Training .

This represents a critical challenge to the country's desire to be a leading economy in Africa and overcome the legacies of inequality that pervades society, to eradicate access barriers to basic services, skills training and employment opportunities due to the apartheid era legacy (Groener, 2014). On the one side, South Africa is a colossus on the African continent as an information-integrated society (Bornman, 2015), however having to deal with a populace that is not digitally literate means that in certain learning contexts, learning may not be optimal (Barlow-Jones & Van Der Westhuizen, 2011).

1.3.1 Digital illiteracy is a barrier to employability

According to Statistics South Africa (2021), the employment rate in South Africa for the first quarter was 32.6%. The evolution of industries and how this has impacted the world of work and the future of work cannot be underestimated. Chetty et al. (2017) postulate that digital literacy has become a minimum requirement in this new world of work. Unemployment is prevalent in rural and township areas in South Africa as the residents do not have skills in utilising ICT and this means they and others who are not in education, employment or training, cannot effectively participate in economic activities (Matli & Ngoepe, 2020).

The Statistics of South Africa General Housing Survey (2020) reports that 12 per cent of the population below the age of 60 and between the ages of 20-60 are illiterate. This signifies the extent of the working-age population who are not empowered to be successful in the digital economy. Statistics SA (2021) shows that while unemployment for unskilled labour increased, jobs in technical fields and professional roles have actually increased in terms of employment uptake. Nevertheless, of greater concern is the continuous average increase of 2.5% annually in the country's unemployment rate (Statistics South Africa, 2021).

UNESCO (2018) defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes competencies that are variously referred to as computer literacy, ICT literacy, information literacy and media literacy (UNICEF, 2019).

Technology rates of change and the growing use of ICT in the mainstream economy of countries have implications on the business opportunities, jobs and skill sets that citizens are able to pursue. Governments need to implement plans that ensure that their citizens are well equipped to handle this digital future to remain competitive as a country but also ensure that people's livelihoods are sustainable, and opportunities caused by technological change are used effectively.

1.3.2 Digital literacy improves employment viability

Digital literacy is being recognised as a keystone for civic engagement, educational success, and economic growth and innovation (Clark &Visser, 2011). One of the key milestones is the NEMISA and Coursera online training opportunity which will offer 60 000 individuals e-learning opportunities to further their growth (Ndabeni-Abrahams, 2021). While this aligns with the developmental goals of upskilling more people digitally, the ability to have access to these sorts of programmes for the four million unemployed means that only those with the economic means of procuring data and having access to computers were able to participate in such programmes.

According to UNESCO (2011), digital literacy improves employability as employers are looking for candidates who demonstrate basic ICT skills. The value in ICT can only be derived if people acquire the knowledge and skill to be able to use it but more importantly to be able to access it. Employers are looking for employees who will easily adapt to a digital environment and who can keep up with the changes and speed of delivery required to remain competitive in this digital economy. Figure 1.4 below illustrates the key skills that employers value in the workplace. As depicted critical thinking and analysis is a key skill supplemented by problem solving in contrast physical activities are diminishing in terms of demand as technology has replaces more physical labour type of work (WEF, 2020).

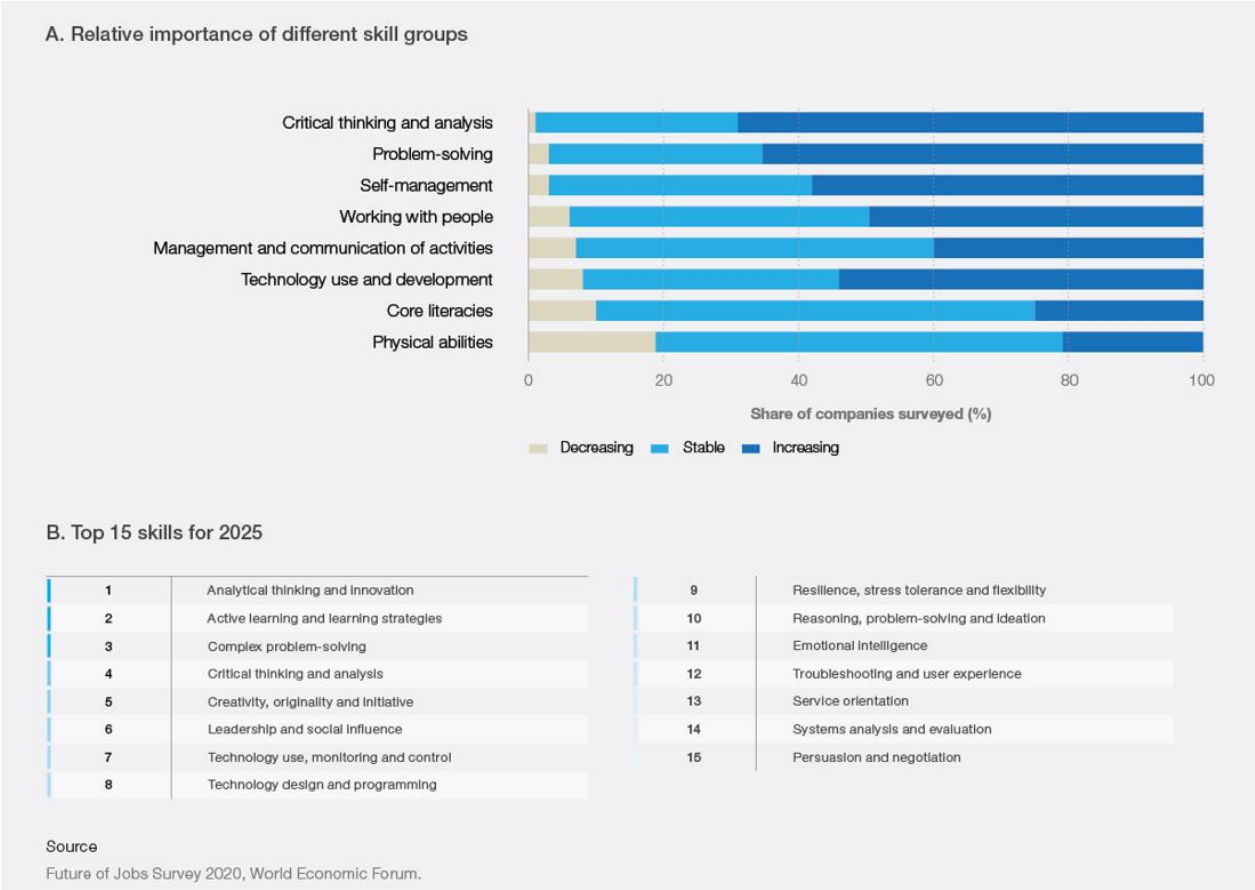


Figure 1.4: Growing demand for skills by 2025

Source: World Economic Forum: The Future of Jobs Report 2020

Without digital literacy, individuals are unable to take advantage of the opportunities presented by ICT developments. South Africa ranks 88th on the WEF Human Capital report out of 130 countries (WEF, 2017). This report measures how countries are developing human capital resources. South Africa, therefore, faces the challenge of producing students and learners who are not matching the quality of skills required for the workplace or graduates who lack the practical experience required to thrive in the workplace.

This research aims to unpack and diagnose whether the efforts of the South African Government's ICT initiatives in the communities are yielding the expected effect on ICT digital literacy, usability and appropriation. The research also aims to explore how the government-led initiatives can be better leveraged to include other non-mainstream skills development opportunities using ICT. Another outcome of this research should be to

understand how Government-led initiatives can stimulate community-led ICT intervention initiatives.

1.4 RESEARCH QUESTIONS

Based on the research problem above the following research questions were explored:

- What has been the influence of NEMISA's digital literacy programmes in beneficiary communities?
- How has access to NEMISA's digital literacy programme improved economic and job opportunities?
- What further digital literacy learning has been activated beyond NEMISA programmes in beneficiary communities?

1.5 SIGNIFICANCE OF THE STUDY

The development of advanced digital skills involves a range of areas of activity and multi-stakeholder collaboration which includes the Department of Higher Education and Training, TVET institutions, universities and other institutions involved in post-school education, technology and innovation; and the Department of Communications and Digital Technologies to promote the digital and future skills strategy (Department of Communications and Digital Technologies, 2020). Digital literacy for all the citizens of South Africa to participate in the digital age is required as an elaborate drive for skills development. This research thus aims to provide a practical contribution to the vision of the Department of Communication and Digital Technologies.

Table 1.2: Stakeholders and significance of the study

Stakeholder	Role and Significance of the study
Students	Increasing uptake of digital literacy course and further digital skills development through lifelong learning.
Employers	Align uptake of interns, internships and employees in line with the digital skills development plan as outlined in the DCDT Future skills strategy
Policy makers	Policies that foster collaboration in the roll out of digital literacy initiatives and coordinated projects approach across all stakeholders that improve the impact in marginalised communities .
Training Institution	Development of curriculum that is agile to changing needs and adoption of tools that are accommodative across differing economic levels, cultures and languages of learners.
Skills Centres	Development of ecosystems and hubs that can assist with localised access to information, tools and training to improve economic opportunity for learners.
Educators	Development of well-trained educators who are able to be fully engaged to deliver key digital skills through multi modal mediums that meet the future skills gap.
Private Sector	Collaborating effectively with Government to address skills shortage, develop digital literacy initiatives and provisioning on the job training, apprenticeships and learnerships that will achieve Digital Literacy initiatives.
International Organisations	Providing a guideline for effective roll out of digital literacy initiatives and alignment with national initiatives and programmes.

Table 1.2 Above illustrates the significance of the proposed research and the value to the education sector as it pertains to students, training institutions, educators and policy makers

with insights into rolling out of well-designed digital literacy programmes and then developing digital competencies students and educators effectively. This will also ensure that curriculum designed for the uptake of digital literacy curriculum can take into considerations the effectiveness of training and development programmes in economic development and lifelong learning.

The benefit to policy makers involved in education across the various levels is that additional insight will be derived for effective ICT and education policies, alignment of various stakeholders involved in the roll out similar initiatives and to improvement learning quality through a coherent ecosystem that is aligned with the corporate and public sector needs.

Other stakeholders such as the private sector can benefit with ensuring that the demands of the fourth industrial revolution are articulated for training institutions, education institutions and potential employment candidates so that there is alignment between industry requirements as well as the pipeline of potential employees. Private sector can also assist with on the job training, learnerships and internships that can extend the impact of digital literacy initiatives in alignment with the DCDT future skills strategy.

1.6 DELIMITATIONS OF THE STUDY

The proposed research study has the following delimitations:

1. This study is limited to a South African context and the scope of students based in South Africa.
2. A qualitative research method was utilised, due to its merit of being used to provide more depth and breadth to the proposed topic.
3. The South Africa e-skilling initiatives are limited to projects run by NEMISA and not any other entity.

1.7 DEFINITION OF TERMS

The table below defines the relevant terms for the study.

Table 1.3: Definition of Terms

ICT4D –	Information Communication Technology for Development. (Heeks, 2010)
Co-Labs	Collaborative Labs are entities aligned to aligned to an entity to provide dissemination transmission of knowledge by focusing on own agends (Agencia Nacional De Inovacao, 2022)
Digital literacy-	Those capabilities which fit an individual for living, learning and working in a digital society (Jisc, 2014)
e-Citizenship	The competent and positive engagement with digital technologies (Council of Europe Portal, 2022)
e-Learning /e-Education	Learning conducted using technological platforms such as web application (WEF, 2021).
eGovernment	The provisioning of government services using ICTs (The World Bank, 2015)
eCommerce	Economic Activity conducted using electronic connections(Wigand, 1997)
Gig economy	Exchange of labour for money between individuals or companies using digital platform (WEF, 2021)
Digital Skills/e-Skills	A range of abilities to use digital devices, communication, applications and networks to

	access and manage information (UNESCO, 2018).
Digital Divide	Term use to describe difference between those with access to the internet and digital technologies versus those who do not. (UNESCO, 2018)

1.8 ASSUMPTIONS

The following assumptions were made by the researcher in the proposed study:

1. The study can provide insight to NEMISA authorities and the national government to enhance digital literacy and digital learning programmes for students and the general community.
2. Users could be biased in their responses, given that the questions may pertain to areas where they wanted to feel socially included.
3. The sample of students crosses diverse ethnic backgrounds, inclusive of both genders and different socio-economic standings.
4. All respondents are proficient in the English language.

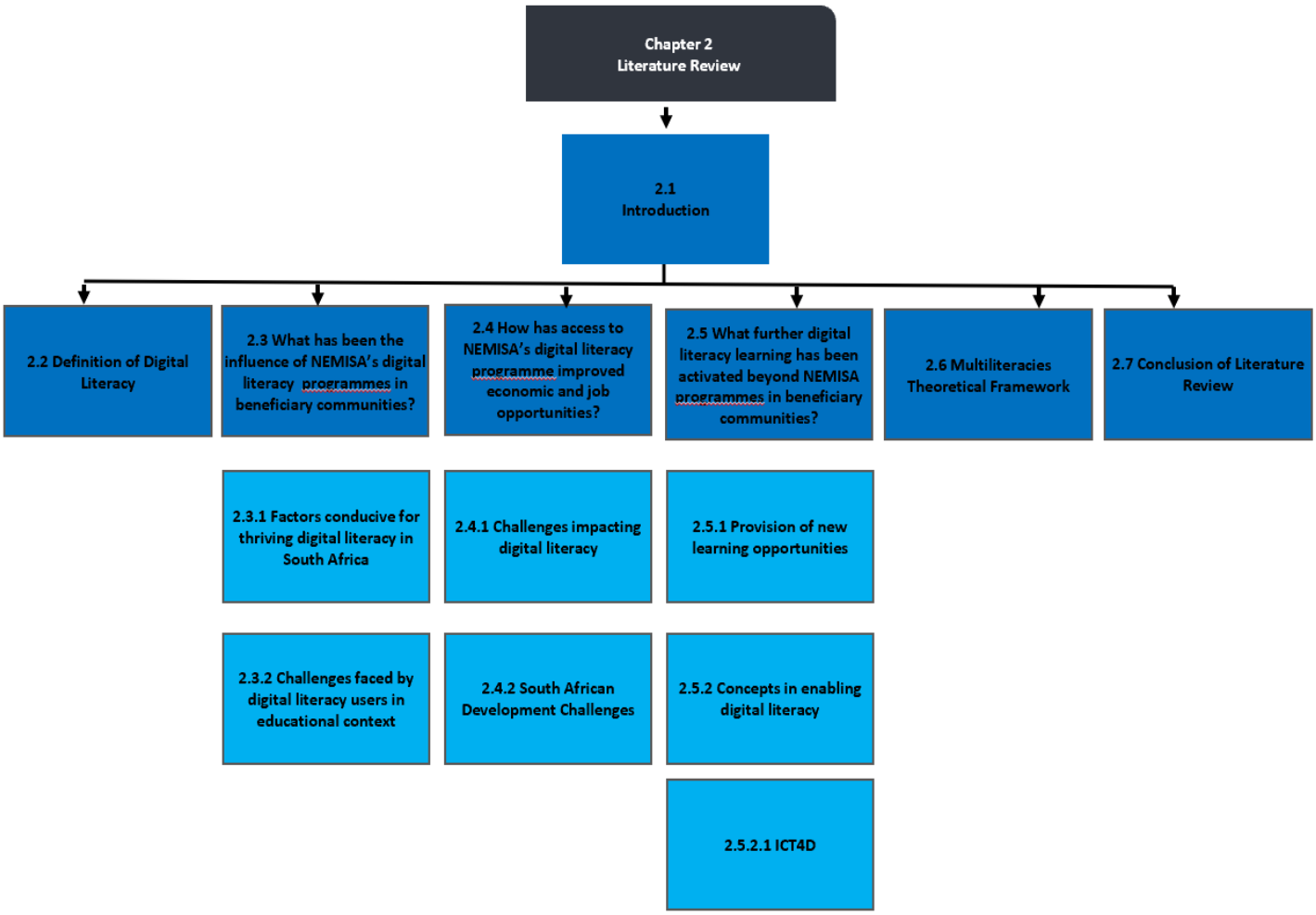
1.9 CONCLUSION

NEMISA has been essential in the provision of educational opportunities in the media and television industry for previously disadvantaged communities. With the evolution of and convergence of technologies in the fourth industrial revolution, traditional industries such as television and radio are evolving and newer industries are becoming preeminent in particular the ICT industry. NEMISA's mandate has thus evolved to ensure that the marginalised are offered equal opportunities to participate and benefit from the opportunities provided by the digital revolution. To facilitate access for the marginalised NEMISA delivers a 5-day digital literacy programme as an access opportunity to expose learners to opportunities that technology provides.

South Africa is faced with multiple challenges as it relates to poverty and unemployment and the velocity at which technology is evolving neither of the two is likely to decrease unless

the necessary measures are in place to upskill citizens to participate meaningfully in the new digital economy. Unemployment due to low-skilled labour as well as deteriorating education levels further widens the gap in terms of demand for skills in the marketplace versus the availability of skilled resources to deliver on this demand. The South African Governments response to this has been the National Digital and Future Skills Strategy Programme aimed at ensuring the Future Skills development of the country is aligned with the evolving technologies and needs for skilled labour in particular for the youth.

Digital literacy as a point of entry can provide for citizens to access, manage, understand, integrate, communicate, evaluate and create content safely through digital technologies which can assist with the application for employment and entrepreneurship. With the growing use of ICT in various industries of the economy, the implications on the business opportunities, jobs and skill sets are that people need to be able to use technology effectively. Ensuring that citizens are well equipped to handle the evolution of technologies is essential for all stakeholders in ensuring the competitiveness of a country.


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CHAPTER 2. LITERATURE REVIEW

2.1 INTRODUCTION

According to Ramdhani et al. (2014), the purpose of a literature review is to address the need to critique, reconceptualise or expand a diverse knowledge base as the topic undergoes further development. A literature review assists the researcher in relating the subject being studied to existing knowledge. This can provide a composite view of the depth and content of study that the subject has received from previous research and also assist in identifying what the existing gaps in knowledge are thereby ensuring that the researcher can be more definitive in terms of what areas are still to be addressed (Snyder, 2019).

The researcher undertook this literature review to map out and analyse existing theory in order to provide motivation for this study to be undertaken. This chapter will cover the depth of digital literacy, its definition and trends. The studyalso be focused on sharing existing knowledge as it related to the influence of digital literacy as it alignment to research objectives and identify any possible gaps, in theory, to therefore inform any future research that can be undertaken.

2.2 DEFINITION DIGITAL LITERACY

Voogt et al.'s (2011) view of digital literacy is that it is an interplay between technology and society to understand the technological principles needed to develop a relevant solution and achieve goals. Martin (2006) elaborates thatthat digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions and communicate with others in the context of specific life situations, in order to enable constructive action, and to reflect upon this process".

Joint Information Systems Committee (JISC) (2014) postulates that digital literacy is beyond just the use of digital tools; rather its depth includes the behaviours and practices in digital settings. According to JISC (2014), the following capabilities are the seven elements of digital literacies:

1. Communication and collaboration
2. Career and identity management
3. ICT literacy
4. Learning skills
5. Digital scholarship
6. Information literacy
7. Media literacy

Martin (2006) elucidates on digital literacy, building on the foundational skills of reading and general literacy in order to provide people with an understanding of digital technology and its effective use. Skills sets such as critical thinking, assessment of information and the ability to use various devices and the ability to assimilating topics such as data privacy, are key in the digital society we now live in.

ICT is an enabler for access to information (Heeks, 2010) and thus this makes it central to the digital literacy theme. According to Heeks (2010), it is also a driver of participation, a feeling of involvement and active engagement. It helps people feel connected to the world through the gathering and assimilation of news and events. Information is consumed in multiple ways via television, radio, mobile devices, internet browsing and social media. Heeks (2010) supports this statement by positing ICT as a valuable vehicle for various employment opportunities for the poor and to promote sustainable human development. ICT is an enabler for the transfer and absorption of knowledge. Martins (2006) assert that access to ICT is a requirement for social and economic development. ICT has had a profound effect on all phases of life, can assist with improving educational systems and has impacted everything we do at work, at home or at school (Alhumaid, 2019).

Gilster (1997), a notable contemporary on the subject of digital literacy, positioned digital literacy as being about the mastering of ideas and not of keystrokes. He defined digital literacy as the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. Moreover, Hull (2003) notes new technologies as new types of literacies. Bawden (2008) on the other hand has the view that digital literacy can be observed on a continuum, evolving from computer literacy to newer forms of literacies such as information literacy, internet literacy, web literacy and digital literacy. UNESCO's (2013) definition of digital literacy states that it is the ability to use digital

technology, communication tools or networks to locate, evaluate, use and create information. It also refers to the ability to understand and use information in multiple formats from a wide range of sources when presented via computers, or a person's ability to perform tasks effectively in a digital environment (McGuiness & Fulton, 2016).

Other scholars such as Pangrazio (2014) on the topic of digital literacy, note the difficulty of defining digital literacy indefinitely due to the evolving nature of technology while others such as Lankshear and Knobel (2008) elucidate the dichotomy of skills or a broader competence-related view. Digital literacy can be seen as an combination of information and technology literacies. Lynch (2017) presents four pillars that make digital literacy principles; that is the technology skills to be able to use ICT technology, the authorship skills which are based on the ability to use ICT to create, representation rules and online social responsibility which includes the ability to understand the threats that are posed by usage of ICT technology and accessing the internet.

Digital literacy is an important skill in this digital era for people to live, learn and work due to information increasingly being accessed using newer technology platforms such as the internet, social media platforms and mobile devices (JISC, 2014). Concepts such as globalisation, information society, eGovernment, and eCommerce are major proponents of digital literacy and the empowerment of the masses to generate a workforce for economic development and other social development. Applying key skills such as critical thinking, communication, practical skills as well as professional skills in an evolving digital workplace are key skills in the digital era.

Pangrazio et al. (2021) posit that digital literacy is foundational in digital citizenship. Technology has enabled mobility and a more conducive civic engagement. With the development of e-government platforms, citizens are able to access government services much more easily and keeping abreast of any civic matters is also easier. However,, the value that can be derived poses a risk for those not well attuned with digital literacy skills as they may either be left out or exposed to dangers such as data privacy, or copyright infringements. Irresponsible use of technologies, for example, cyberbullying on social media is a testament to the digital literacy gaps that still permeate our society.

Cole (2019) posits that the value of digital literacy is a vital cog in driving lifelong learning which is an essential life skill in a digital society driven by massive data generation and having to navigate this data to keep abreast of changes and remain relevant. The use of video, infographics and social media has become prevalent due to digital evolution and that means that beyond reading literacy, these technologies can extend learning beyond the classroom. Other life skills that digital literacy facilitates include critical thinking skills demonstrated by the ability to evaluate credible digital sources and over and above this collaborate with others via collaborative platforms such as Google Docs which in turn helps users to become better communicators (Cole, 2019).

Digital literacy is critical in informing how learning and assessment are administered (Nawaz. Due to the influence of technology in the classrooms, students learning experiences has changed due to the infiltration of digital classrooms (Nawaz & Kundi, 2010) . This has led to students having to be independent when the application of tablets and the ability to have one on one access to teachers leads to a personalised learning experience. The result of this is an increase in independence leading to improved motivation. The students and learner environment would lead to better collaboration between the students and the teachers (Nawaz & Kundi, 2010.

The impact of learning and assessment brought about by technology development has an impact in that policies that influence curriculum definition as the considerations influence learning designand mediums of delivery of learning and education. The challenges include teachers' ability and willingness to use technology to deliver their lessons. Digital literacy becomes very important as without this the anticipated benefits such as better and personalised learning experience will not be yielded. Furthermore, students with limited access and limited connectivity would be impacted negatively as compared to their peers who may have access to these technologies at home giving such students advantage over others.

Technology has also revolutionised the workplace and the evolution of these technologies will have an impact on the future of work. Technologies such as AI, Automation, Robotics and Machine Learning are constant themes in today’s world of work (WEF, 2021). Collaboration platforms such as Microsoft Teams, Zoom and others are now the de-facto standard for the hosting of meetings. The ability to use and interact with these technologies

is a requirement by most employers. Even traditionally non-technology-driven jobs are impacted by newer technologies as most businesses strive to become software businesses and thus manual work is slowly being replaced by technology. Digital literacy is thus an important skill to have in order to be able to confidently navigate this new world of work and to be able to upskill to meet future work demands that require interaction with technology so as not to become redundant.

Schwab (2016) states that the world in the fourth industrial revolution has seen a convergence of various components of human existence. This is exemplified in the automation of manual labour and this has disrupted multiple industries and traditional business models. Technology proliferation in the fourth industrial revolution has been aided by the proliferation of the internet. The ability to use and process digital information to gain valuable insights using the internet is important. This is due to the fact that technologies such as Big Data, Cloud Computing, Artificial Intelligence and Machine Learning have filtered into every area of human existence. Exposure to these technologies impacts every human life which makes it that much more important for individuals to be empowered with digital literacy skills to not only navigate but competently use these technologies to ensure participation in this world.

Mwakatumbula and Moshi (2020) assert that the Gig economy has presented new avenues for job opportunities and entrepreneurship. Unemployment can be attributed to multiple factors however one major contributor is low education levels and skills. Digital technologies provide an alternative to new career opportunities. Platforms such as Uber, have created opportunities for people to make a living by participating in such initiatives even without the limitations of not having academic qualifications. These digital platforms however require a certain level of digital competence in order to be able to perform certain tasks. Digital literacy would provide the foundational skills to be able to take the opportunities presented by the Gig economy ecosystem thereby alleviating the effects of unemployment (Mwakatumbula and Moshi, 2020). This would lead to enhanced economic participation to ensure that economic participation is accessible to most citizens.

Parschau and Hauge (2020) posits that the prevalence of job losses in Africa is due to the impact that the fourth industrial revolution has had. Africa is lagging behind developed

countries in terms of internet access and digital skills . To curb the negative trajectory of the impact of the fourth industrial revolution it is important to improve digital literacy initiatives.

Developed countries' approaches to digital literacy initiatives can provide some insight as to the approaches that can be adopted. In Norway, digital literacy is embraced in their educational policy (Erstad, 2007) and a strong focus on research initiatives on digital technologies has been capacitated extensively. Gundersen (2016) outline the national programme Digidel 2017 with a strong focus on ensuring all citizens spite of their age, gender, location, education or labour participation. The vision of this initiative is to decrease the number of nonusers of the internet and digital tools and increase participation in the fourth industrial revolution. Libraries were seen as central to driving the digital agenda where a citizen could develop their digital literacy skills. In Norway, libraries are being capacitated to promote information proliferation and with the digital revolution, these arenas are seen as vital conduits to drive digital skills.

Some of the Digidel 2017 results include a dedicated website for training resources and guidance for targeted user groups. There are also regional-driven initiatives which gather targeted at training resource providers. One of the other specific outcomes includes a Magazine which is targeted at older citizens to inspire them further in learning digital skills Gundersen (2016).

In Australia, the Australia Qualification Framework has enacted a digital literacy post a review completed in 2019 as an essential skill (Coldwell-Neilson, 2020). This placed digital literacy on par with other literacies ensuring that it is included as a learning outcome to improve graduates' future work prospects. Australia has a national programme called Be Connected aimed at increasing the confidence, digital skills and safety of citizens between the ages of 50 years and older (Australian Government, 2022). This programme has a dedicated website with free resources for support and mentoring. Through the Australian Digital Inclusion Alliance (ADIA), which held its first confinement in 2016, with the aim of creating a collaborative approach between business, government, academia and community organisation. This initiative aims to reduce the digital divide and enable social and economic participation for all Australian Citizens. (AIDA, 2020). This forum has created an overarching roadmap with Government as a key stakeholder focused on three key deliverables:

1. Creating a digital capabilities framework to provide a common understanding of what it means to be a digitally capable individual.
2. Assessing which affordability measures are taken in the immediate response to COVID-19 can be retained going forward.
3. Move towards all federal, state and local government websites being compliant with the latest accessibility standards.

Central to the digital literacy agenda however is the pillar toward digital capabilities. ADIA (2020, p. 8). has focused on having a singular understanding of what it means to be digitally capable and summarising this is the statement below:
"Having the knowledge and confidence to safely, securely and discerningly navigate different devices and the internet. It is a commitment to lifelong learning and adapting to new technologies and platforms."

Though with such progress made ADIA is propositioning a government-led approach whereby all stakeholders can be driven towards a singular driven goal.

Nigeria has also embarked on a programme called School Net (Igbunu, 2020). This project entailed ICT infrastructure roll-out in primary and secondary schooling. However, there are various challenges in ensuring that this project gains the expected results. In one of the findings, Igbunu (2020) found that despite the policy directive by the federal government, financial prioritisation remains an obstacle from a budgeting perspective.Igbunu (2020, p. 17) provides evidence of inconsistent certification requirements for educators being prevalent as per the statement below:

"Most of the states of the nation developed their own ICT education requirements that vary slightly from the Federal Government's, creating disharmony in the education system."

This can be a symptom of non-clear digital literacy objectives and drive and thus leading to various interpretations which further lead to inconsistent application of the intended outcome (Igbunu, 2020). Through one of the initiatives called Feed the Future All-In projects, digital literacy is being taught to rural farmers to improve market access. This project aims to assist farmers in using their mobile phones to access e-commerce.

2.3 WHAT HAS BEEN THE INFLUENCE OF NEMISA'S DIGITAL LITERACY PROGRAMMES IN BENEFICIARY COMMUNITIES?

2.3.1 Factors conducive to thriving digital literacy in South Africa

South Africa ICT in education policy framework which has been in existence since 1996 with the aim of:

- Promoting economic growth, job creation, social development and global competitiveness,
- Linking with Pan African countries to promote e-schooling for Africa's development,
- Education and skills development adaptation at all levels of society,
- Transformation of learning and teaching using ICT formal school and FET college sectors (Isaacs, 2007).

This evolution of the ICT in education policy has seen various initiatives (Isaacs, 2007) such as EDUNET, and e- Education White Paper.

Through the Department of Communication all ICT projects such as USSASA which is responsible for Universal access. This has progressed since the Department of Communication and the Department of Telecommunication have been consolidated into one ministry called the Department of Communication and Digital Technologies (DCDT). Through the DCDT a National Future Skills strategy was enacted by the then Minister Abrams with the objective of focusing efforts on the development of skills focused on meeting 4IR as well as future evolutions of technologies. NEMISA which is an institution reporting to the DCDT is responsible for digital skills training and has been formed initially in 1998 to introduce the marginalised into the broadcast and media industry. However,, through the evolution of technology, the focus is now on 21st-century skills (NEMISA, 2022).

The digital era has brought about tremendous changes to how people interact and process information; information is what drives the era (Corish, 2019). This evolution is both complex and unique in that navigating the triage of information requires an individual to be able to synthesise constantly evolving and rapid information compared to the past. Evolving technology thus has caused digital literacy to be often assumed to only refer to technology skills such as coding and others; however, skills such as reading and writing in the modern era also form part of the digital literacies umbrella as it touches on problem-solving, critical

thinking, design, creation and the ability to leverage text and tools in digital format (Loewus, 2016).

The evolution of literacy from traditional to digital literacy brings about its own challenges; for example, introducing technology as a means of conducting lessons and engaging students has been impacted by the reluctance of teachers to incorporate digital learning in the classroom due to unfamiliarity with technology (Frost & Sullivan, 2019). With this in mind, various initiatives by the government have been undertaken and thus ICT and digital literacy were identified as a core development area for pre-service teachers and ongoing development for practising teachers (Department of Education, 2006).
South Africa is faced with a large deficit of available infrastructure to build e-skills at an education and community level. As a developing country, the legacy of apartheid and reinforced inequality has caused disparities where the wealthy are educated and have access to resources such as ICT while the disadvantaged are increasingly left behind (Van de Berg, 2007). This phenomenon is referred to as the digital divide. Ritzhaupt et al. (2013) further posit that the digital divide includes whether people have the necessary ICT Skills. The World Economic Forum (2016) ranking South Africa as the third lowest in ICT skills indicates a need to improve our education system.

According to Sokolow (2020), 10 per cent of South African homes have computers at home. That leaves up to 90 per cent of homes without the ability to use computers at home and thereby limiting the opportunity to improve digital skills and literacy outside of the classroom. The statistics are synonymous with the disparate access issues due to unequal standards of living which have a negative impact on digital literacy. Manduna (2016) states more succinctly that poorer families are less likely to be digitally literate. The cycle of poverty can be broken through robust digital skills (Chetty et al., 2017) and the levelling of the playing field that can facilitate lifelong learning and economic inclusion (Papadopoulos, 2002).

South Africa's high school education plays a leading role in preparing students for the challenging higher education stream and in preparing students for lifelong learning and the world of work. However, the high schools face challenges of their own; for example, over 100 schools in Gauteng lack internet access (Sokolow, 2020). Kajee and Balfour (2011) refer to the disparate under-resourcing and lack of premeditated support for digital literacy initiatives in the schooling system. Frost and Sullivan (2017) concur with this assertion in

that the use of technology has not been effectively implemented in the South African schooling system. They also highlight that through e-education, South Africa could accelerate equitable literacy because it would lower the cost of access to quality education and the provision of an effective and efficient education curriculum for digital literacy. The value for those in the rural areas is that it would also ensure that they keep on par with their urban compatriots.

2.3.2 Challenges faced by digital literacy users in an educational context

Basargerka and Singhavi (2020) elaborate that reluctance is but one of the two barriers identified as obstacles to adopting digital tools and resources. The other notable barrier is the lack of confidence on the part of teachers and questions about traditional teaching versus teaching in the digital era arise. UNESCO (2011) states that some of the benefits that learners gain include personalised learning and teachers can offer personalised teaching, and better learning processes, including adaptive and interactive learning environments. The other challenge identified is that policymakers have focused on providing infrastructure without training and motivating teachers to use this technology effectively in their attempt to drive the development of digital literacy (UNESCO, 2011).

UNICEF (2022) proposes that innovation in teaching should be more than just new technologies but should include the adoption of newer simplified means to promote lifelong learning and equity. UNICEF identifies four areas where innovation is required:

1. Programmes;
2. Processes;
3. Products and Services; and
4. Partnerships.

Some examples of innovations that can be explored include gamification which leads to immersive and deeper, more personalised and entertaining learning experiences (UNICEF, 2022). The other example is hybrid learning.

Hybrid learning approaches have the potential to transform the delivery of education (Broadband Commission, 2021). Traditional classroom and lecture settings are challenged in the face of accelerated remote learning, which allows learning to happen at any location.

This can assist in cases where there are limitations in terms of space to accommodate a certain number of students. With hybrid learning, learners can access both face to face as well as online learning; thereby exponentially increasing the number of students who can pursue a particular programme.

This transformation of education delivery also has an impact on terms of quality of education. South Africa is plagued by the differing quality of education between private institutions and public schools (Amnesty International, 2020). However, the opportunity provided by ICT is to bridge the divide by making quality educators available and accessible to all students across the board.
Access to quality learning materials is a challenge that hybrid learning can solve (UNESCO, 2020). South Africa has had situations in the past where there was the late delivery of textbooks or in some cases, non-delivery This would lead to certain individuals, particularly in the public schooling system, being disadvantaged compared to their compatriots in private schools.

Teachers in the public schooling system are impacted by a large number of students in the classrooms(Amnesty International, 2020). In the private schooling system, only a certain number of students are allowed per class to allow individualised attention per student. Personalised attention to students in public schools is impractical with teachers having to accommodate in some cases over 40 students per class. Hybrid learning can assist in curbing this situation and allowing personalised learning for students and more importantly, allowing teachers to assist students, especially those deemed to be performing poorly (UNESCO, 2020).

Preparation of learning content can happen before the class and can make use of multimedia content such as videos, graphics and presentations. This can aid in making the learning environment much richer and thus assist students with retention and ease of assimilation of content. In terms of student-centred learning, Hazelkorn and Edwards (2019) further highlight the extent of the possibilities in stating that this presents an opportunity for problem-based learning and students as co-creators of content, making it a much more interactive experience.

Policymakers in South Africa have to grapple with issues of access, equity and inclusion due to the impact of the digital divide in the South African context (WEF, 2021). South Africa has differing needs across multiple provinces, rural areas and metros, gender equity, disabilities as well as issues pertaining to low-income and high-income earners. These all impact the current education at a primary, secondary and tertiary level. Introducing measures to mitigate some of the disparities of access requires user-centric strategies that solve specific use cases.

The UN SDGs call for universal and affordable internet access for all. The internet has become a viable solution to bridging the information divide and has facilitated economic opportunities. To further the digital literacy agenda, it is important to leverage this powerful medium as an enabler for digital economy participation (UNICEF, 2017). South Africa can also leverage mobile phone penetration and partnerships with network providers to further drive the internet usage footprint. That would have implications for how learning using mobile technology to drive digital literacy influences curriculum design and course content.

WEF (2021) further discusses the inequalities in access being caused by gaps in affordability, digital devices and bandwidth; professional development programmes failing to impart the necessary digital skills to support hybrid teaching practice; weak attention to pedagogy and poor lesson design; difficulties in maintaining engagement between teachers and students; potential biases inherent in automated tools that may not be designed with learners in mind; a lack of appropriate learning content; the alienation of educators from the learning process; the replacement of educational institutions with technological fixes; and limited use of hybrid strategies (WEF, 2021).

According to UNICEF (2017) multiple barriers to access to the internet are:

- Affordability due to high costs of technology;
- Connectivity due to inadequate communication networks or infrastructure;
- Literacy due to low levels of basic literacy, reading ability and technical skills;
- Discrimination based on gender, race, ethnicity, age; and
- Inclusivity due to ICT design and user interfaces and other aspects such as language, capacity or disabilities.

Gal-Ezer and Stephenson (2014) posits that the debate of the inconsistency in the administration of computer literacy education. This leads to ineffectiveness due to there being too much focus on technical aspects and less focus on the contextual factors. Furthermore, the computing curriculum of developing and developed countries has distinct differences with some countries focusing on instrumentation and others being more liberal (Gal-Ezer & Stephenson, 2014). Martin and Dunsworth (2007) note that with the advent of technology trends, the revisioning of courses needs to be constant in order to keep up with the evolution of technology.

Nawaz and Kundi (2010) contrast two suggested roles of ICT and digital literacy as proposed by Tinio (2002). The first focuses on three dimensions:

1. Learning about ICT wherein digital literacy is the end goal;
2. Learning with ICT where technologies facilitate learning; and
3. Learning through technologies thereby integrating it into the curriculum.

Sahay (2004) lists four dimensions of computer literacy:

1. ICT as an object;
2. An assisting tool;
3. A medium for teaching and learning; and
4. ICT for education management.

Shahmir et al. (2010) succinctly sums up the role of ICT in digital literacy in that it can play a supplementary role as well as a central role in learning providing cognitive or adaptive tools or systems to support constructivist learning.

Uskov et al. (2019) posit that all universities should become smarter in order to optimise learning. This is in keeping with changing how education and learning are administered. One such innovation of the evolutions of technology is e-learning. E-learning has become prevalent in terms of hardware, software and other varieties of applications in education for teachers, students and administrators (Nawaz & Kundi, 2010). The value of such technological innovations such as e-learning is that not only does it fit multiple applications in school or workplace settings; the use of it also facilitates the learning of both the subject as well as the use of the instrument and furthermore, it presents an opportunity for virtual learning environments serving physically dispersed learners (WEF, 2021) This is beneficial

within the South African context where quality education is not necessarily afforded to all and sundry and the rural settings are normally left behind due to there being few qualified administrators or teachers for technology subjects.

The use of technology in teaching will not have expected value unless the objectives are clearly set and tasks are well designed. Moreover, a study by Alhumaid (2019) sought to identify ways in which technology has negatively changed education. Her study was focusing on technologies such as tablets, internet connectivity, laptops and social media. Her findings confirmed that the following outcomes were some of the impacts of technology on users in education.

1. Deteriorating students' competences of reading and writing,
2. Dehumanizing educational environments,
3. Distorting social interactions between teachers and students

Isolating individuals when using technology

According to WEF (2021), hybrid learning approaches can transform the delivery of education. This is expressed in the magnified use of technology in classrooms with increased virtual learning environments which have also opened entrepreneurial opportunities and cross-border communication like never before. Other innovations include adaptive learning, immersive environments, mobile learning and flipped classrooms (WEF, 2021). Studying and taking courses on online platforms at one's own pace is symbolic of the potential that these new learning platforms provide. This has significantly altered the relationships between teachers and learners, learners and learners leading to much more interactive experiences, personalisation, collaboration, intercultural exchanges, leading to personalised learning journeys and paths. Ways of teaching and learning as proposed by WEF (2021) include:

- AI supports greater reactivity to learning challenges and more personalised learning paths, and learners can cooperate autonomously through interaction on digital platforms enabling shared online writing.
- Approaches to learning, enabling customisation and providing instant, real-time and sometimes more detailed and accurate feedback to learners.
- Learning content and resources open up knowledge that was once inaccessible.

Therefore, traditional approaches to teaching, learning and literacy are inadequate to address the challenges of today. The cultural diversity and multi-modal platforms of today

require a rethink of how key life skills such as digital literacy can be taught taking into account the context of individuals it seeks to empower.

2.4 HOW HAS ACCESS TO NEMISA'S DIGITAL LITERACY PROGRAM*ME* IMPROVED ECONOMIC AND JOB OPPORTUNITIES?

2.4.1 Challenges impacting digital literacy

South Africa should focus on improving the digital literacy of people online regardless of skill level, age, gender or education. By actively facilitating them through the phases of exploring and participation, people can be turned into engaged information society citizens who gain the benefits of creating and yielding value in the new information society (Surman et al., 2014). Policymakers whose role is to yield the benefits should design digital inclusion initiatives promoting diversity in media ownership and expanding digital literacy while teaching participants to create meaningful content.

South Africa ranked 33rd out of 46 countries for a f of data (Chinembiri, 2020). The report also noted that poverty can be cited as an issue as well as digital illiteracy. The digital divide due to income disparities is a growing concern with South Africa being one of the most uneven societies globally. The higher-income earners are able to access digital technologies and thus are exposed to better work and economic opportunities while on the other extreme, the low-income earners struggle with basic digital literacy. According to Manduna (2016), the poorer a family is, the less likely it is to be digitally literate.

To exacerbate the digital literacy complexity, South Africa has a historical legacy of marginalisation (Martindale, 2002). The country has to consider the legacy of the unbalanced education systems of the past which has left many unskilled and illiterate, struggling with the social effects of the language policies. This has to be taken into account to ensure equitable progress into the future (Martindale, 2002). For example, ICT training materials need to be translated into local languages for those not skilled in English as a medium of instruction. Without localising ICT programmes in terms of language many of South Africa's citizens will be excluded from the digital world.

2.4.2 South African Development Challenges

Henry (2019) refers to what is called urban bias, which is a tendency for countries to drive development towards urban areas versus rural areas. South Africa is no different from this urban bias which has unfortunately left the rural population lower on the priority scale. Choung and Manamela (2018) argue that rural people are more likely to be disadvantaged with regard to internet access when it came to the quality of education and access to career information.

Some of the challenges faced by people in rural settings include access to computers while urban citizens are reported to have a device to access the internet with. Access to electricity remains a challenge in rural areas and therefore reliance is on public facilities like clinics, libraries and schools to access the internet (Choung & Manamela, 2018).

With 53 per cent broadband penetration (Broadband Commission, 2018), and mobile access of more than 100 per 100 people (ITU, 2021), South Africa has an opportunity to leverage mobile smartphone technology as a means to drive technology adoption. The opportunity to provide mobile literacy training and courses based on the depth of penetration of mobile devices is a viable option to ensure accessibility. The ITU Digital Trends Report (2021) confirms a startling implication of the figures above, however, which contradicts the supposed challenges. According to the report, many people are not connecting to the internet even with mobile infrastructure and smartphone access. However, this assertion is to be tested in the field and proven.

2.5 WHAT FURTHER DIGITAL LITERACY LEARNING HAS BEEN ACTIVATED BEYOND NEMISA PROGRAMMES IN BENEFICIARY COMMUNITIES?

2.5.1 Provision of new learning opportunities

Chetty et al. (2017) note that digital skills are the perfect antidote to break the cycle of poverty and inequality in South Africa. This is only possible at the moment for privileged societies; therefore those who do not have the means can be excluded, thereby leading to endless cycles of poverty.

The value of such technological innovations such as e-learning is that not only does it fit multiple applications in school or workplace settings; the use of it also facilitates the learning of both the subject as well as the use of the instrument and furthermore, it presents an opportunity for virtual learning environments serving physically dispersed learners ((WEF, 2020)This is beneficial within the South African context where quality education is not necessarily afforded to all and sundry and the rural settings are normally left behind due to there being few qualified administrators or teachers for technology subjects.

2.5.2 Concepts in enabling digital literacy

2.5.2.1 ICT4D

Information and Communication Technology for Human and Social Development (ICT4D) is an emerging field in research which appeared around the 1990s. The primary purpose of this field has been in identifying how ICT can be used to better the lives of people (Walsham, 2017). Heeks (2010) supports this statement by positing that ICT is a valuable vehicle for various employment opportunities for the poor and promotes sustainable human development.

ICT4D has the following benefits, according to Bhatnagar (2000), to offer support in the decision-making process of public administrators for the enhancement of developmental programmes, improve public and other services to citizens and allow empowerment of citizens by creating access to knowledge and information.

Access to ICT is important for the integration of all citizens into the global knowledge society. Universal access will contribute to the development of a global partnership and meet SDG 17's objective (UNRIC, 2020 p. 6): "Strengthen the means of implementation and revitalise the global partnership for sustainable development." ICT is seen as a powerful enabler in achieving this global partnership and the following key performance indicators (KPIs) point to the integration of activities:

1. The total amount of funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies.
2. The number of countries with mechanisms in place to enhance policy coherence of sustainable development.

Research on ICT4D may contribute to developing in-depth knowledge about ICT4D, and through the practical contributions to development that research may provide, as currently, limited contributions relating to theory and methods are preeminent. One criticism of ICT4D from the industry is the lack of a methodological perspective. For example, Walsham (2017) posits a transdisciplinary methodological approach to explain ICT4D better. Heeks' (2010) work which offers guidance on how to improve the contribution of ICT to development, supposedly lacks a proper explanation of the connection of ICT to development.

ICT4D projects include multi-purpose community centres (MPCCs) or telecentres in rural and disadvantaged communities. These are to give community members alternative modes of access to ICT; for example, for the unemployed who want to draft their resumes and those who want to open businesses or need access to their emails. With the advent of online learning, others can do online courses on platforms such as Coursera, edx.org and Allison. The extent of these platforms is that courses through various technologies can be provisioned to accommodate indigenous languages.

Most literature on ICT4D implementations points to its failure for projects to achieve their intended results (Pade & Sewry, 2009). ICTworks (2017) reports that the failure rate of most ICT4D projects was sitting at 40 per cent to 70 per cent. More importantly, the interdisciplinary collaboration across various streams from community, NGOs, universities and governments, is critical to achieving the expected outcome from these projects.

2.6 MULTILITERACIES THEORETICAL FRAMEWORK

For individuals to live and thrive in the ever-evolving digital world, literacies are more than ever essential to the complexity of navigating this new terrain (Holloway et al., 2020). Due to technological developments literacy has to encompass multiple mediums and this has led to the development of multiliteracies to be effective across multiple domains (Olivier, 2019) as literacy was previously focused on reading and writing. One of the key drivers of this multiliteracies perspective is the prevalence of the internet as it permeates across various economic, social and global societies (Olivier, 2019)

Literacy as a concept was traditionally considered as an ability to read and write printed text (Nabhan, 2021). Due to its importance as a survival skill it was declared a basic human right (UNESCO,2005). In the South African context, various challenges exist which impact such as poorly resourced schools , unemployment and untrained educators . All these factors impact the fundamental human right of individuals to be literate. Low literacy levels impact the economic potential of a country and its citizens and how it competes in the global community(National Literacy Trust, 2022).

The evolution of technology has impacted the traditional view of what literacy means in the 21st Century and various evolutions of literacy have emerged that impact what literacy should mean for this modern society. Learning and technology are synonymous topics in most learning environments as the worker of the 21st century needs to be able to interact and navigate using technologies. This prompted the research to take a deeper look at the evolution of literacy and how emergent theories have an impact on how learning can be administered. The below diagram depicts the evolution of literacy theories in the digital era:

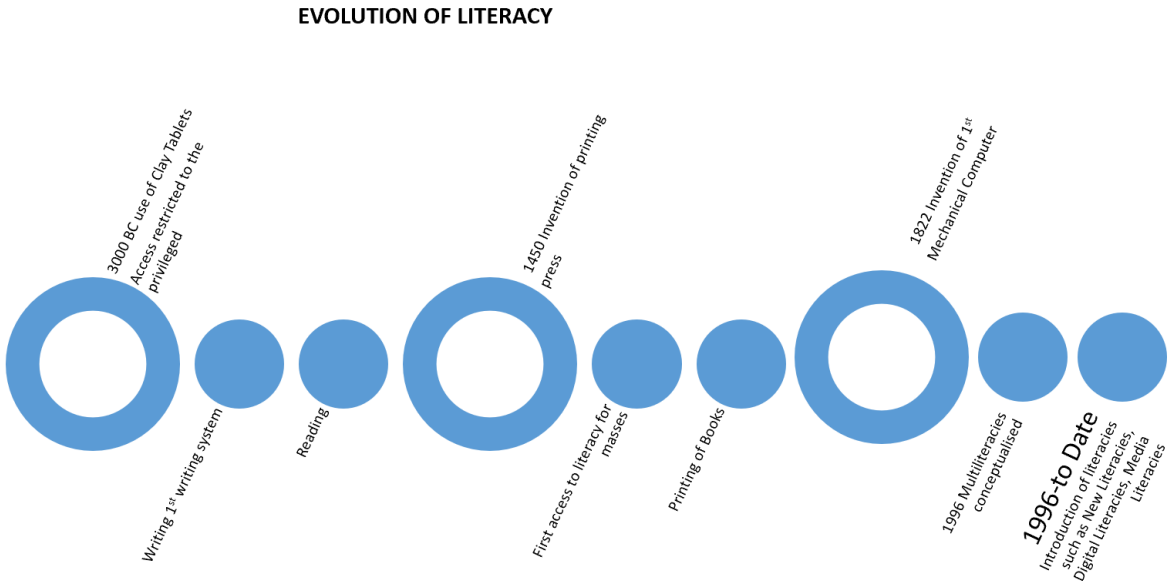


Figure 2.1 The Evolution of Literacy

The study used the multiliteracies theory as the theoretical framework. Multiliteracies theory is one of the frameworks that is used in determining learning environments designed for either informal or informal environments The New London Group conceptualised this theory

in 1990 (Holloway et al., 2020). Their theory was centred on two pillars, one being the multiplicity of communication channels and secondly the cultural and linguistic diversity.

According to the New London Group, literacy in its traditional sense had been boxed into a language context based on rules such as sound-letter correspondence (Harvard Educational Review, 1996). According to Harvard Education Review (1996), the New London Group argued this need for multiliteracies based on the factors such as changing technology landscapes, the widening gaps in society between the affluent and not so affluent and the affordance for such technologies.

The New London Group was driven by the concern for what they term life chances as it pertains to moral and cultural literacy pedagogy. They argued that Cultural and Communication media changes are the factors that require a review of the literacy pedagogy (Harvard Educational Review,1996).

The New London Group (Harvard Educational Review,1996) postulated that languages for meaning have impacted the changing world of work, citizenship and way of living which implies terms of preparation for this new language of work and way of life. Multiliteracies view learning as something that happens within the social context in which it is conducted (Holloway et al., 2020). To encourage lifelong learning and ensure students, citizens and organisations are attuned to the changes, a multiliteracies approach becomes critical.

There are 5 pedagogies within the Multiliteracies framework, and these are:

1. Linguistic Meaning
2. Visual Meaning
3. Audio Meaning
4. Gestural
5. Tactile and Spatial Meaning

These pedagogies help assist educators and policy in curriculum design whereby students are encouraged to apply their skills either in critique or creative application. Such approaches are crucial drivers which foster a positive association with education and encourage lifelong learning. Due to the ever-evolving technological landscape learners and

workers engaged in personal development and self-directed learning is therefore well attuned to benefit from this pedagogical approach.

According to the Harvard Education Review (1996), multiliteracies comprise four dimensions namely, Situated Practice, Overt Instruction, Critical Framing and Transformed Practice. Situated Practice is concerned with the context of the individual students' backgrounds and experiences. These also include individual skill sets as well as lifeworlds (McKay, 2014).

The value of situated practice is the real-world problem-solving context, and it empowers learners to be active participants in resolving the problem themselves. Situated practice as a dimension is an empowering catalyst to ensuring self-directed learning and real-world problem solving thereby ensuring literacies such as digital literacy not only yield value in terms of skill set but also as social empowerment.

Overt instruction is the traditional classroom learning experience whereby an educator delivers the lesson (McKay, 2014). This dimension is based on the educators' imperative to develop the learners based on lesson plans, activities and assessments. The difference between Overt instruction and Situated practice is the locus of control with the onus being on the educator rather than the student.

Critical Framing is the practice whereby learners continuously examine their learning and literate practices (McKay, 2014). The onus is again placed on the learner to examine in-depth multimodal and language functions. This would be beneficial in that the learners' metacognition capabilities are well developed. Whereas Situated practice focuses on real-world context, Critical framing is concerned with the historical, political, ideological and value-centred relations (McKay, 2014). Critical framing requires learners to critique against multiple dynamic established systems.

Transformed practice is the final dimension which focuses on the learners not being passive consumers of knowledge (McKay, 2014). The learners are directed to produce knowledge and content in relation to their social context and to be solution-oriented within the context of their real-world situations. There real value of Transformed practice is the contextualised assessments which ensure that learners are empowered within their context.

According to Navehebrahim (2011) the influence of new and emerging communication technologies influences the evolution of literacy as previous understood and the impact of cultural as well as diverse languages further highlight the importance of multiliteracies. The researcher argues that the South African context presents a complex environment that requires a broader scope in how programmes aimed at digital literacy needs to be considered. Curriculum designed from a educational context and the general public needs to create unique learning experiences that cater for the multi-faceted environments and the unique environments that individuals come from.

An emphasis on learning environment design which is ensures that the digitally literate individual is able to employ skills such as problem solving, critical thinking and other skills that are important in the digital era. A multiliterate individual is able to, constructing meaning draw on experiential as well as contextual, and disciplinary knowledge they have developed about the world (Navehebrahim, 2011). The researcher argues that the design of learning programmes and the administration of such programmes needs to be improved with consideration of the expected outcomes of an individual to thrive in the digital era.
Westby (2010) further posits that communication is an important element in society and thus for individuals need to be able to communicate multi modally as the proliferation of technological, global cultural and social dynamics of the 21st century become prevalent. Furthermore, people are now surrounded by multiliteracies and in order proficiently navigate and interact with this environment being multiliterate ensures an individual can participate in creation as well and consuming of information. The researcher argues that digital literacy initiatives should ensure that individuals are equipped to positively interact in the digital era particularly with the proliferation of social media platforms as well as the advent of cyber bullying, cyber attacks and digital platforms for payments.

Therefore, within this context of multiliteracies the researcher formulated the following research questions;

- What has been the influence of NEMISA's digital literacy programmes in beneficiary communities?
- How has access to NEMISA's digital literacy programme improved economic and job opportunities?

- What further digital literacy learning has been activated beyond NEMISA programmes in beneficiary communities?

The researcher formulated the following research proposition:

Proposition 1. NEMISA's digital literacy programme is ineffective in achieving development outcomes

Proposition 2. Digital literacy is a critical enabler of lifelong learning and empowerment and employability

Proposition 3. Digital literacy improves viability in the information society and digital economy

The three capabilities and competencies embedded within digital literacy as posited by Bradbrook et al. (2004) were used, namely:

1. Information Literacy

Information literacy comprises critical analysis skills to:

- Search information resources
- Access information resources
- Evaluate information resources

2. Technology Related Literacies

Technology-related literacies a composed of two parts, namely:

- ICT Literacy
- Acquisition of skills for newer technologies
- Transfer skills to newer technologies
- Web Literacies
- Skills required to use online tools

3. Composite Literacies

Composite literacies a composed of two parts, namely:

- e-Learning Literacy
  - Competencies to use technology-supported learning
  - Resources for technology-supported learning
- e-Citizenship
  - Use of appropriate tools to meet social goals

According to Becker (2017), investing in humans is empirical as better education leads to better long-term income which correlates with the economic development of a country. Grant (2017) argues that education has an important economic value and that economic thinking has thus far tended to ignore the productive returns that education has had on the development and the economy. Investment in education is an important consideration for a country to derive competitive value and achieve socio-economic development.

Policymakers in their role to yield the benefits of digital literacy initiatives should design digital inclusion initiatives promoting diversity in media ownership and expanding digital literacy while teaching participants to create meaningful content.

2.7 CONCLUSION OF LITERATURE REVIEW

The purpose of this literature was to provide the researcher with the current theory and existing research on the topic of digital literacy. The influence of digital literacy in improving livelihoods was explored and various trends have impacted the development of initiatives that seek to improve digital literacy.

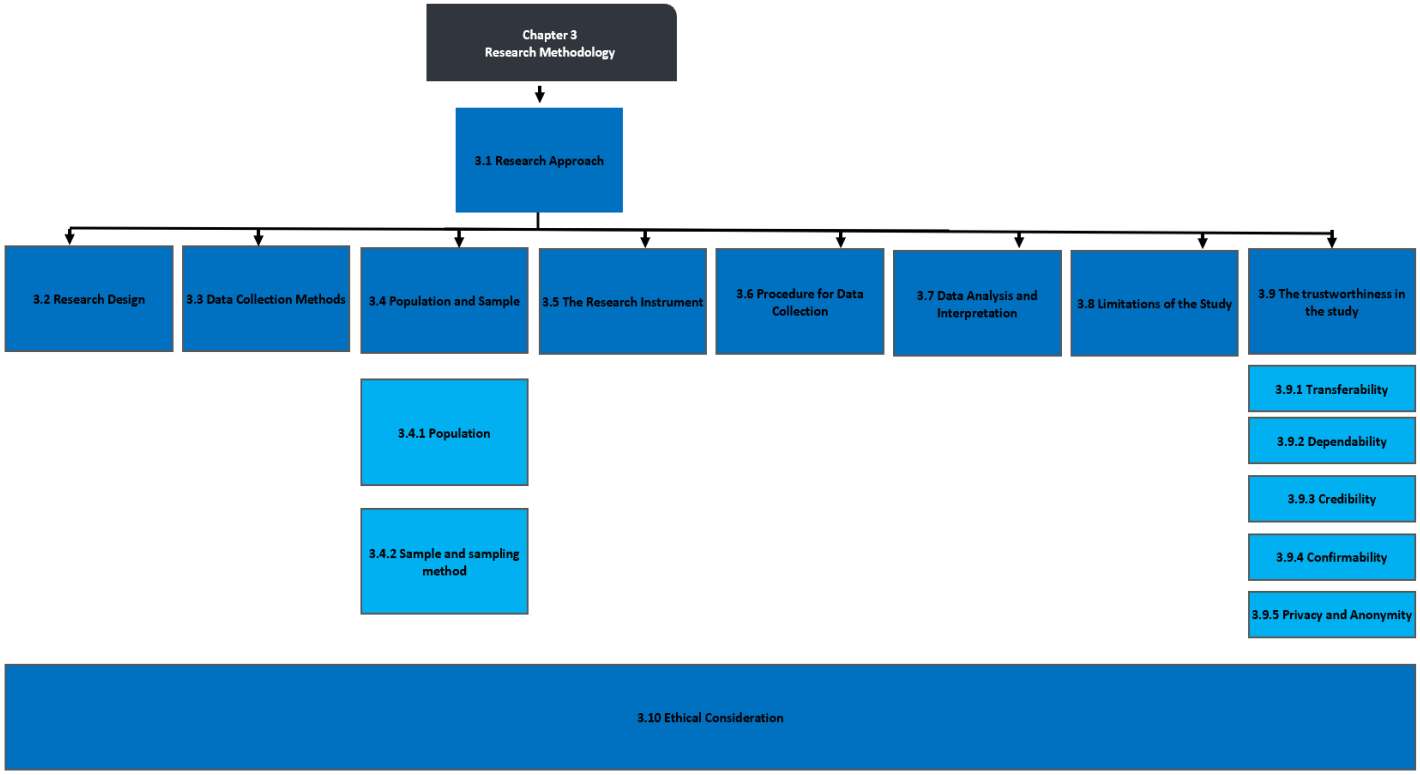
The evolution of technologies has impacted everyday lives and learning is no different. The methods of delivering education have to evolve in line with this evolution and this presents opportunities for the potential that technologies have to bridge the societal economic opportunities for every citizen of the country. Equitable learning opportunities are essential to prepare learners for the future of work, e-citizenship and to navigate everyday living. Digital literacy is the foundational skill required to effectively participate in the fourth industrial revolution.

Digital literacy is essential driving lifelong because of platforms such as social media which employ the use of video, infographics and text gaining prevalence. People are constantly

engaging on social media platforms such as Facebook, Twitter and Instagram. This exposes users to potential threats such as cyber-attacks and leaves them vulnerable to attacks. Users are also likely to abuse such platforms which may impact their reputation, particularly when looking for work. However, the opportunity presented by such can also extend learning beyond the classroom thereby improving the livelihoods of people if employed correctly.

The are various concepts such as ICT4D that have been growing in influence in terms of assisting with access to technologies programmes, particularly for developing countries. ICT4D as a field is concerned with how ICT can be used to improve people's lives. It is purported to be the bridge for human development by exposing people to possible employment opportunities.

The multiliteracies theory plays have been used in this study as the foundation framework for digital literacy. Multiliteracies are used in education for learning design. This is central to this study as the impact of technology on learning requires a review of how education and learning are administered. The New London Group conceptualised framework for literacy in the new digital era provides further guidance on how the link literacies, education and technology can be employed by providing guiding pedagogy which takes into account the learners' context. This theoretical framework also takes into account the cultural diversity which is prevalent in South Africa and this can assist policymakers, administrators and key stakeholders in being more user-centric in their learning delivery design. Therefore, the theoretical framework provides a guideline and shapes how digital literacy initiatives can be effectively implemented.


Chapter 3
Research Methodology
3.1 Research Approach
3.2 Research Design
3.3 Data Collection Methods
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CHAPTER 3. RESEARCH METHODOLOGY

Research is important in that it drives knowledge production (Jokonya, 2016). Research is a systematic process of collecting and analysing data for a given purpose (McMillan & Schumacher, 2010).

3.1 RESEARCH APPROACH

The common research approaches are qualitative, quantitative and mixed research approach. This research study used a qualitative research approach. A qualitative research approach is an in-depth exploration of a phenomenon within a particular context (Rashid et al., 2019). It is a widely used qualitative research approach as it allows a researcher to gather data from multiple data sources. Baxter and Jack (2010) postulate that this method is effective in developing theory, evaluating programs and developing interventions due to its rigour and flexibility.

The value of the qualitative research approach is the interaction with the researcher and participants which allows the voice of the interviewee to be well framed from their viewpoint and perspective. This is due to the fact that the behaviour of the participants not being manipulatable (Baxter & Jack, 2010)

Creswell and Clark (2011, pp 1-2) defines the qualitative research method as an inquiry process of understanding a social or human problem based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting

The key value of the qualitative research approach in this research study is that it allows the subject under study to be tested from the detailed views of the participants to gain a better insight into one key concept (Creswell & Clark, 2011. The value of this research method is the interpretation it allows into the enquiry of the personal reflections of the participants.

Studies on the popularity of qualitative research approaches are characterised by the holistic discovery value an enquirer gathers through this method (Williams, 2007). To ensure that

the context of the multi-stakeholders involved in the value chain of the digital literacy programmes of NEMISA is not understood from a single perspective.

It also lends itself to being conducted in natural settings (Creswell & Clark, 2011). This is a key component of the subject being explored in this study as the natural settings as it pertains to the NEMISA case study, are relevant to achieving the study's objectives. This ensures that the context of study does not influence the subject under study and the natural context application is not manipulated which could impact the actual results of the research.

3.2 RESEARCH DESIGN

The research study employed a case study approach as this research method allows the research study to accurately analyse multiple variables (Zainal, 2007). Baskarada (2014) states that the case study methodology is widely used in qualitative research. Qualitative research allows the exploration of a phenomenon using various data sources through a variety of lenses to reveal multiple facets (Baxter & Jack, 2008).

Case study research methods allow for the holistic exploration of events and they are most popular in social science studies for studies about education, community-based problems, unemployment and illiteracy (Zainal, 2007). These topics are relevant to this research study as it pertains to multiliteracies and the information society. Zainal (2007) further states that extensive research, using a case study methodology, in particular for the study of government programmes, was efficient in determining whether the goals of a particular programme were reached.

Case study methodology assists in examining details at a micro level and these are based on real-life situations (Zainal, 2007). To identify the successes of government ICT initiatives, the research must ensure it examines data from various sources and a case study can provide real depth in the exploration of the programmes' success or failure.

This approach is of importance in this study as it focuses on the desired outcomes of understanding and explaining the influence of NEMISA Digital Literacy initiatives. Crowe et al. (2011) highlight the importance of this approach in uncovering the existing gaps in the implementation of a chosen strategy versus another. This is especially crucial as the

outcome of this study is to contribute to the various shareholders and stakeholders to ensure that the chosen strategies take to account the missing link in achieving the anticipated success of the digital literacy programme.

Case study methods types can be utilised such as exploratory, explanatory, descriptive, multiple case study, intrinsic, instrumental and collective case study methods (Baxter & Jack, 2010). For the purposes of this study, the researcher decided on a descriptive case study approach. A descriptive case study is employed when seeking to describe an intervention in the real-world context in which it is implemented (Baxter & Jack, 2010). This type of case study is aligned with the intended outcomes of this study to describe the influence of digital literacy initiatives. It lends itself to allowing the participants to articulate their experiences and real-world context.

Baha (2016) postulates that descriptive case study design is a formative method in describing the context as it exists and is often considered the first step in building a foundation for future and more complex studies. The study as intended by the researcher considered this character of the descriptive design as essential considering the foundational basis of existing literature on the research study being minimal within the said context.

A descriptive case study design is employed to describe variables without assuming any existing relationships between such variables and is often neutralist in nature (Baha, 2016). The opportunity to identify causal links in the study and to identify the variables at play is the other reason the researcher utilised this study design as a basis with an objectivist view of what the results would be in the field.

3.3 DATA COLLECTION METHODS

Primary data was collected using virtual platforms and telephonic interviews. The interviews were conducted using the Microsoft Teams platform. Frances et al. (2009) highlight the prevalence of interview methods such as telephone and email interviews in qualitative research which is due to benefits such as cost effectiveness. The researcher was able to benefit from this notion as the footprint of the interviewees was widespread and would have been costly to administer face to face.

These interviews were recorded and stored for further. Transcription of the interviews was applied to ensure that the interviews could be reviewed, and further analysis applied. The duration of the interviews was on average forty-five to sixty minutes long. This allowed for the accumulation of data that was used in the analysis.

In the current study, the participants' permission and informed consent were obtained prior to the interviews being conducted. To ensure that the participants fully express their feelings, observations and experiences, all the questions of the interview were open-ended.

These interviews were used to compare the current impact of the digital literacy programmes of NEMISA and highlight possible areas for improvement and provide recommendations to deliver more impactful digital literacy programs in South Africa.

3.4 POPULATION AND SAMPLE

3.4.1 Population

The study focused on the National Electronic Media Institute of South Africa (NEMISA).

Qualitative research equips the study with better tools to address a greater range of research problems (Busetto et al., 2020). NEMISA's current beneficiary customers, partnerships and academic staff are active participants in the value chain that delivers digital literacy programmes. To understand the spectrum of value from the different users or NEMISA customers, the population consisted of the following participants:

- Current NEMISA Students (3)
- Former NEMISA Students (3)
- NEMISA Academic Staff (4)
- Private Sector Employers (1)
- Public Sector Employers (1)
- Training Authority Researcher (1)
- NEMISA Beneficiary Entrepreneurs (1)

3.4.2 Sample and sampling method

Qualitative research methods use purposive sampling methods due to the capacity to provide richly textured information (Vaseleiou et al., 2018). This sampling method is ideal for the exploration of a key central phenomenon. The research study aims to develop key insights around digital literacy and the initiatives and thus this method lends itself to fulfilling that purpose.

To achieve the required depth in information relating to NEMISA digital literacy, an initial review of the data about the NEMISA constituents was conducted using social media platforms such as Linkedin. The participants needed to be affiliated with NEMISA either as Management, students, lecturers or stakeholders. The aim was to recruit a mix of participants that spans the various participants either as beneficiary participants and the custodians responsible for the delivery of the NEMISA programmes, to ensure multiple stakeholder perspectives. This sampling method also ensures that the participants who are chosen for this study are knowledgeable and have interacted with the NEMISA programmes.

Qualitative research interview can either be semi structured, lightly structured or in depth (Jamshed, 2014). A semi structured interview design is where a set of pre set open ended questions are drafted to drive specific outcomes for the interview while allowing the flexibility for the interviewees to express their views or feelings while keeping to the core structure of the pre set questions (Jamshed, 2014). Semi structured interviews also allows the researcher the ability to probe further with a series of unstructured questions to uncover unintended or interesting information that requires further clarification (Frances et al., 2009).These types of interviews are conducted once with the respondents in contrasts to longitudinal studies over a longer period of time.

According to Frances et al, (2009) it is important to ensure clear role differentiation between the interviewee and the interviewer. Rapport and trust are critical building blocks to ensure that the interview is successful. In order to establish this trust and rapport active listening and prompting from the interviewer is essential (Frances et al., 2009).To ensure that deep insights are gathered it was important to ensure the participants could express in detail their experiences and knowledge to ensure the interviews yield the expected outcomes.

3.5 THE RESEARCH INSTRUMENT

The research was administered via an interview as the research instrument due to the in-depth rich information it allows for a qualitative study. The added benefit of this instrument is that it allows the participant and the researcher the flexibility to explore any area that comes up in the interview to gain a better understanding and provides the researcher with contextual insight as participants are observed in specific settings.

The format and structure of the interviews were primarily designed to be open-ended to allow the participants the opportunity to express themselves fully in the interview. The questionnaire consisted of nine questions. The respondents were presented with questions that they were asked to expand on, providing a proper reflection on the question.

The questions were administered in English as an official business language and which is widely spoken in South Africa.

3.6 PROCEDURE FOR DATA COLLECTION

Participants were approached through multiple communication channels to solicit their responses to the research study. Due to the various locations where the respondents were based, the ideal medium to initiate the communication was via email. This initiated the first contact where the participant offered consent to extend the communication via a virtual meeting platform.

In some cases, consent was required from the participant's employers. Formal communication on the purpose of the study was sent to get the required approval for the participants to openly participate in the research.

All the interviews were conducted using the online virtual meeting platform Microsoft Teams. This ensured that the participants would be able to participate in the interviews in their preferred location. The participants needed to be in a location that was quiet and free from distraction hence the participants were informed and a meeting invite was shared prior to

the interview in order for the participants to prepare their space appropriately. The researcher and participants needed to ensure a stable internet connection to ensure a seamless interview process. The participants were informed of their option to keep their camera's on or off depending on preference.

The outcome of the data collection was noted for each participant's interview, capturing responses, visual cues and other insights that the interviews might have highlighted.

3.7 DATA ANALYSIS AND INTERPRETATION

This research study used Inductive thematic analysis of the data to identify themes and trends in the gathered data. For the professional running of the Interviews, the participants were asked for permission to record the interviews; where this was not given, notes had to be transcribed.

An inductive thematic analysis is conducted to ensure that the research process is credible and that it can ensure a systematic approach in how the data is treated to ensure precision and consistency (Nowell et al., 2017). It is 6 step approach that a researcher can undertake to ensure that the large data sets generated from the interviews is well summarised and articulated while keeping the consistency of the rich insights gathered through the interviews.

According to Nowell et al (2017) The first steps is familiarisation with the the data from the interviews. The researcher has reviewed the video recordings of the interviews and read through the transcripts. Furthermore, the researcher reviewed any written notes that were transcribed during the interviews with the various respondents. The second step in the process is generating codes from the initial data gathered (Nowell et al.,2017). In this phase of the analysis the researcher identified the keywords and points from the research and through the process allocates labelling to ensure relevant data is extracted which helps the researcher with organising the data.

The third step in inductive thematic analysis involves searching for themes through triangulation and establishing connections in the data from the interviews (Nowell et al., 2017). In this step of the process the researcher categorises the data to ensure that

highlighted themes and their hierarchy and relevance is established. The data gathered was summarised and themed to explore the main themes emerging regarding the impact of the digital literacy initiatives in South Africa and underlying similar themes were categorised together.

The fourth step in this analysis involves the reviewing of the themes identified (Nowell et al., 2017). The researcher reviews the themes that have been highlighted against the objectives of the study in order to refine and clarify their relevance to the intended outcomes of the study. In this research study, inductive thematic analysis is employed to deduce relevant data as it pertains to digital literacy as there is a vast amount of data that is related to the subject but that may not be relevant for the purposes of this study. Upon collection of this data, consolidation of data was done to assess the comprehensive data to get a holistic appreciation of the respondents' digital literacy initiatives perspectives.

The fifth step in the analysis involved defining the themes that were identified and reviewed. This step involves setting a definitive criterion for the naming of the themes and ensuring categorisation is clear and unambiguous (Nowell et al., 2017). Due to the multiple stakeholders that the researcher interviewed, it was apparent that the connections do exists across multiple stakeholders and the patterns were also prevalent around particular themes such as broadband connectivity, lifelong learning, 21st-century skills, and entrepreneurship. These allowed the researcher to gain deeper meaning and appreciation of the factors that influence the success or limitation of digital literacy initiatives.

The final step in the inductive thematic analysis is studying the categorised data and writing in a form of a final report the observations from the data. The final report should provide an interesting account of the themes and their interpretation (Nowell et al.,2017). The data was then assessed and analysed to allow the researcher to extract relevant theory that explains the phenomenon revealed in the patterns that were consistent across all stakeholders. Furthermore, the researcher was able to generalise the data for ease of predicting based on these generalisations, a theory that likely impacts digital literacy and appreciation of the multi-stakeholder view.

Inductive thematic analysis in this research study was aimed at developing deeper meaning from the insights of the research. The meaning derived from the respondents of the digital

literacy initiatives research reveals patterns in data that can allow the researcher to isolate repetitive patterns and derive connections for deeper meaning and common relationships from the insights.

The data was then assessed and analysed to allow the researcher to extract relevant theory that explains the phenomenon revealed in the patterns that were consistent across all stakeholders. Furthermore, the researcher was able to generalise the data for ease of predicting based on these generalisations, a theory that likely impacts digital literacy and appreciation of the multi-stakeholder view.

3.8 LIMITATIONS OF THE STUDY

While the study progressed reasonably smoothly, there were some issues to consider:

- The sample size may be insufficient.
- The research was heavily dependent on the interviewee's ability, to be honest.
- The researcher's presence during the research process may have influenced the interviewee's responses.
- The virtual setting may have been perceived as impersonal.

3.9 THE TRUSTWORTHINESS OF THE STUDY

According to Lincoln and Guba (1986), trustworthiness is an appropriate measure for a qualitative study and thus the criteria to measure trustworthiness are listed and expounded on below.

3.9.1 Transferability

The degree of transferring the results of the research to other contexts and settings and with different respondents (Lincoln & Guba, 1986). Transferability in this research study was ensured by a thorough description of themes and patterns identified. Provisioning as much context and in-depth insight into the context ensures that enough information can be used to identify in similar contexts the transferability of the study and the findings. Shenton (2004) states that a thick description of the phenomenon under study can assist in ensuring that

transferability. The researcher ensured that a thick description is provided in the research context, the data collection, data collection analysis and recommendations to allow future research work to assimilate the current phenomenon under study.

3.9.2 Dependability

The consistency and repeatability of the findings of a research study (Lincoln & Guba, 1986). For this research study, careful attention was paid to articulating the questions to minimise any bias or unclear inferences. A logical process of selecting participants, conducting the interview, the analysis as well as reporting the results was fundamental to ensure that dependability was achieved throughout this study. This attention was also key in the interpretation of the findings to avoid any generalisations.

Shenton (2004) posits that ensuring that the operation process of the data collection process can assist a reader and future study researchers to replicate the study being undertaken in a different context. The researcher has outlined the procedure in the data collection process to ensure that the process, in this case, can be replicated.

3.9.3 Credibility

One of the methods to ensure credibility in qualitative research is triangulation. In research, this can be done through the assessment of various secondary data sources to confirm the alignment of the findings to existing studies to develop a comprehensive understanding of the phenomenon (Patton, 1999).

The factual findings of a research study are representative of the truthful occurrence (Lincoln & Guba, 1986). The researcher also used the triangulation process (virtual interviews) during the data collection period to ensure the credibility of the data obtained. One of the ways to triangulate in research is called methodological triangulation. This method is suitable for this research study as it accounts for methods for data collection such as interviews and observations. Triangulation is essential to ensure accuracy and to minimise the researcher's biases as it relates to the data collection and data analysis. The researcher also ensured that the verbatim responses received from respondents were checked to correct errors

either in interpretation or ensure that the actual voices of the participants were articulated (Noble et al.,2015). Shenton (2014) postulates that ensuring that participants are notified of the right to participate ensures that the actual participants are genuine in their responses. During the data collection of this study, the researcher ensured that participants are informed of their right to decline participation.

3.9.4 Confirmability

Confirmability is the degree of neutrality on the part of the researcher ensuring that the subject under study is not influenced by researcher bias (Lincoln & Guba, 1986).

This was done by playing back to the questions during the interviews as well as the reasoning which was used to ensure that the respondents' answers were not influenced by researcher bias. To limit the researcher's bias and perspective in this study. The interviews that were conducted have been stored for raw data purposes and can be confirmed. To align the data usage is limited to the criteria as per the objective of this study, the researcher ensured that the data reduction process focused on data that is essential for this study. Furthermore, the researcher processing the data for coding purposes focused on answering the research objectives of this study.

Shenton (2004) posits that one of the methods to ensure confirmability is using an audit trial. An audit trial is conducted using the following steps:

- Raw Data- The researcher collected raw data that is stored on the virtual teams platforms and on transcripts and notes taken from the interviews.

- Data Reduction- following the inductive thematic analysis, only relevant and highlighted data was used .

- Data reconstruction- the researcher used the codes and the thems from the analysis to align the data to the objectives of the study.

3.10 Ethical considerations

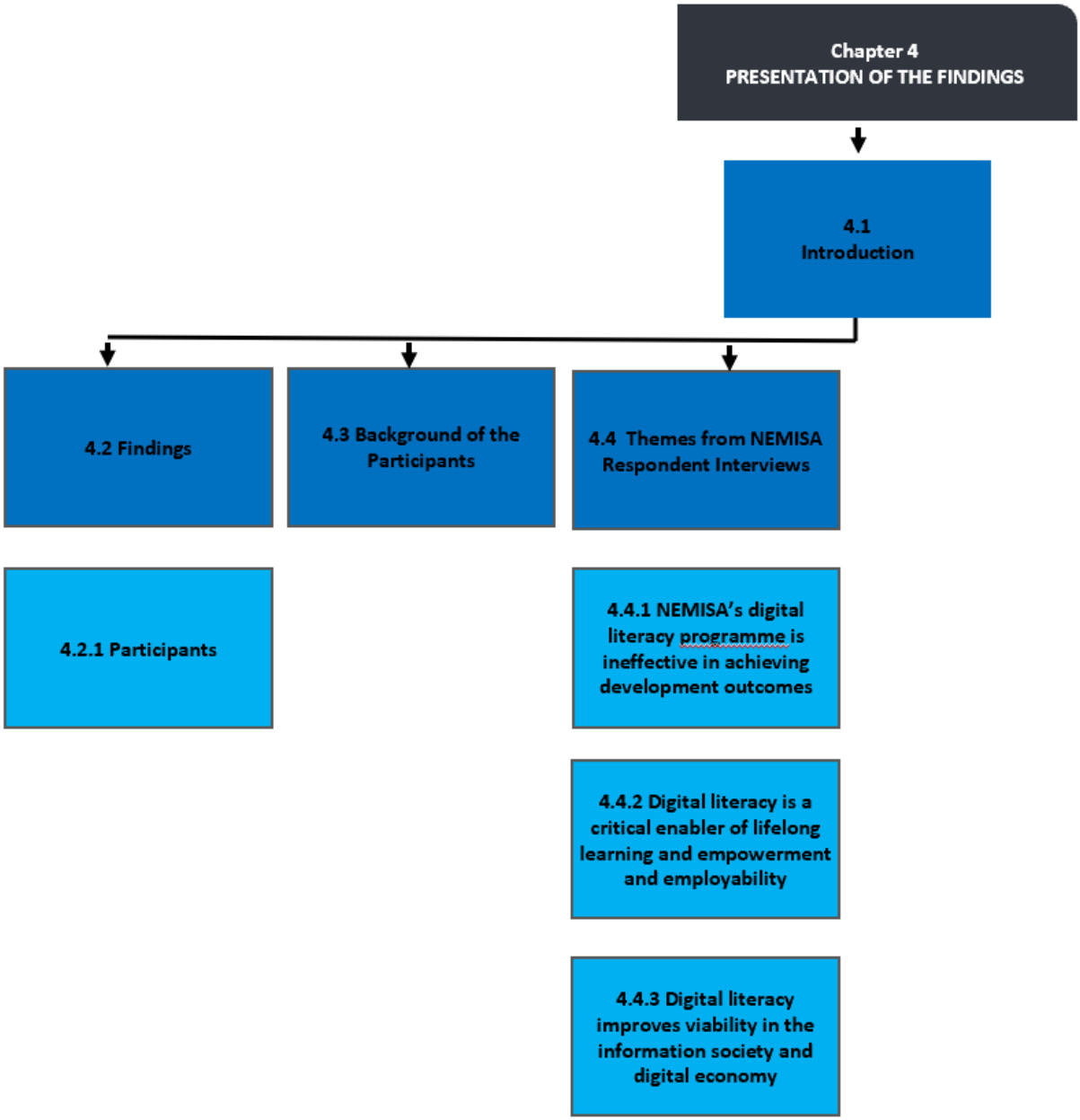
The purpose and the outcome of the study have to be clearly stated and understood by the researcher and interviewees. Fully articulating the expectations of the study ensures that participants are at ease about fully expressing their ideas, experiences, feelings and beliefs.

Permission first must be obtained from Witwatersrand University's Business School to proceed with the research and the approval to proceed with the research must be received before any primary data is initiated. This approval includes the approval of the subject under investigation, the methods of investigation and proper due diligence of the enquirer to abide by the ethical standard expected to administer this research study.

It is imperative to ensure that the privacy and anonymity of the interviewees are respected and that the participants are sensitised to this right. The processing of the feedback gathered storage and further usage must also be communicated to the participants to ensure that participants understand the intended use of the gathered information.

3.10.1 Privacy and Anonymity

Kaiser (2009) positions a dominant approach to ensuring research participants' confidentiality as a method by which a researcher can collect data from participants if their data cannot be collected privately. It is a method, addressed in the research planning in terms of getting necessary ethical research clearance from a research study committee and employing rigorous maintenance throughout data collection, data analysis and research findings reporting (Kaiser, 2009). In this study, the researcher ensured privacy and anonymity by following the setup ethics clearance process, ensuring that the participants get the informed consent forms and finally by ensuring data is collected, analysed, presented and stored with an emphasis on ensuring participants' information is protected.


Chapter 4
PRESENTATION OF THE FINDINGS
4.1
Introduction
4.2 Findings
4.3 Background of the Participants
4.4 Themes from NEMISA Respondent Interviews
4.2.1 Participants
4.4.1 NEMISA's digital literacy programme is ineffective in achieving development outcomes
4.4.2 Digital literacy is a critical enabler of lifelong learning and empowerment and employability
4.4.3 Digital literacy improves viability in the information society and digital economy

CHAPTER 4. PRESENTATION OF THE FINDINGS

The presentation of the results of this study employs the use of graphs, tables and quotations of verbatim responses from the interviewees. All the interviews were held virtually meeting platform with each respondent individually. All the Interviews were recorded and transcribed and the respondents were informed of the right to participate or decline as well as deciding on their right to confidentially. Upon collection of the data, transcription of the data was further conducted for further processing and to deduce prevalent themes.

4.1 FINDINGS

The study focused on the National Electronic Media Institute of South Africa (NEMISA) with the aim of addressing NEMISA's current beneficiary customers, partnerships and academic staff to evaluate the delivery of value across digital literacy programmes. In this chapter, the data collected from the research is outlined and presented. The data from the research which was gathered through virtual interviews are presented in the form of direct quotations from the respondents as well as graphics and tables for ease of reading.

4.1.1 Participants

Participants for this study volunteered their participation following a purposive sampling approach being adopted. Due to having a specific organisation as a setting for this study, specific criteria had to be followed in order to have the relevant participants for this research. Of the twenty approached participants, fourteen successfully and willingly concluded their interviews. Two of the respondents felt their area of expertise was not directly related even though it played an enabling function in rolling out of the NEMISA Digital Literacy programmes. Five of the respondents indicated an interest in participating; however, could not attend their interview. The remaining three did not attend their interview even though they had accepted the email invitation.

Fourteen interviews were held and the breakdown of the classification of the interviewees is as follows:

- Six of the interviewees were either former or current NEMISA students.
- Of the six former students, one was an entrepreneur who previously studied at NEMISA.
- One interviewee was a current tertiary student who got introduced through a mobile literacy programme and was working for an NGO.
- Two student interviewees are currently employed and studying further through NEMISA courses.
- Two interviewees are currently employed in the broadcast sector, in a technical department, both holding Electrical Engineering Diplomas, and both participated in NEMISA programmes.
- One interviewee is currently the National Director of Co-Labs for NEMISA.
- One interviewee is currently a trainer at NEMISA in the Eastern Cape.
- One interviewee is currently Head of e-Learning at NEMISA in the Eastern Cape.
- One interviewee is currently the ICT Project Manager at NEMISA in Franshoek
- One interviewee is currently a Centre Manager for an NGO partnering with NEMISA for Hackathons.
- One interviewee is an employer who has taken on a NEMISA graduate.
- One interviewee is representing a private sector entity currently running digital skills programme in South Africa.

The fourteen interviews were recorded and saved in the virtual meeting platform and the transcription of each interview is annexed to the research study below. This data was further processed to gather themes that assisted in further data analysis of the insights gathered from these interviews.

The six student respondents from this study were from beneficiary communities. This group of respondents students currently studying towards their tertiary education studies or who had already completed their studies and were looking to broaden their skill set. Three of the students interviewed indicated that they were able to acquire economic opportunities through participation in the NEMISA digital literacy programme. Moreover, one student pursued their entrepreneurial aspirations through the impact that the training had on them, even though they previously had started a tertiary qualification and had not completed this. Two students had also pursued further development through programmes provided by NEMISA. Table 4.1 below depicts the demographics of the respondents.

Table 4.1: Demographic Details of Student Respondents.

	Gender	Age	Qualifications	Work Experience	Years of Experience	Beneficiary community background
S1	Male	20-30	Certificate	No	0	Yes
S2	Male	31-40	Diploma	Broadcast Industry	2-3	Yes
S3	Female	20-30	Currently Studying	NGO	1-2	Yes
S4	Male	31-40	BTech	Telecommunication Industry	2-3	Yes
S5	Female	31-40	Degree	Advertising and Media	3-4	Yes
S6	Male	31-40	Enrolled-Could not complete studies	Entrepreneur-Digital Media Industry	7-8	Yes

Table 4.1 shows the gender split of the students respondents who participated in the research. Four of the respondents are representative of the male gender while two of the respondents represent the female gender.

The age split of the respondents who participated in the research indicates that two of the respondents are within the range of 20-30 years while four of the respondents are in the range of 31-40 years.

The table also illustrates the industries in which the student population sample is currently employed. A two of the respondents are employed in the Advertising and Media industry. Two students respondents are in technology-inclined roles in the Broadcast and Telecommunication industry underpinned by a strong ICT focus, while one of the students respondents was currently volunteering in an NGO that assists communities with health education. Lastly, one of the students was embarking on a technical role in the education sector.

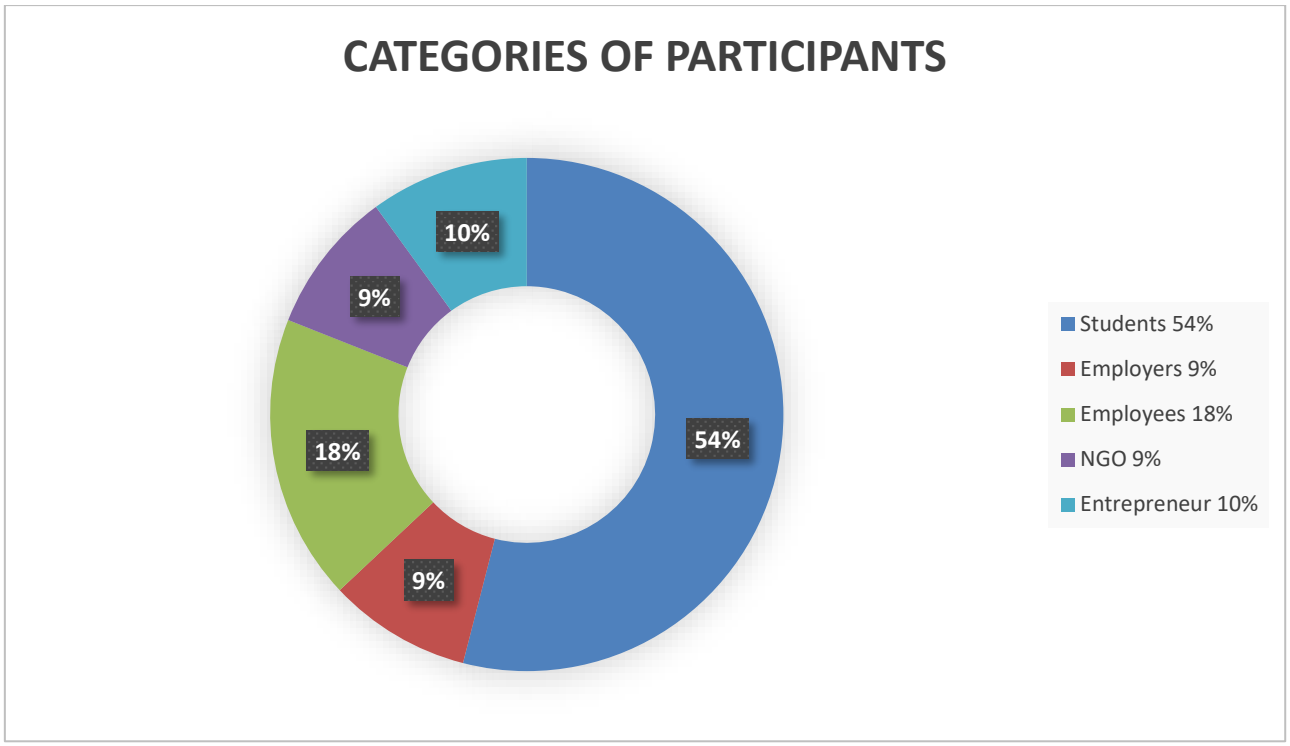


Figure 4.1: Categories of the Participants

The previous chart depicts the percentage split of the interviewees for this study. In total, 54 per cent of the respondents are current and former students of NEMISA. Nine per cent of the interviewees represent the employer base while 18 per cent are current NEMISA employees. A small group (9%) represents the NGOs in the form of centres that have partnered with NEMISA in delivering some of the programmes. The total of the interviewees representing the entrepreneur base is 10 per cent.

Table 4.2: Classification of the Interviewees - Students

	Qualifications	Work Experience	Years of Experience	Beneficiary community background
S1	Certificate	No	0	Yes
S2	Diploma	Broadcast Industry	2-3	Yes
S3	Currently Studying	NGO	1-2	Yes
S4	BTech	Telecommunication Industry	2-3	Yes
S5	Degree	Advertising and Media	3-4	Yes
S6	Enrolled- Could not complete studies	Entrepreneur-Digital Media Industry	7-8	Yes

Table 4.2 above illustrates that of the six students interviewed for this research, each of them had embarked on a tertiary qualification. While 9 per cent of the students were still studying, 82 per cent had at minimum a post-matric certificate. Notably, 9 per cent of the students had dropped out of tertiary education due to economic constraints.

The table above furthermore illustrates that 83 per cent of the student population were employed and had work experience. Of the student population sample, 17 per cent had no prior working experience but were in the process of being employed and awaiting their start date.

Overall, one student had no work experience whatsoever and currently completing their studies. One student had 1-2 years of work experience in an NGO but were currently studying. Two of the students had over 2-3 years of work experience in the Broadcast and Telecommunications industry. One student had 1-4 years of work experience in the Advertising and Media industry while one student had over 7-10 years of work experience and had eventually embarked on an entrepreneurial career.

Table 4.3: Student Location Classification

	Province	Area Classification
S1	Free State	Rural
S2	Gauteng	Township
S3	Mpumalanga	Rural
S4	Mpumalanga	Rural
S5	Gauteng	Township

S6	Gauteng	Township

The table above illustrates the location background of the student respondents. As depicted all the students who formed part of the study come from areas that can be classified as beneficiary or marginalised communities.

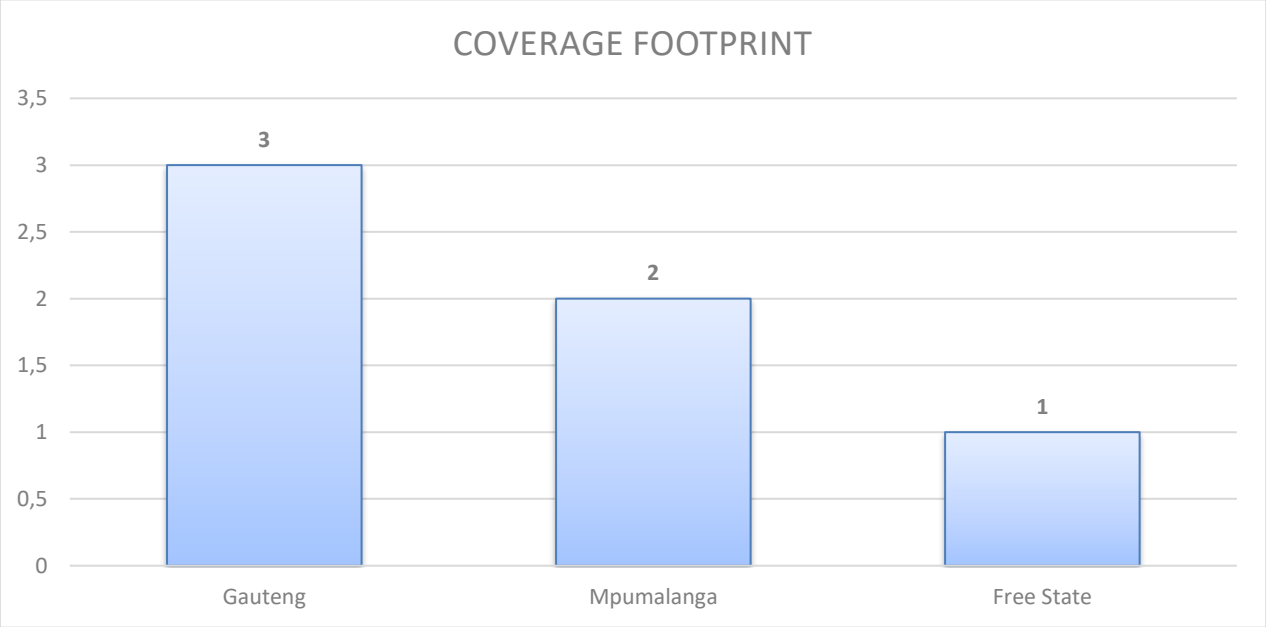


Figure 4.2: Students' Provincial Location

Gauteng had a higher representation of students with three of the students being from this province in terms of their backgrounds. Two students were originally from Mpumalanga and one student was from the Free State.

Table 4.4: Proficiency in Digital Literacy

	Email address	Access to a computer/Laptop	Access to a mobile phone	Access to Data	Courses Attended	Future Aspiration	Digital Literacy Rating
S1	Yes	Laptop	Yes	Yes	Digital Literacy	Cloud Skills	8
S2	Yes	Laptop	Yes	Yes	Digital Literacy Film and Production	Digital Audio Production	9
S3	Yes	Laptop	Yes	Yes	Mobile Literacy	Journalism	7

	Email address	Access to a computer/Laptop	Access to a mobile phone	Access to Data	Courses Attended	Future Aspiration	Digital Literacy Rating
S4	Yes	Laptop	Yes	Yes	Digital Literacy	Digital Broadcast, Software Development	10
S5	Yes	Laptop	Yes	Yes	Digital Literacy Radio Production	Multimedia Production	10
S6	Yes	Laptop	Yes	Yes	Digital Literacy Graphic Design		10

Table 4.4 above depicts the digital literacy proficiency based on courses attended as well as further study aspirations of the student interviewees. As the insights illustrate, all of the respondents indicated a basic digital literacy course exposure. They have access to email, laptops and mobile data.

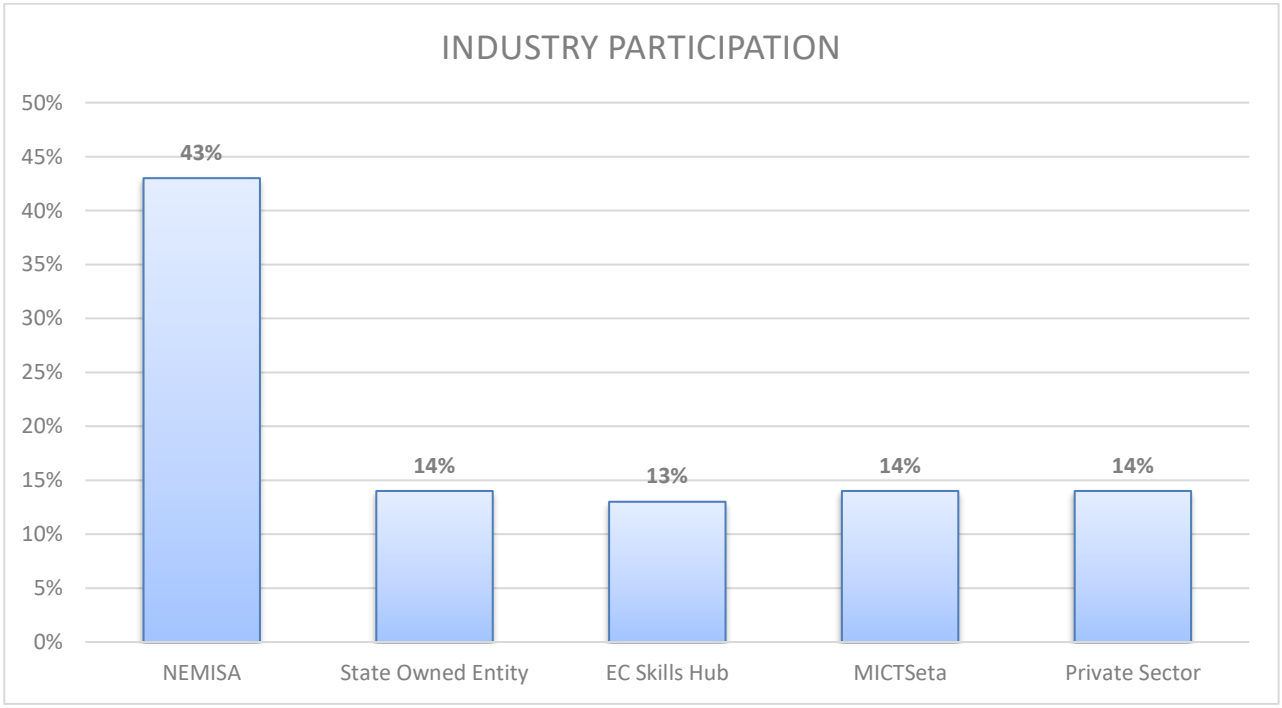


Figure 4.3: Industry Employees' Participation

Figure 4.9 above illustrates the participation of industry experts in the research study. Half (50%) of the interviewees are employed by NEMISA, 17 per cent represent participation in a state-owned entity as an employer and 17 per cent represent a partner of NEMISA in the

Hackathon programmes. A small group (16%) represents the MICTSeta, which is a sectoral education and training authority within the media.

Participation of industry experts was split right across job levels and are represented as in the following roles in terms of seniority or speciality:

- Two executive managers
- Senior manager
- Two managers
- Facilitator
- Centre manager

4.2 BACKGROUND OF THE PARTICIPANTS

Six digitally skilled students across South Africa were interviewed to understand the impact that participating in digital literacy and other NEMISA courses have had on them. Students were selected based on the following criteria:

- NEMISA course attendance;
- Aged between 18 and 35;
- Ability to digitally participate in the virtual interview; and
- Social media presence.

The students were interviewed to have a perspective from the beneficiaries of the programmes and the value they have derived from the courses attended. The students helped the researcher understand the research from a customer-centric perspective as the initiatives are targeted to improve the lives of the users of the programmes. Students also assisted in assessing the effectiveness of the programmes to either confirm or nullify the efforts by the government and policymakers in undertaking this strategic initiative for digital literacy.

Furthermore, five industry experts across South Africa were interviewed to understand their relationship to NEMISA and the initiatives they participate in to drive the digital literacy agenda. Industry experts were selected based on the following criteria:

- NEMISA affiliation;
- Technology industry participation; and
- Ability to digitally participate in the virtual interview.

The National Director of NEMISA Co-labs was interviewed to understand his role in coordinating the efforts of the Co-labs across the geographic footprint of the country. His role ensures the effectiveness of addressing the localised needs of the Co-labs in the area of presence and ensuring that the standard of delivery is aligned with the set standards at Head Office.

The Senior Manager: Research and Strategic Planning at MICTSeta were interviewed to understand the role the training authority has played in driving digital literacy and how the authority aligned with institutions such as NEMISA. The role she occupies is responsible for a 360-degree view of the sectoral skills gaps and strategies required to close these gaps. The researcher wanted to understand where in the plans NEMISA programmes fitted and how alignment with all possible stakeholders is sought.

The HRD from the state-owned company was interviewed to understand the quality of NEMISA graduates from an employer perspective. This could ensure that the quality of programmes delivered by NEMISA aligns with the industry requirements. The HRD was also able to highlight any possible professional work-readiness initiatives that are in place for NEMISA graduates; thereby ensuring that the feedback loop to the institution is closed as this can add value to current programmes.

A trainer at NEMISA was interviewed to understand the on-the-ground challenges that are faced in the delivery of digital literacy programmes. The trainer was an ideal interviewee to uncover the gaps in delivering the training and some obstacles that are real for the recipients of the training and they would also be able to get immediate feedback from the trained individuals as to the actual value of the training received.

A Skills Hub Centre Manager was interviewed to understand the value of partnering with NEMISA in some of the initiatives that expose the immediate constituents to programmes such as digital literacy and hackathons. The Centre Manager was also in a position to ascertain the challenges faced by local people in accessing opportunities in the digital economy and due to working very closely with these constituents, the Centre Manager has a thorough understanding of the need to address the gaps in training.

An ICT Project Manager from NEMISA was interviewed to gather insights on the initiatives currently underway from a NEMISA perspective and how these align with the other initiatives from other organisations that are rolling out their own projects. The ICT Manager has a teaching background and has first-hand experience with the transition from traditional teaching and the impact technology has had on teaching which also was enticing to the researcher as it may assist address interventions from a teacher perspective.

A Head of e-Learning was interviewed with the expectation that she may expound on the e-learning platform and its effectiveness in marginalised communities. She would also be able to add value to how the platforms can be leveraged for those not part of the mainstream education sector.

An HR Executive from one of the leading fibre backbone providers was also interviewed to understand the role that the private sector is playing in the initiatives that seek to improve the uptake of digital skills and grow the talent pool in the telecoms sector.

All participating respondents were knowledgeable and experienced to participate in this research.

4.3 THEMES FROM NEMISA RESPONDENT INTERVIEWS

The analysis of the interview data revealed six prevalent themes:

- Theme 1. Accessibility
- Theme 2. E- Learning
- Theme 3. Economic viability
- Theme 4. Future Skills

- Theme 5. Lifelong learning
- Theme 6. Partnerships

The verbatim response from the National Director of Co-Labs ensured that the responses could significantly relate to the questions as it relates to digital literacy.

*All courses and the programs are aligned to drive the digital literacy right through regardless of whether it specialized or not. Digital literacy is a component. (*R6)

When unpacking the influence of digital literacy initiatives, the following themes emerged:

Theme 1: Accessibility

The following were verbatim responses from the respondents:

According to the Training Coordinator, some of the challenges when administering in-field training is the challenge of access to smart devices and data due to high data cost.

We have a couple of tablets that we have acquired, about 20 tablets that we take along with come to those sites. But then at the end of the day after the training these tablets are retrieved. It's bad for those who do not have smartphones. So, the challenge they're facing is the data. Those that don't have data we provide them with a Wi-Fi router. So that they can connect and complete the course.

The training coordinator described that some of the beneficiaries of the training do not have basic email addresses. He also indicated issues in regard to assistive devices for disabled training beneficiaries. Furthermore, those that are disabled would require speech assistive devices.

*They forget their usernames. And the username is the email. The other thing that happens is they change emails quite frequently. (*R12)

Feedback from the field also indicated that training beneficiaries had challenges with accessing funds to get to the nearest internet cafes and pay for their cv to be edited and for the use of the internet while also struggling with payment for the commute.

I think it's getting access to opportunities and applying for these that most of the people are struggling with. (R5)

According to the National Director of CoLabs initiatives have been undertaken to improve training beneficiaries' training completion rates and some of these include the employment of independent facilitators in every province and this has improved the ability to reach more possible beneficiaries.

*There are a lot of independent facilitators. And they go out into communities, communities, but they also take responsibility to assist those on the platform to complete their courses. (*R12)

Measures have been taken by NEMISA to improve access and training by employing various sponsor-driven initiatives that lessen the burden of the cost of data.

*The digital skills platform is zero-rated. Students can use one of those two platforms and won't for the data. (*R12)

However, there are challenges according to the e-learning coordinator in terms of scaling some of the online platforms to accommodate more students.

*We only have to do 25 licenses and how we administer currently we do is we run the licenses for three to six months and actually rotate usage of these licenses. So, we end up with about 5000 students trained a year. (*R12)

The National Director explained the importance of partnerships to curb the issue of access. E skills Co-labs are institutions that have the requisite skills and experience in providing training and also who would have the footprint to spread NEMISA mandate national. NEMISA saw the need to collaborate to reach the millions of South Africans. Some areas however have unique challenges in terms of accessibility.

*In the Eastern Cape, some training is administered face to face with the beneficiaries. And in some instances, in these rural areas, some areas have bad connectivity, and this is actually a big issue. They would prefer to do the mobile literacy course. (*R6)

*The course is designed to be to be agile enough that depending on the type of challenges that you meet there that you would apply courses that are best fit in that scenario. (*R6)

Mobile digital literacy course has been explored as an alternative due to the proliferation of mobile devices. This is fundamentally important for people having challenges in terms of transportation, funds and equipment to access the course content.

Data costs also very expensive so you have to mitigate all those risks when creating courses. I think it's not a challenge that we are facing alone as NEMISA other universities also facing the same challenges, institutions of higher learning, TVETs and Colleges also facing the same challenges. And the trend is to work towards creating an environment where we can enable the students to access these portals. This is one of the routes we have taken as NEMISA recently towards the end of last year November where we recently got our e-learning portal which is an online portal. We got in zero-rated. (R6)

NEMISA's digital literacy initiatives seem to be attracting tertiary students and people already in a university setting. In this setting access to enabling technologies to learn are readily available. These students that are already inside the university system have access to the internet or to the library, or they're being provided data by the university or they get it from home or because they are being funded either by the private institution or they're being funded by various institutions that provide funding for students. Students in the university setting are in a better position to take advantage of the economic advantages of being in a setting conducive to technological learning.

If we were to take the same individual in a rural area, who would be doing essentially the same course, the ability for them to take advantage of the economic opportunities are very limited. But it doesn't mean they're not able to, it's just that the limitations are there in terms of someone from a rural area, who was not exposed to or who's not in a tertiary institution,

compared to someone who's in a tertiary institution. It's very hard in this instance for NEMISA to mitigate those types of elements. (R6)

Of the six students that were interviewed in this study, 100% of these students were exposed to NEMISA through their universities or further education institutions. These students were from marginalised communities; however, they were already in a tertiary institution or had completed their tertiary education. Two of the key respondents from NEMISA who work with the Co-labs indicated that connectivity is one of the reasons that students in the university system are likely chosen as beneficiaries as they have access to connectivity through their institutions of higher learning

To enhance and further progress internet accessibility, the marginalised have to be prioritised due to the fact that economic opportunities are not easy to find for those not in the economic systems. This further complicates finding employment. South Africa's unemployed youth with no matric make up 59% of the unemployed (NEMISA, 2017). This statistic further emphasises the importance of driving digital literacy initiatives toward those, not in the schooling system.

Our biggest challenge is connectivity. And it also to a large extent enabling devices with connectivity. (R6)

Accessibility is not only impacted by connectivity; however, factors such as ICT equipment, laptops and smartphones, educational content, learning facilities, funding, disabilities and skilled trainers and educators also play a role (UNESCO, 2020).

The researcher uncovered that the are various access challenges that impact the successful roll out of the digital literacy initiatives by NEMISA. Exposure to a tertiary institution seemed to be a standout factor for most of the students who were able to get access to NEMISA programmes. Social issues related to access to funding , connectivity, technology hardware and software also seem to be consistent in the experiences of either the students or the NEMISA representatives who are meant to administer the training.

Theme 2: E-learning

According to UNESCO (2017), the learning environment has changed in the 21st century due to emerging ICT such as hardware and software requiring adaptation of teaching methods. UNESCO further states that mobile penetration has been on the upsurge leading due to learners utilising mobile gadgets and applications; however, there is still a reliance on old classroom learning methodologies in order to offer learning experiences that are engaging and to minimise the learning environment divide, smart learning environments are critical to implementing.

The following example is some data taken from observation of the e-Learning Manager interview in terms of NEMISA's e-Learning platforms.

There are a lot of online courses that learners can get certificates for and if they are interested, they could further buy other courses however that information is something that they do not even know. (R5)

Though the opportunity exists for learners to engage NEMISA's online learning portal, It is fundamentally not well publicised in order for more people to access the platform.
If no one can access it. It essentially becomes a futile exercise. (R6)

Albeit in the early phases of the e-Learning platform journey for NEMISA, this provides a great opportunity to reach those that currently don't have the access to Universities and NEMISA affiliates.
We are actually currently rolling out a digital literacy-specific module online. We've taken that module and we're offering it to the Department of Education. But we're trying to formalize and finalize and get it officially Sita accredited. And that will be available on our website. (R12)

It emerged in the process of the research that e-learning platforms can provide NEMISA with key information that can monitor the number of beneficiaries of the training and provide in-depth information on the learning pathway for learners thereby ensuring that the actual numbers of learners are being impacted can be determined. At the current moment, NEMISA is in the process of doing an impact analysis that can quantify in numbers the progress that has been made thus far. The e-learning platform would be a perfect antidote for future analysis and tracking.

This e-learning system will allow us to map learning pathways to take the students through the learning journey. So, you would start with digital literacy. And later introduce other courses. Once a student has basic digital literacy they can apply to University of South Africa (UNISA) as an example. UNISA's courses are online now, so if you don't have basic digital literacy even studying through your UNISA type of institutions difficult.(R6)

Our platforms allow from the day of enrolment to upload demographics onto the system and we use these to check and see where our target groups come from. Information like the city that they're from, or the town, the province We also check the highest qualification and the current jobs as well as age and gender. (R12)

Instead of a lower intake of students, we normally take we can now sort of scale up. (R12)

We've had the Department of Education Project, which is going to be rolled out to high schools as well as primary schools as well. So, our mandate is mainly for rural communities and our mandate is more for women and people with disabilities than for men. (R12)

Currently, we do not have a mechanism where we can measure once they've exited our program. So, we are hoping to get those answers from that impact assessment from the university. But currently, we only measure the learning path. (R6)

NEMISA has three e-learning platforms that have seen significant uptake from various stakeholders, and they have successfully been able to get their e-learning platform zero-rated. Of the students, six students were exposed to NEMISA programmes; two who got exposure via the online learning platform have continued to use other platforms such as Coursera and furthered their learning journey. One who got exposure to the mobile digital literacy course has not engaged further with NEMISA but is currently finishing up her tertiary qualification while two of the broadcast industry students have gone on to further their studies in industry-specific courses.

We have technically three open distance learning or e-learning platforms have an amazing digital skills platform which is a cloud-based learning management system. (R12)

It's only now I think two years later that we actually got the go-ahead to zero-rate one of our portals, we're hoping to get all our portals that are rated so we can mitigate the risk of connectivity. (R6)

There has to be some sort of level of standardization between the courses that we're providing. So, it's very hard to deviate from what would be set as an international standard. Ensuring the availability of learning portals also requires the consideration of multiple factors such as the standardisation of the digital literacy programme. This is however not easy to do due to the various different needs of the communities in which NEMISA operates. At the same time, the course has to be aligned with international standards. Ensuring that you satisfy the objectives of the programme while taking into account the context in which you are rolling this programme is essential to the success of such online learning platforms.

Theme 3: Economic viability

Out of the six students interviewed, five of the students who participated were exposed to economic opportunities post their exposure to NEMISA courses. 1 of the 6 students was still embarking on tertiary studies but had been volunteering at a local NGO, driving health education. A resounding confirmation of the impact that NEMISA has had on these students was echoed by all the participants including the employer who was interviewed. The feedback echoed the ability of the graduates to be work ready and their ability to collaborate and communicate within teams. The other feedback was that these students were found to be advanced in terms of their entrepreneurial mindset and they were more digitally inclined versus an older generation workforce.

The following were verbatim comments from the respondents:

It has expanded my Curriculum Vitae (CV) and I've got many skills that I did not have before. Some of the things that I didn't know now I am exposed to. (R2)

We were taught about audio, digital, audio, video, digital video and how they come together in a production studio. We got exposure in a Television (TV) studio, and also, we've got exposed to Radio studios as well. (R8)

Feedback from the Training Coordinator indicated that the challenge faced by the beneficiaries is exploitation by providers of internet cafés and computer centres. This exploitation is a symptom of the low digital literacy levels as some of the functionality and service that beneficiaries get from these service providers could easily be conducted on their mobile devices.

These service providers charge small and medium enterprises customers exorbitant fees and it's the same for those who are looking for jobs. Small enterprise owners seek assistance with registration on the Central Supplier Database in order to offer their services to the government. (R5)

NEMISA respondents highlighted the importance of not only teaching digital literacy skills for the benefit of people applying for jobs however there was a common interest in all the respondents to start developing entrepreneurial skills alongside digital literacy.

You can get a job and there are few jobs to be got. It makes more sense for me to scale digital literacy and they teach you how to create a website where you could create your own. (R12)

Our target market seems to be within the 18 to 35-year range. The target would be to scale them towards these courses and the skills and also not only steer them towards these goals but actually have a learning pathway that can develop their skills to not only be in digit basic digital literacy skills or in specialised skills but for them to be able to start businesses. (R6)
We have recently partnered up with Small Enterprise Development Agency (SEDA) the small business and development agency where we are looking to use some of the hubs around South Africa where we can not only add skills. SEDA currently provides training to small businesses. And with these training programmes, also, they're going to be applied in rural areas where we can combine the skill sets within the business arena for small businesses and combine them both courses which are provided by NEMISA so the digital skills courses will be providing these skills in conjunction. The aim is not only to create individuals who have the digital skills but also have the business knowledge and also have the ability to access finance from SEDA (R6)

The employer highlighted some key skills that NEMISA graduates have demonstrated when compared to other school graduates. It was apparent that NEMISA produces work-ready learners that get to contribute positively as soon as they are employed.

NEMISA students can see that knowledge is broad and they see that they do not need a certain title but thy are keen to add value with what they have and can apply themselves to use what they learnt to benefit themselves. (R7)

According to Bejakovic and Mrnjaval (2020), employability is not just the capacity to get a job. It also includes the ability to adapt to a changing working environment which may lead to enhanced opportunities such as promotions in the workplace. Digital literacy, therefore, contributes to the strengthening of a knowledge-based society (Bejakovic & Mrnjaval, 2020).

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Theme 4: Future skills

The following were verbatim responses from the respondents:

NEMISA was able to prepare us to function as technical people in the broadcasting field. also was preparing us also preparing us for the future that was coming digital television. (R8)

By its nature broadcasting is broad. Network security should also be included in the course. Even if it's just the basics on how to develop systems to mitigate the risk for a breach. (R4)

I'm targeting all South Africans from young to old in digital skills, from basic digital literacy, right through to specialized skills. Specialist skills are currently primarily for the Fourth Industrial Revolution. (R6)

What I've talked about with the Co-labs before is that when we go out to communities, we can start off with a digital literacy course. But we also need to introduce these specialised courses, but the specialised courses should not be applied across the board. A specific community does data science for example. We should give them the opportunity to be able to apply their mind and actually see what the need in that particular community are. (R6)

The problem that we are experiencing is how these students once they have completed are able to apply their mind or apply their knowledge within their own communities and actually take advantage of the potential economic opportunities. (R6)

Theme 5: Lifelong Learning

The students who participated in this study all confirmed a desire for or had embarked on, a further learning journey post the NEMISA programme. This confirms the impact of the programme to enhance the lifelong learning drive and engage students in informative content that grasps their attention and fuels their desire for personal development.
The following were verbatim comments from the respondents:

I'm looking forward to National Diploma through NEMISA. (R2)

I'm in the process of completing many more courses through NEMISA and Coursera. (R2) Especially cybersecurity as a threat. That will be of course I need to focus on in terms of skill. (R4).

Background knowledge that we gather from the NEMISA helps us to be even more eager or to grasp information even faster. Or to be even more eager to learn even more in terms of our space. (R4)

Some students we've got started and did the digital literacy course and then moved on to actual university and did something else. (R12)

All of the students repsondents indicated that their awareness of the dynamic environment of their careers and the need to continuously develop their knowledge. It became apparent as the researcher probed further that the exposure to NEMISA was a critical spark that inspired the desire for the students to pursue other courses. The design of the shorter learning programmes and exposure to other platforms also played a factor in students respondents having an interest to develop other skills in line with their careers.

Theme 6: Partnerships

There are a number of initiatives that are driven toward improving digital literacy in South Africa. According to the respondents in this study, these initiatives are siloed in their attempts with minimum coordination, and this has a profound effect on having a consolidated view of the impact that these initiatives are having holistically. It seems there are policy directives that should be in place to ensure that these efforts from a public sector and private sector perspective are better aligned to a unified strategy that should be driving the strategy forward.

The following were verbatim comments from the respondents:

We even partnered with Correctional Services. Even the Northern Cape Co-lab, last year trained some prisoners. Here in the Eastern Cape, we have trained boxers and retired boxers. (R5)

There's quite a number of organisations that are doing some sort of literacy programmes. Some are linked to SETAs others with private institutions that are privately funded. (R6)

In terms of aligning for all the departments or for government institutions, NEMISA proposed a couple of years ago, a digital skills framework. This was from the University of the Western Cape. Essentially this framework was supposed to be the map for South Africa in terms of the digital skills that needed to be enacted within South Africa, and also the world of work. This would map out all digital skills within South Africa from 2022 up until I think 2030. Unfortunately, the digital skills framework in itself hasn't been approved as of yet. (R6)

What we have seen is that there isn't synergy across all programmes. In digital skills from all departments, certain departments are doing digital skills, how they see fit towards the audience or towards the constituencies and beneficiaries. (R6)

The British High Commission has worked recently with a number of Non-Profit Organisations (NPOs) within South Africa to implement digital skills in South Africa, and they also have their own annual targets. So, it's part of their initiatives in Africa. They also work with not only South African organisations but also African organisations for their own impact studies

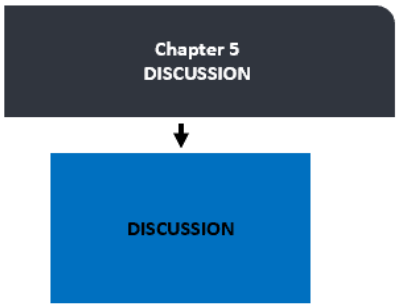
in digital literacy. Where the objective is to train 20,000 beneficiaries, I think within a year or so. And they started this initiative last year. And this is one initiative. Like many that are running currently within South Africa. The reason we know about some of the things that we were in contact because we've worked with some of these institutions before, and they get funding from various institutions like the British High Commission, like USAID, where they do various projects in South Africa. Essentially, if you align our programme with them, it would be almost the same. But their beneficiaries would be in, for example, maybe 10 municipalities within the Free State and maybe 10 within the Western Cape, and that would be their target market. Whereas our footprint is national, but you would have multiples of these programmes that are running in Southern Africa. And that also is part of the problem in a way in terms of coordinating all these programmes. And we make sure that our impact is actually national, and we can coordinate all these programmes across the board so that there is meaningful impact. So, it's one of the issues where there is not much coordination between all the organisations. Some of them we do know the programs, and we're well aware of them. Because we've worked with the institutions before, so we are able to communicate, but some of them we are not aware. It's only when we actually go into a community where we find out that now this has happened in terms of this particular project. And it's only after the fact that we have to reorganise ourselves and we coordinate towards finding other beneficiaries. (R6)

4.4 CONCLUSION

The influence NEMISA of digital literacy initiatives has been investigated with the administration of the interviews that were conducted. Fourteen respondents participated in the interview. Six of the respondents represented the student marginalised community and the eight other respondents represented industry role players comprising NEMISA stakeholders, employers and training authority.

The student respondents presented the researcher with the opportunity to assess the actual influence of the NEMISA digital literacy initiatives while the industry stakeholders assisted the researcher to have a holistic view from the institution and its programmes a=, secondly to get a view of the perceived value of students as experienced by the employer and furthermore the training authority and private sector initiatives that are aligned to similar initiatives.

The interviewed highlighted six key themes which comprised namely accessibility, E-learning, Economic viability, Future Skills, Lifelong learning and Partnerships. The aim of the chapter was to share some of the insights through expressed responses from the respondents while also identifying common patterns that were prevalent from the interviews conducted. Though this approaches the researcher highlighted the key themes with their alignment to the objectives of this research study.


Chapter 5
DISCUSSION
DISCUSSION

CHAPTER 5. DISCUSSION

Specific themes about the influence of NEMISA's digital literacy initiatives were uncovered in the research. Indications of alignment of the insights from the interviews linked to research propositions, research questions and the theoretical frameworks were sought and further unpacked in this chapter.

The research proposition is stated below:

- NEMISA's digital Literacy program is ineffective in achieving development outcomes.
- Digital literacy is a critical enabler of lifelong learning and empowerment and employability.
- Digital literacy improves viability in the information society and digital economy.

Based on the feedback gathered from the respondents to this study, there are positive benefits derived from the NEMISA Digital Literacy initiatives.

Amongst the students who were interviewed, it became apparent that the influence of NEMISA Digital Literacy initiatives was profound and highly effective. Most of the students credited their training as a key factor in having the opportunity to acquire gainful employment. This has also led them into specialised opportunities in the broadcast sector which is a field they would not have pursued initially. The feedback from the employer and testimonials from the trainer further supplement the effect that these initiatives have had in marginalised communities. This research aligns with Heeks' (1999) assertion that ICT is a valuable vehicle to access various employment opportunities for the poor and to promote sustainable human development.

The results indicate a positive influence of NEMISA's digital literacy programme in assisting learners in terms of exposure to job or business opportunities.

The feedback from the employers based on the assessment of NEMISA graduates indicates that NEMISA students are perceived to be ready for the world of work.

NEMISA respondents also echoed the same message in regard to helping learners to become entrepreneurs not only employees. One such course that has been initiated by NEMISA is a cell phone repair course. Students will be able to take plus-minus three months to complete the course in total. After the training, they will get a cell phone kit and they will be able to actually go out and start the business immediately. NEMISA assists them with the tools to start their own business and actually apply the skills within the work environment. Furthermore, NEMISA is set to leverage the current digital terrestrial migration by running a course in digital terrestrial television. With efforts currently underway to align the course to the National Qualification Framework (NQF). NEMISA is aiming to bridge the gap in terms of skills to assist with installations that are expected to be national backed up with the ability to manage and maintain. Through this programme, learners will be learning all these tools and skills which then they can go out and apply in their own community Post the digital migration has been completed and learners can start businesses with the skills they have learnt. NEMISA is looking to create skill sets where learners can actually start applying them in their own communities immediately as a business opportunity.

Individuals' education levels have been identified as an essential factor affecting digital skills (Hargittai, 2002; Gui, 2000). Bejakovic and Mrnjaval (2020) state that the difficulty in this modern society is in ensuring citizens is digitally connected. UNESCO's Global Declaration on Connectivity for Education (2021) has three key principles that drive its mandate, and these are:

Principle 1: Centre the most marginalised;
Principle 2: Expand investments in free and high-quality digital education content; and
Principle 3: The digital transformation of education requires pedagogical transformation.

Students that took part in this study were exposed to NEMISA through their tertiary institutions. While it may seem counter-intuitive to target tertiary students with digital literacy initiatives due to their access to tertiary institution facilities such as libraries, computer labs and internet connectivity, the students felt the NEMISA initiative was specific to their needs in terms of starting the journey towards specialised skills. However, this tilted favourably

towards students that had been exposed to some form of computer literacy as most tertiary institutions have a computer-oriented module to introduce students to the use of computers. Rural communities and marginalised communities present challenges to factors such as limited connectivity and limited access to computers, laptops or smartphones. However, NEMISA has endeavoured to reach these communities by offering access to digital literacy even to an extent of doing house-based training in rural communities. In this effort, they also adapted the digital literacy programme to a mobile digital literacy programme to accommodate the lack of computers and laptops. The measurement of positive benefit for marginalised communities is through testimonials and feedback that trainers receive. This presents a challenge in quantifying the impact that the initiatives are having as post the training there is no tracking done to identify the actual impact of the interventions. However, NEMISA will be doing an impact assessment study to ascertain this gap that exists in the current process, as no mechanism or tool is in place at the moment to quantify the actual impact.

A study by Maulikkamdar (2009) further supports a solution to the growing access divide that the provision of computers, internet access and training for novice users at public access points, could alleviate. Cognisance should be placed on ensuring adapted content in the form of readability and graphic usage as these are necessary to ensure ease of adoption, as not addressing these factors can lead to low adoption of the intervention. Maulikkamdar (2009) supports the use of cell phones as an alternative for accessing the internet. ICT4D initiatives are aligned to this proposition by Maullikkamdar (2009), whereby ICT development projects drive the penetration of ICT equipment through telecentres in rural and marginalised communities.

Student respondents were not hampered by issues of access due to proximity to facilities. In their case, they were exposed to university facilities. This is further highlighted by Hababija-Razanila and Mekic's (2021) study which investigated the relationship between digital literacy on employment status and education level. The study concluded that education level is statistically significant for digital literacy. Higher levels of education correlated positively with digital literacy. The opportunity to study this further in the South African context is important as the unemployment rate in the country is significantly tilted more towards those who have not completed matric. The purpose would be to ensure proper

classification of marginalised communities so that the efforts are targeted at the correct beneficiary groups to lessen the impact of duplication of efforts.

NEMISA has also embarked on programmes to train digital literacy in high school children at the Grade 12 level, particularly in those rural areas, so that they can apply for schools. Some of the initiatives include training people in their homes with one of the major challenges being access to the internet and data however this has been circumvented by trainers bringing along Wi-Fi routers to enable people to gain access to the internet. Supplementing initiatives are the youth employment initiative whereby all government departments are taking on interns.

According to UNESCO, digital literacy must be different in the 21st century. It further sheds light on children born in the digital age requiring a reconsideration of our priorities regarding which ICT skills to develop. A concept of digital literacy for the future becomes a topical agenda that requires urgent attention. The Department of Communications (2020) strategy will assist South Africa with this prioritisation by focusing on:

1. A diverse skillset;
2. Priority skills area; and
3. Convergence of digital skills with subject matter experts

UNESCO (2015) proposes that universal access to education is an incomplete project due to prevalent situations of inequalities in access, completion and learning. The report further states that to attain the goals of Education 2030, where the objective is ending poverty and building a peaceful and environmentally sustainable world, equity in quality education and provision of lifelong learning opportunities are important means to an end.

NEMISA is providing training to the 1000 student assistants that the Department of Education will deploy across all the schools. Furthermore, is the target to end up with about 280,000 students from the Department of Education alone being trained by NEMISA. Other initiatives include projects with the Department of Home Affairs, and Military Veterans with

some employees from the Department of Communication and Digital Technology already using the NEMISA portal for training.

The interviews confirmed the positive value derived across the board by all participants in the study. As per the responses from the students above, some of the beneficiaries were driven by different motivations to gain entry into NEMISA and digital literacy was not the initial draw card that motivated their participation. A theme that would need further investigation is the impact of the media and electronic programmes on digital literacy uptake. Students also highlighted the importance of having access to NEMISA's facilities such as studios and having former graduates conducting the lessons provided an enriching experience.

According to Lee (2014), Individuals lacking digital literacy skills remain excluded from the digital world. Digital literacy education is of key importance for those lacking digital literacy as it supports learners' knowledge and skills construction through education and practices to enhance their digital literacy (Lee, 2014).

UNICEF (2017) states that government institutions and the private sector can support digital literacy training through complimentary online services and technology offerings, whereby such initiatives can lead to zero-rated platforms for learning or provision of free devices while ensuring the safety of internet surfing. These programmes should ideally be freely available for mass adoption. NEMISA's online platform is aligned to UNICEF's position in this regard as they have the learning platforms that they have launched that are zero-rated and which can lead to increased uptake of the courses offered by NEMISA.

Student respondents in this study differed in terms of the medium of instruction that they experienced. Two of the six students had used online platforms to gain access to NEMISA courses and of the two, one has embarked on further studying with one of NEMISA's partners, called Coursera. The other students were exposed to physical classroom interactions. The rural community interventions were also conducted in physical settings. UNESCO (2021) proposes hybrid learning settings to have a balance between online as well as physical settings for studying. This also would be ideal in NEMISA's case as different

communities have different situations that require NEMISA to be flexible in how training is conducted.

Educational systems must adapt their curricula to align with new market demands and this is perpetuated by the extensive use of digital technologies for learning which COVID-19 accelerated, leading to a need to enhance the learners' and teachers' digital skills (Voda et al., 2022). An inability to gain, or lack of, digital literacy means that remote learning opportunities would not be able to cater for the marginalised. It becomes more important to ensure sufficient access for the marginalised to acquire these skills in order to take advantage of platforms such as NEMISA's zero-rated learning platform. This is given further impetus as student respondents indicated their ambitions to study further and engage in lifelong learning. Platforms that offer free access to learning are a key solution to further enhancing digital skills.

Basargekar and Singhavi (2017) list the following benefits of digital learning:

- Ensures inclusivity in education;
- Enhances quality of learning;
- Access to quality materials and content for students; and
- Enhances learning methods leading to teacher effectiveness.

The opportunity to address economic exclusion for South African marginalised communities' rests on the ability to leverage opportunities provided by digital learning.

UNESCO (2020) outlined the impact that COVID-19 has had in accelerating digital transformation while also disrupting the labour market due to the fourth industrial revolution, with technologies such as Automation, Artificial Intelligence and other technologies driving this disruption. This UNESCO report highlighted the fact that over 2 billion people globally work in the informal economy, particularly in developing economies. This further enhances the call for decent work aligned with the UN SDG 8.

The results suggest that majority of participants feel that they have gained economic viability having been exposed to NEMISA digital literacy training. They also highlighted that due to the exposure to NEMISA digital literacy they have been able to start a journey towards further development through other much more specialised courses.

These results are supportive to some previous studies which indicated sentiments such as:

- Digital literacy improves employability as employers are looking for candidates who demonstrate basic ICT skills (UNESCO, 2011).

- ICT can contribute to the development goal by accelerating SDG target 4.4 digital literacy, which focuses on relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship among the youth and adults (UNDP, 2022).

- Innovation in teaching should be more than just new technologies but should include the adoption of newer simplified means to promote lifelong learning and equity (UNICEF, 2022).

The results of this study indicate that students are not a cognisant of the value of digital literacy to they understand that it is a key foundational skill to thrive in the fourth industrial revolution. This is supported by the view of the NEMISA e-Learning Head who through the roll out of the training programme focus on digital literacy as an entry programme and through successful completion students will be exposed to other more specialised programmes.

The following propositions were explored by the researcher:

Proposition 1. NEMISA's digital literacy programme is ineffective in achieving development outcomes

Proposition 2. Digital literacy is a critical enabler of lifelong learning and empowerment and employability

Proposition 3. Digital literacy improves viability in the information society and digital economy

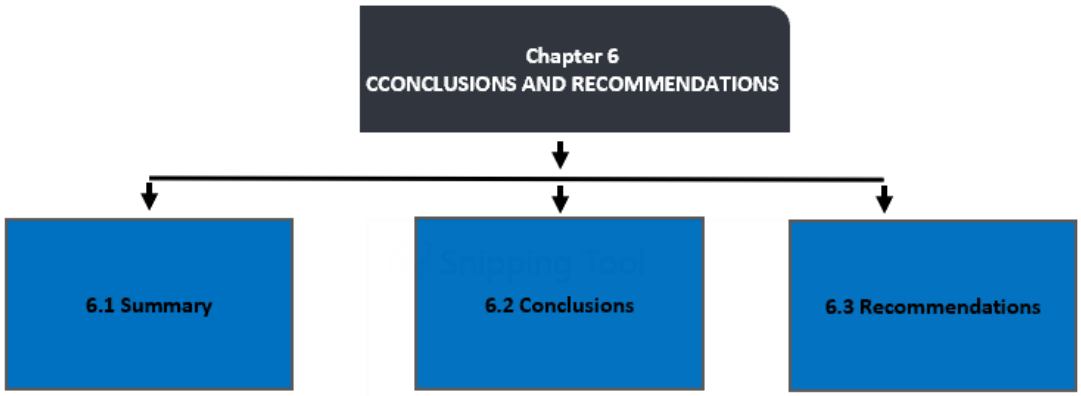
The results of the study confirm that proposition 1 is incorrect as the outcomes of the

interview prove that NEMISA digital literacy initiatives are effective in achieving development outcomes.

- The results obtained from the respondents however indicated the challenges faced by NEMISA to reach more individuals who are not in tertiary institutions however due to the roll out of mobile digital literacy initiatives that this is being address even though challenges exist in access to technology, broadband , funding and knowledge.

- The results from the interviews also support proposition 2 which supports previous research confirming digital literacy is a critical enabler of lifelong learning and empowerment and employability. This could be as a result of the programme design which is short delivery mode and the exposure to other NEMISA programmes due to this training.

- The results from the interviews also support proposition 3 which supports previous research confirming digital literacy improves economic viability. Students respondents have been able to grow either through gainful employment, being perceive to be work ready , ability to improve resumes and apply for opportunities and being able to pursue further learning


Chapter 6
CCONCLUSIONS AND RECOMMENDATIONS
6.1 Summary
6.2 Conclusions
6.3 Recommendations

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY

The influence of digital literacy on the economic viability of individuals and the economy is crucial for success in the information society. The accelerated speed of technological advancement and the impact it has on the workplace of the future warrants attention from all stakeholders to prioritise digital skills that are aligned with the evolution of technologies. Education content, learning delivery and the curriculum have to adapt to this advancement in technology in order to ensure that students, marginalised communities, teachers, those employed, employers and entrepreneurs can successfully participate and use ICT to advance livelihoods and economies.

6.2 CONCLUSIONS

Students who have been impacted by initiatives related to NEMISA have benefited from this programme through soft skills, practical experience, access to facilities, access to experts and enriching content that has significantly improved their chances for economic viability. NEMISA's marginalised community initiatives such as mobile digital literacy programmes highlight NEMISA’s ability to adapt to differing needs in different communities. The zero-rated e-learning platforms have had an uptake symbolising the immediate impact that technology has had; this should encourage NEMISA to scale the initiative to broaden the footprint of impact. Interviewees shared the benefits they have attained from all perspectives; including the end customer the students, the employers, the trainers and the industry training authority.

The motivating factors that lead to initially interacting with NEMISA and the exposure to its programmes, however, differ and this requires further attention in identifying the needs from the user perspective in order to appeal to their requirements and then expose them to digital literacy content.

Accessibility is one of the major obstacles to the delivery of digital literacy initiatives. Access to enabling infrastructures such as broadband connectivity, hardware and software tools,

learning facilities such as telecentres and libraries, smartphones and tablets, disability-friendly technology, quality content and skilled educators and trainers, are barriers to the mass impact of digital literacy initiatives. Partnerships can play a role in minimising the impact that accessibility has on the roll-out of the digital literacy programmes supplemented by a policy framework that is geared toward uplifting marginalised communities.

Student respondents as representative of the target beneficiaries for NEMISA's digital literacy initiatives lauded the impact that NEMISA has had in accelerating their economic participation through the practical approach of their course delivery. This was exemplified in getting gainful employment post the NEMISA programmer, work readiness preparation and entrepreneurial impetus. The intended user group also felt NEMISA sparked the desire for lifelong learning.

In order to thrive in the information society, digital literacy is a basic skill one requires which can facilitate the further enhancement of digital skills. Emergent technologies such as AI, Robotics, Machine Learning, Block Chain and Automation are pervasive in the workplace of the future. To become relevant in the digitally inclined workplace of the future and to take advantage of emergent technologies and the opportunity they present requires a focus on acquiring 21st-century skills.

The finding from this study reveals that the participants were aware of the opportunities and had begun their journey towards acquiring skills in line with future skills for the information age. Digital literacy is a vital cog to start the wheels turning towards lifelong learning particularly specialised digital skills.

The drop-out rate of students in South Africa before completing matric is alarmingly high. Those who do not complete matric lead to inflating the unemployment rate causing further strain on the economy and government to create jobs. In the 21st-century skills classification, they would become unemployable and therefore rely on the government’s assistance to survive. This would be due to a lack of digital literacy skills as research from Bejakovic and Mrnjaval (2020) emphasises the strong relationship between education level and digital literacy skills to function optimally in the information society. Therefore, re-imagining curricula from all levels of education from basic through to tertiary level and on-

the-job training are critical to ensure that digital literacy is prioritised. Digital literacy has indeed become a basic life skill that one requires to survive.

The delivery of the teaching and learning experience has been disrupted, especially during the ongoing COVID-19 pandemic. Technology played a significant role in ensuring that learning could continue from a remote learning perspective. This saw the resurgence of e-learning platforms as a testament to this increased demand for technology-enabled learning. Consequently, this has presented an opportunity for solving some of the systematic issues in South Africa's education system such as access to quality education, education inclusion, access to quality content, access to learning groups and stimulating graphic and video content. Thus e-learning has revolutionised how education can be enhanced through new mediums of information which supplement teacher and classroom environments.

The NEMISA e-learning platform which has been activated within the last 12 months, has seen a significant scale up in terms of demand as more and more people are able to access their content. E-learning can assist in bridging digital literacy gaps from basic to higher education institutions and this has seen corporate companies also implement it for training and development. This supports the notion that using e-learning is a double-edged sword as on one side you can teach digital literacy while simultaneously introducing the learner to the tool which has a massive impact in terms of retention of lessons learnt. The other added benefit that e-learning provides is the data that it can provide.

NEMISA is currently unable to quantify the impact of its initiatives as there is no mechanism in place to measure it; however, with the e-learning platform, this data immediately becomes available. Data on the users, their demographics, their area of residence and the course content consumption, as well as proficiency, is readily available and this can assist in strategising for future interventions.

NEMISA's approach to the delivery of its programmers is aligned with the Broadband Commission (2021), which proposed hybrid learning as a solution to build the information society. This would be ideal in the South African context as there are nuances that are particular to certain rural areas, certain courses and certain user groups that require adaptation of models to deliver content. One of these nuances is broadband connectivity. Although the efforts by NEMISA in a striking partnership that have led to the zero-rating of

their e-learning platform is a great first step, there is a need for the broader community of stakeholders like telecoms companies to supplement broadband infrastructure on the ground for people to be able to access the internet.

The balance between physical and online learning would be conducive to better education as one of the measures that NEMISA has put in place includes the drive to increase course completion rates on the e-learning platforms and thus they could allocate independent facilitators in the field for the targeted users, to assist them on the portal and thus the hybrid learning model is ideal for such cases. It is also ideal in the instance where NEMISA facilities can only accommodate a certain number of students which in the past would have meant a minimum number of students to be trained; however, with the hybrid model, it becomes an easier exercise to deliver to more students while allowing reasonable access to facilities of learning.

One of the key enablers for NEMISA to roll out their e-learning platforms is through partnerships with organisations such as Microsoft. However, in terms of the impact of digital literacy initiatives in the country, it is not easy to quantify the impact. This is due to multiple organisations running their own digital literacy initiatives. It leads to duplication of efforts and in certain cases even wastage of resources or under-utilisation of capacity. A coordinated approach would limit the siloes and ultimately lead to quantifiable data and continuous monitoring. The value in being able to have a consolidated view of digital literacy initiatives is the ability to address the gaps, adjust the strategies and identification of blind spots and variables that are not in plain sight and which may lead to bottlenecks.

6.3 RECOMMENDATIONS

1. Digital literacy to be introduced at basic, secondary and tertiary education levels

   Digital literacy is an important basic life skill for survival in the information society. However, it does not guarantee employment as it is intended to be an introduction to digital skills. It is only when students in target marginalised communities take the added step of progressing past the introductory course and studying other specialised courses that opportunity for gainful employment and entrepreneurship comes to the fore. It is therefore recommended that learning pathways that lead to further exploration of

specialist digital skills be deliberate in their attempts to attract marginalised target groups. This can be in the form of soft incentives that students can be attracted to stretch themselves beyond the introductory course.

2. NEMISA to be instituted as a digital literacy training hub

Policymakers must drive a coordinated approach to roll out digital literacy initiatives. The siloed approach of various entities in the digital skills drive though may seem to suggest “all hands on deck” due to the number of initiatives being run, however, there are various benefits that can be leveraged by being more cohesive as an industry and thus leading to better strategies of rolling out programmes that may address the challenges on the ground much more holistically. NEMISA as an organ of the DCDT can play the integrator role by bringing all stakeholders to the centre and aligning initiatives to feed into the Digital Skills of The Future Strategy of the Department thereby ensuring that the industry speaks in one voice and thus a better understanding of digital literacy would be derived from these coordinated efforts. The policy must provide a directive of how these initiatives should be run and the stakeholders that should be involved so that on the ground the impact can be quantified not only from the skills perspective including initiatives that assist on the hardware, software, connectivity and content perspective.

A coordinated change management programme driven by an Executive sponsor such at the DCDT amd NEMISA would ensure that the is a clear change strategy in place with all various components to move the digital literacy state from the as-is to the to-be state. The programme should be driven at ensuring that components such as a clear communication strategy, marketing and well as training is in place. It could also facilitate tools such as websites, publications, magazines, social media platforms and events and incentives are in place to drive uptake of the digital literacy programmes

3. E-Learning to be introduced right across all educational levels

e-Learning has provided an opportunity to scale the impact of digital literacy initiatives as there is no reliance on physical resources from a trainer or facilitator perspective and the limitation of facilities is reduced. A key recommendation is ensuring that digital literacy on e-learning platforms such as NEMISA is rolled out to schools from basic to

higher education. The platform is zero-rated which means that they should be no limitation in terms of the number of students that can access the platform. It thus poses the need to update the curriculum to include digital literacy from the foundation to tertiary education.

4. Development of citizens digital literacy

   Upskilling people for the digital economy and livelihood requires a holistic view from a stakeholder perspective. It appears focus is only looking at learners already in the educational systems either at primary, high school and tertiary. However, there seems to be no holistic plan for upskilling citizens in order to enable digital government and civic services such as e-health, e-government. A consolidated approach whereby the individuals stakeholders impacted by the digital revolution are well catered for and programmes are designed for them to ensure that every one is included in the digital economy.

5. Well defined and design digital literacy curriculum standard

   International organisations embarking on ICT4D projects and the like have to have an interest in the uptake of digital literacy skills so as to ensure that the projects that are implemented are successful. Training in line with the curriculum for digital skills is critical to ensure success of these projects. Therefore, these organisations need to find ways to connect to government initiatives to ensure sustainability and impact for their projects.

6.4 Future Studies

1. Academia

The researcher recommends other theoretical frameworks such as capabilities approach and sustainable livelihoods to assess the influence of digital literacy initiatives on improving the lives of citizens. Sen's capability theory is based on the premise that social arrangements evaluation must be based on the extent of people to obtain freedon and achieve functions they value (Robeyns, 2011). It addresses the issue of quality of life. This is particularly important in the context of this study as economic viability must be based on the premise that it is valuable to the individual to whom it is derived. Digital

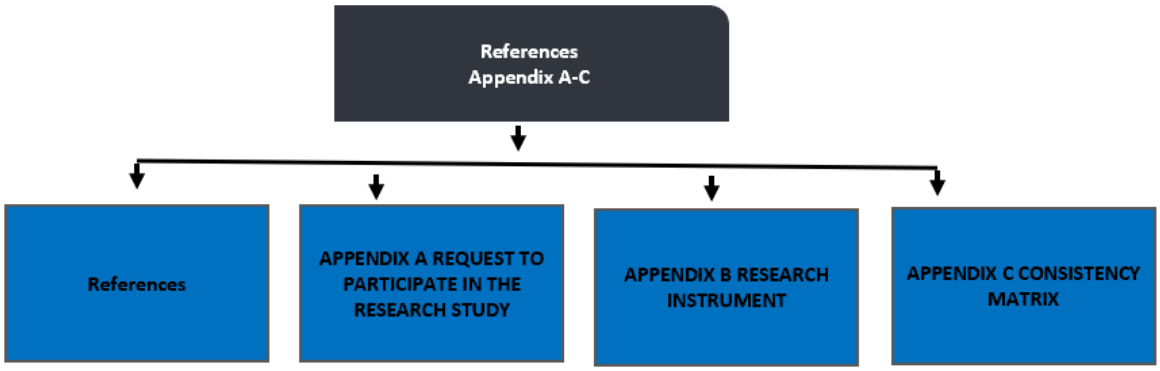
literacy according to this study does lead to an opportunity to apply, get job opportunities and start businesses however the quality of life as derived by the learner must be assessed.

The other theoretical frameworks that can be undertaken as a study include the Sustainable Livelihoods framework. This Framework is concerned with livelihoods of poor people and the complexity of opportunities and constraints they are facing (Serrat, 2017). In the context of South Africa, implementing digital literacy or digital skills programmes must take into account the context of poor people as most interventions are only skimming the surface of the actual scale of issues faced by them. It is intended that the digital literacy initiatives will add value particularly to poor backgrounds however the studies placing people from such backgrounds at the centre are minimal.

2. Government

The researcher also proposes future studies to delve into the convergence of technology and impact of technologies on Government services. In the context of the study, it appears multiple government entities are running some sort of initiative intended at upskilling for the fourth industrial revolutions. However, the impact of converging technologies has an impact on how government should conceptualise how the roll out programmes as the are multiple touchpoints which have an impact on how government works together and delivers across the different state departments and entities.

Recent programmes such as AI and Robotics have received National Qualification Framework approved . This study can assist in looking at the multiliteracies theoretical framework in terms of curriculum and learning design. Future studies can be directed at the cultural , multimodal delivery of such programmes to ensure the user centricity is factored into the delivery of such and future programmes.


References
Appendix A-C
References
APPENDIX A REQUEST TO PARTICIPATE IN THE RESEARCH STUDY
APPENDIX B RESEARCH INSTRUMENT
APPENDIX C CONSISTENCY MATRIX

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APPENDIX A: REQUEST TO PARTICIPATE IN THE RESEARCH STUDY

Good day

My name is Letlotlo Moleko and I am a Master's in Management Digital Business at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating research titled **"The influence of digital literacy initiatives in Johannesburg. A NEMISA case study"** under the supervision of Ashraf Patel. The aim of this research project is to find out the following:

- This research aims to unpack the influence of digital literacy initiatives.
- This research will also aim to explore how NEMISA one of the key state initiatives, the role has been leveraged to drive digital literacy in targeted marginalised communities.

As part of this project, I invite participants to take part in an interview. This activity will involve a virtual interview and will take around 45-60 minutes. With your permission, I would also like to audio/video record the interview using a digital device. This recording will be stored in a password-protected multimedia file and only the researcher will have access to this recording. It will be deleted after 1 year.

There will be no personal costs to participants in this project, there are no direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. Participants may withdraw at any time or not answer any question if they do not want to. The interview will be completely confidential and anonymous and the information will be held securely and not disclosed to anyone else.

If you have any questions during or afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you. With your permission, the data collected from this research project may be used by other researchers in an anonymized format. If you feel you have been harmed in any way by participating in this study or you have any concerns, you are welcome to contact Wits Business School, telephone +27(0) 11 717 1408, email Ayanda,magida@wits.ac.za,

Your participation will be highly appreciated.

Researcher:
Mr Letlotlo Moleko, 0506872t@students.wits.ac.za, 0731362535
Supervisor:
Ashraf Patel, baobabknowledge@gmail.com,

Kind regards

Letlotlo Moleko
0506872T
0506872T@students.wits.ac.za

APPENDIX B: RESEARCH INSTRUMENT

i. What has been the impact of NEMISA's digital programs in beneficiary communities?

- What are the stand-out outcomes that were derived from participating in the digital program?
- Why do you think the digital program was aligned to the needs and how was it addressed?

ii. Does access to NEMISA's digital literacy program improve economic and job opportunities?

- How has participation in the digital program expanded the opportunity to access business or employment opportunities?
- Explain when economic deprivation prior to exposure to the digital program was experienced and how the program changes these prospects

iii. Has digital literacy learning been activated beyond NEMISA programs in beneficiary communities?

- Please elaborate on examples of value derived beyond the administrating of the programs for students, employers, educational institutions, and government partners.

APPENDIX C: CONSISTENCY MATRIX

RESEARCH PROBLEM: To explore the influence of the National Electronic Media Institute of South Africa (NEMISA)'s digital literacy as part of a skills programme and its effectiveness in targeted marginalised communities.					
Sub-problem	Literature review	Propositions	Sources of data	Type of data	Analysis
For South Africa to remain competitive in the global market the digital skills conducive to success in the information society need to be promoted.	(Frost & Sullivan, 2019).	NEMISA's digital Literacy programme is ineffective in achieving development outcomes.	Structured interviews Literature reviews	Qualitative data	Descriptive analysis inductive thematic content analysis
Digital literacy initiatives provide the impetus for lifelong learning in digital specialised skills.	Heeks (1999) Bejakovic and Mrnjaval (2020) Basargerka and Singhavi (2017)	Digital literacy is a critical enabler of lifelong learning and empowerment and employability	structured interviews	Qualitative data	Descriptive analysis Inductive Thematic analysis
Digital literacy is a minimum required for one to gain the opportunity for employment.	Webster (2003),) Nath (2017)	Digital literacy improves viability in the information environment and digital economy.	Structured interviews	Qualitative data	Descriptive analysis Inductive Thematic analysis