DEVELOPMENT OF AN ADOPTION MODEL OF DIGITAL SERVICES FOR UNEMPLOYED YOUTH IN AN INFORMAL SETTLEMENT IN NAMIBIA

By

Asnath Paula Kambunga, 200833685

Thesis presented in fulfilment of the requirements for the degree of

Master of Informatics, at the

Namibia University of Science and Technology

Supervisor:

Prof Heike Winschiers-Theophilus

Date of Submission: April 2018

METADATA

TITLE: Ms

STUDENT NAME: Asnath Paula Kambunga

SUPERVISOR: Prof. Heike Winschiers-Theophilus

CO-SUPERVISOR:

DEPARTMENT: Informatics

QUALIFICATION: Master of Informatics

SPECIALISATION: Informatics

STUDY TITLE: DEVELOPMENT OF AN ADOPTION MODEL OF DIGITAL SERVICES FOR UNEMPLOYED YOUTH IN AN INFORMAL SETTLEMENT IN NAMIBIA

MAIN KNOWLEDGE AREA: HCI

KEYWORDS: Adoption, Informal settlements, Digital services, Job matching, TAM, TPB, Theory of Reasoned Action (TRA), Action Research, Technology adoption

TYPE OF RESEARCH: Applied Research

METHODOLOGY: Action Research

STATUS: Thesis

SITE: Windhoek

DOCUMENT DATE: April 2018

SPONSOR (or Cluster/ Research lab): Community Lab @ NUST

Declaration

I, Asnath Paula Kambunga, hereby declare that the work contained in thesis, entitled: (Development of an Adoption Model of Digital Services for Unemployed Youth in an Informal Settlement in Namibia), is my own original work and that I have not previously in its entirety or in part submitted it at any university or other higher education institution for the award of a degree.

I further declare that I will fully acknowledge any sources of information I will use for the research in accordance with the Institution rules.

Signature:..... Date:.....

Retention and Use of Thesis

I, Asnath Paula Kambunga being a candidate for the degree of Master of Informatics accept the requirements of the Namibia University of Science and Technology relating to the retention and use of theses deposited in the Library and Information Services.

In terms of these conditions, I agree that the original of my thesis deposited in the Library and Information Services will be accessible for purposes of study and research, in accordance with the normal conditions established by the Librarian for the care, loan or reproduction of theses.

Signature:..... Date:.....

ABSTRACT

Youth unemployment has become an increasing socio-economic issue in Namibia. Thus, numeral initiatives have been started to fight this trend in order to empower the current marginalised and unemployed youth to sustain a livelihood. This includes skills training opportunities, services and technology development. However, the adoption and integration of such services and technologies has not always been successful. Consequently, this study aims to investigate and implement an appropriate adoption model for youth services in Namibia. Different existing technology adoption models were evaluated in relation to the context of marginalised youth in urban areas, especially informal settlements of Windhoek. For the purpose of this study, youth from the Havana informal settlement were involved in designing and assessing technologies and services suitable to them, at the same time as the development of the proposed technology adoption strategy. The technology adoption strategy was adapted alongside the successful deployment of NamStarter a crowdfunding system for social entrepreneurship initiatives in Havana. An action research methodology was used as the approach to carry out the research and interventions. Based on our empirical results we argue that an appropriate technology adoption model in the context of informal settlements does not rely on the assumption that users pre-formulate intent before an action, as framed in the theory of reasoned action, which has been the basis for many mainstream technology adoption models. Contrary we propose a technology adoption model relying on behaviour or technology use prior to attitude change. The model emphasises factors of social influence and enablers creating capabilities as the main drivers for technology adoption in informal settlements.

TABLE OF CONTENTS

ABSTRACT IV
LIST OF FIGURES VIII
LIST OF TABLES IX
LIST OF ABBREVIATIONS X
ACKNOWLEDGEMENTS XI
CHAPTER ONE 12
1. INTRODUCTION AND BACKGROUND 12
1.1 Introduction 12
1.2 Research context 13
1.3 Research problem and aims 14
1.3.1 Problem statement 14
1.3.2 Research Objectives 15
1.4 Benefits of the study 16
1.5 Thesis structure 16
1.6 Key Concepts and Definitions 16
CHAPTER TWO 18
2. LITERATURE REVIEW 18
2.1 Introduction 18
2.2 Youth unemployment 18
2.3 Youth living in the informal settlements and their access to services 20
2.4 Social entrepreneurship and crowdfunding 21
2.5 Technology adoption models 22
2.5.1 Technology Acceptance Model (TAM) 22
2.5.2 Motivation Model (MM) 23
2.5.3 Theory of Reasoned Action (TRA) 24
2.5.4 Theory of Planned Behaviour (TPB) 25
2.5.5 Innovation Diffusion Theory 25
2.5.6 The Unified Theory of Acceptance and Use of Technology (UTAUT) 26
2.5.7 Mobile Phones Technology Adoption Model (MOPTAM) 27

2.5.8 Atheoretical related studies 28
CHAPTER THREE 31
3. METHODOLOGY 31
3.1 Overview 31
3.2 Methodological approach 31
3.3 Research Design 32
3.4 Participants' engagement 34
3.4.1 Participants' recruitment 34
3.4.2 Forms of Engagements 34
3.4.3 Ethical considerations 34
CHAPTER FOUR 36
4. ACTION RESEARCH CYCLES 36
4.1 Chapter overview 36
4.2 Cycle 1: Designing the adoption strategy 36
4.2.1 Cycle 1, Diagnosis 1 36
4.2.2 Cycle 1, Action planning 1 41
4.2.3 Cycle 1, Action 1 48
4.2.4 Cycle 1, Evaluation 1 56
4.2.5 Cycle 1, Reflection 1 57
4.3 Cycle 2: Refining adoption strategy 58
4.3.1 Cycle 2, Action Planning 2 58
4.3.2 Cycle 2, Action 2 59
4.3.3 Cycle 2, Evaluation 2 65
4.3.4 Cycle 2, Reflection 2 69
4.4 Cycle 3: Establishment of the adoption strategy 70
4.4.1 Cycle 3, Action planning 3 70
4.4.2 Cycle 3, Action 3 72
4.4.3 Cycle 3, Evaluation 3 77
4.4.4 Cycle 3, Reflection 3 82
CHAPTER FIVE 84

5. DISCUSSIONS AND PROPOSED MODEL 84
5.1 Revisiting factors 84
5.2 Rethinking underpinning theories 86
5.3 An appropriate technology adoption model 87
CHAPTER SIX 90
6. CONCLUSION 90
6.1 Summary 90
6.2 Future work 91
REFERENCES 92
APPENDIXES 102
1. Questionnaire: Diagnosis 102
2. Organisations and services identified 125
3. Focus group action plan 128
4. Commitment session Questionnaire 129
5. First training programme: 24 April-26 April 129
6. Evaluation Questionnaire : C2:E2 132
7. Registration form C3;AP3 134
8. Second training programme : Refining the adoption strategy 136
9. Informed Consent Form 138

LIST OF FIGURES

Figure 1: Havana Informal settlement 14
Figure 2: Technology adoption model (Davis, 1986) 23
Figure 3: Theory of Reasoned Action Adapted from (Fishbein and Ajzen, 1975) 24
Figure 4: Theory of Planned Behaviour Adapted from (Ajzen, 1991) 25
Figure 5: UTAUT, Adapted from (Venkatesh, Morris, Davis, & Davis, 2003) 27
Figure 6: MOPTAM adapted from Biljon & Kotzé (2007) 28
Figure 7: Action Research cycles 32
Figure 8: reasons for eWallet service 39
Figure 9: The proposed adoption mode 46
Figure 10: Adoption strategy on a flip chart paper 49
Figure 11: The developer (wearing glasses and a blue shirt) explaining how the system works to the ambassadors 50
Figure 12: NamStarter homepage 51
Figure 13: NamStarter User Case adopted from (Lungameni 2016) 51
Figure 14: NamStarter registration page 52
Figure 15: The ambassadors being trained on how to use NamStarter 53
Figure 16: Poster calling all youth to sign up 54
Figure 17: Poster in Oshiwambo 54
Figure 18: Social media campaign 55
Figure 19: The Facebook page 56
Figure 20: Refining the adoption strategy 57
Figure 21: Main goal surrounded by individual goals 59
Figure 22: Ambassadors goals 60
Figure 23: Obstacles 61
Figure 24: Redesigned poster 62
Figure 25: Poster designed on a computer 63
Figure 26: The youth receiving assistance with their projects by the researcher (woman) 65
Figure 27: Individual goal Vs Group goal 67
Figure 28: Action Plan to establish an adoption strategy 71

Figure 29: Front of the nametag 74
Figure 30: Back of the nametag 74
Figure 31: Ambassadors receiving their forms and tags 75
Figure 32: Training day 1 76
Figure 33: RLabs Assistants with the youth 77
Figure 34: Ambassadors Round two (2) 78
Figure 35: Graphical representation of ambassadors and the youth invited 79
Figure 36: Ambassadors and participants 79
Figure 37: Over view of projects on NamStarter 81
Figure 38: NamStarter statistics 82
Figure 39: Social cognitive theory adopted from Bandura (1986) 87
Figure 40: proposed adoption model 88

LIST OF TABLES

Table 1: Phases of action research explained 34
Table 2: Systematic review results 43
Table 3 : Factors influencing adoption 44
Table 4: Relationship between the factors and the strategy explained 47
Table 5: Adoption time schedule 48
Table 6: Individual goal Vs reality 66
Table 7: Number of people invited and medium used 68
Table 8: Ambassadors attendance 69
Table 9: Factors affecting adoption for Havana youth 84
Table 10: Organisations and services identified 128

LIST OF ABBREVIATIONS

AR – Action Research

ICT – Information Communication Technology

ICT4D- Information Communication Technology for Development

NSA – Namibia Statistics Agency

NUST – Namibia University of Science and Technology

OPM – Office of the Prime Minister

RLabs – Reconstructed Living Labs

TAM – Technology Adoption Model

UTAUT – Unified Theory of Acceptance and Use of Technology

MOPTAM – Mobile Technology Adoption Model

MM – Motivation Model

TRA- Theory of Reasoned Action

TPB- Theory of Planned Behaviour

4G- Fourth Generation

ACKNOWLEDGEMENTS

Firstly, I would like to thank God for blessing me with wonderful people who supported me throughout my research. My profound appreciations go to my supervisor Prof. Heike Winschiers-Theophilus, for taking me through this journey. Prof. Winschiers-Theophilus nurtured and immensely shared her knowledge allowing me to increase my research skills, at the same time steering me in the right path. I am grateful for her time and dedication and I could not wish for another supervisor. I would like to thank my fellow students research team in Havana for always availing their time to help. Specifically, I appreciate Marly Samuel for her willingness to help at all times and availability even during weekends. I would too like to thank Dr. Naska Goagoses for the psychological touch added to this research. Many thanks go to my family and friends, their motivations, encouragements and support will always be remembered. I would like to acknowledge the support from my mother Anna and my sister Anna-Maria, for always being my cheerleaders. Last by not least, this study will not be possible if it was not for the Havana youth who voluntarily participated in this research, for we have worked together to help reach the objectives for this research.

CHAPTER ONE

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The Namibian Government envisions a knowledge based economy and technology driven nation by 2030 (Office of the Prime Minister [OPM], 2014). This is because technology presents a new and faster access to services such as healthcare, online learning opportunities, access to information provided by the government as well as online job services (Abbasi & Manawar, 2011; OPM, 2014). Namibia only has an estimated population of 2.1 million people (Namibia Statistics Agency [NSA], 2011). Yet a major challenge for the country has been an increasing number of unemployed youth, which is currently at 43.4 % (NSA, 2016). Most of the unemployed youth resides in informal settlements where there is less access to basic services (Mwanyekange, 2014).

Numerous digital services are being developed to solve acute socio-economic problems especially in the developing countries. Heeks (2009) indicated that there is a need to develop Information and Communication Technologies for Development (ICT4D) as, in the 21st century, all important aspects in the world will be digital. Hence, the lack of ICT will cause the underprivileged to be further marginalised and to be left out by fast growing opportunities facilitated by ICT (Hourcade, Bullock-Rest, & Schelhowe, 2010). However, most of the technologies fail to be deployed, as the ICT4D approach has been top-down (Heeks, 2009).

Prior literatures on the youth and the use of technology mainly focused on understanding what the youth requires from technology (Carroll, Howard, Vetere, Peck, & Murphy, 2002) and how fast they adopt new technologies (Madden, Lenhart, Duggan, Cortesi, & Gasser, 2013; Weinberg, 2004) as well as the challenges that come with having access to technologies (Abbasi & Manawar, 2011). Aldhaban (2012), outlined that a clear understanding of the factors that lead users to adopt some technologies and not others needs to be established. He further went on to discuss that understanding these factors helps forecast the attitudes of the users towards a certain technology.

Thus in an attempt to provide digital services to unemployed youth in Namibia, and informal settlements more specifically, we do need to understand the factors that will ensure the adoption of provided technologies.

1.2 Research context

This study is part of a long-term collaboration formed in 2014 between the Faculty of Computing & Informatics (FCI) at the Namibia University of Science and Technology (NUST) and the youth settled in 'Havana'. Havana is an informal settlement at the edge of the capital city of Namibia, Windhoek (Shack Dwellers Federation of Namibia, 2009). Havana is considered as one of the largest and highest populated informal settlements, which over the years became home to many young people especially those that migrated from rural areas to the city in search of new job opportunities (Mwanyekange, 2014). The Havana community is faced with different challenges such as lack of infrastructures and access to information (Samuel, Taylor, Winschiers-Theophilus, & Nieminen, 2017).

A preliminary investigation in Havana has shown that the unemployed youth are unware of existing digital services and do not make use of them. A number of technology co-design and co-development activities took place to establish relevant services for the Havana youth, such as job matching, crowdfunding, and counselling among others (Ongwere, 2015; Winschiers-Theophilus et al. 2015). One of these technological solutions is "NamStarter", a crowdfunding platform developed specifically for the youth (Lungameni 2016; RLabs Namibia, 2017). NamStarter is a technology running on a website platform providing a crowdfunding digital service. The system was developed upon a suggestion by the youth to have an online service where they can request funds to support their project ventures (Ongwere, 2015). Over the years, the Havana youth have received support in promotion of entrepreneurial spirit amongst their community and the youth have expressed desires of becoming entrepreneurs to be self-sustainable (Winschiers-Theophilus et al., 2017).

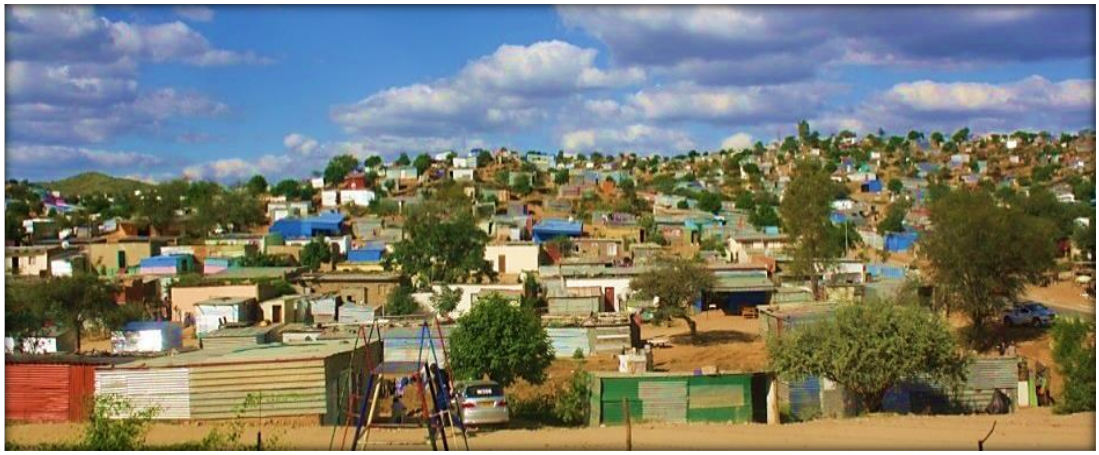


Figure 1: Havana Informal settlement

The participants for this research are all residing in the Havana informal settlement in Windhoek. The first group of participants were recruited through the FCI allies in Havana. All further participants were recruited through different means that will be explained in in the research design. There was always an intermediary from Havana whose role was to contact the youth and to check the venues availability.

The workshops, meetings and all means of data collection took place in Havana at the Kabila centre. The centre is centrally located in Havana and most youth had access to it. The centre is being operated by the Evangelical Lutheran Church of Namibia (ELCIN) within the city programme advocating for communities empowerment (Winschiers-Theophilus, et al., 2017).

1.3 Research problem and aims

1.3.1 Problem statement

Numeral technological services have been developed with good intention aiming at solving acute socio-economic challenges in emerging markets. Yet more failure than success stories dominate the literature, which Heeks (2009) attributes to the shortcomings of the first phase of Information Communication Technology for Development (ICT4D), largely working in a top-down manner with huge power structures in place. Since the focus of technology development projects has shifted to inclusive methods and solid implementation models. Acknowledging contextual differences, researchers have explored how marginalised people in the informal settlements use digital services and have suggested Action Research as a viable method to develop and deploy technologies (Steyn, Rampa, & Marain, 2013). In a quest to

understand how the inhabitants of urban slums in Nairobi, Kenya uses social media, Wyche (2015) discovered that, factors unique to slums such as poverty, employment, gender, and language proficiency affects the impeccable adoption of ICTs.

Youth unemployment has become a serious socio-economic issue in Namibia. As a result, numeral initiatives have been started to fight this trend in order to empower the current marginalised and unemployed youth to sustain a livelihood. Some of the initiatives are skills training, services and technology developments that were co-designed with the youth, such as a job-matching system, a crowdfunding platform and many others to alleviate further marginalisation and exclusion of opportunities. Yet a preliminary investigation into Havana, an informal settlement in Windhoek, shows that the youths are unaware of the services and do not make use of them. A prior contextual mapping has also shown that the youths living in Havana have little access to technology besides cell phones, due to the lack of infrastructure such as electricity and places where they can access the technology. This partly explains why the adoption and integration of these services and technologies has not been successful. However, in the absence of an appropriate technology adoption model further attempts to deploy technologies might continue to be futile.

1.3.2 Research Objectives

The purpose of this research was to develop, an appropriate adoption model of digital services for the unemployed youth in an informal settlement. The proposed model focused on digital services developed specifically for the youth living in the informal settlements of Havana, Windhoek. The deployment of a Crowdfunding system "NamStarter", which was designed at the Namibia University of Science & Technology in collaboration with the Havana youth, was used as a case study to develop a suitable adoption model.

Thus sub-objectives were:

1. To establish current digital services adoption by the unemployed youth living in Havana
2. To co-design a working technology adoption strategy with and for the unemployed youth living in Havana
3. To validate the strategy alongside the deployment of a technology

1.4 Benefits of the study

This research benefits directly the unemployed youth living in Havana and in such a way that they will access services that are specifically developed for them. It will also benefit all those that aim at deploying digital services to youth in informal settlements. This study will further add to the literature of technology adoption.

1.5 Thesis structure

This thesis is organised differently, diverting from a mainstream structure entailing: introduction and background, literature review, methodology, findings and conclusion. “Action research is a dynamic, circular, and evolving research process. It does not fit easily into a format or writing” (Davis, 2004). Thus, the thesis will report in chronological order the cycles of the action research methodology including methods used, results and reflections. Each cycle is the basis for inquiry for the next cycle. Thus, the actual structure used is: introduction and background, literature review, methodology, action research cycles, discussion and proposed adoption model then conclusion.

1.6 Key Concepts and Definitions

a. Unemployed

Different variables come to play when defining the term unemployment, but many countries have adopted the ILO (2016) definition “Being without work, available for work and seeking work”. However, because this study was conducted in Namibia, it followed the Namibia Statistics Agency [NSA], (2015) definition “all persons of working age who were: a) without work during the reference period, i.e. Was not in paid employment or self-employment; and b) currently available for work, i.e. were available for paid employment or self-employment during the reference period.".

b. Youth

This study has adopted the definition of the youth by the NSA, (2016) as those individuals aged 15-34.

c. Informal settlement

The informal settlement also referred to as slums, mostly seen in cities is defined based on different variables such as physical, social and legal characteristics (Srinivas, 2016). The United Nations [UN]

(2015), refers to informal settlements as “residential areas where inhabitants have no security of tenure of the land or dwellings they inhabit, the neighbourhoods usually lack, or are cut off from, basic services and city infrastructure and the housing may not comply with current planning and building regulations, and is often situated in geographically and environmentally hazardous areas. In addition, informal settlements can be a form of real estate speculation for all income levels of urban residents”

d. Digital services

Digital services is referred to as the “the delivery of digital information (data or content) and transactional services (e.g. online forms, benefits applications, timecard submissions) across a variety of platforms, devices and delivery mechanisms (e.g. websites, mobile applications, and social media)” (Digital Services Advisory Group, 2012).

e. Technology adoption

Hall & Khan (2003) defined technology adoption as “The choice to acquire and use a new invention or innovation”. Technology adoption can also be referred to as the acceptance of the technology by the users. There are many models theorising technology adoption in details. Those models will be explained in chapter two.

f. Crowdfunding

Crowdfunding is a technique used to collect funds from individuals through the internet (Swart & Milner, 2015). Sterinberg & DeMaria (2012) explain the art of crowdfunding “as the process of asking the general public for donations”

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

This chapter presents literatures related to unemployed youth in general, digital services adoption among the youth, and existing technology adoption models. The latter will be discussed in details with a systematic review approach, considering the models and theories in place, the context they have been used and a review concerning the applicability to the Namibian marginalised youth settings.

2.2 Youth unemployment

The issue of youth unemployment has been widely studied all over the world in an effort to find solutions to this global crisis (ILO, 2016; Sommers, 2010; Tonny, 2013; Tjikune, 2007). Prior research has mainly focused on the determinants and socio economic factors that lead to the increase of unemployment especially in developing economies. Factors such as a growing number of youth in urban areas in search for new opportunities NSA, (2015); Tjikune, (2007); Uddin & Osemengbe, (2013), lack of information, and required skills to enter the labour market and limited jobs for the inexperienced have been reported as the leading contributing factors of youth unemployment (Kanyenze & Lapeyre, 2012; ManpowerGroup, 2012; ILO, 2016).

Different solutions have been proposed and some implemented to counter fight this trend. Oppenheimer et al. (2011) proposed that the education system need to be enforced, more especially the vocational education (Muiya, 2014). With the aim to overcome youth unemployment, different solutions have been proposed and some are currently in place to diminish the factors of youth employment. Which includes; vocational training programmes, Biavaschi, et al., (2012; Kanyenze & Lapeyre, (2012), funding for business start-ups (Peace Child International, 2015) and improving information dissemination among the youth (ManpowerGroup, 2012).

Most countries in Africa such as Kenya, Ethiopia, Egypt and South Africa have adopted the approach of having specific National Action Plans Policies. These policies specifically point out that the youth need to

participate in national policy development, the education system to respond to the labour market, and creating innovative youth support services (ILO, 2012).

Subsequently, Namibia has implemented the same policies; but youth unemployment continues to be on the stand still. However, the country has recently introduced the “Harambee” prosperity plan that aims at not leaving anyone out and it addresses the issue of youth unemployment in the country (OPM, 2016).

Other organisations in Namibia have also undertaken different approaches in solving this predicament. The Reconstructed Living Labs (RLabs) a concept adopted from South Africa, and now in more than 21 countries worldwide is an initiative, where the youth go through different soft skills training with the aim to empower them, at the same time for these youth to empower others in their communities (Parker, Wills, & Wills, 2012).

Responding to the issue of skills mismatch in the labour market, the Faculty of Computing and Informatics at NUST has initiated an approach where the youth with low skills sets will be uploading their skills on the job-matching site and actually get in contact with the potential employers (Winschiers-Theophilus et al., 2015). The job matching system will make information readily available to the youth at the same time, helping the youth build their credibility as their previous employers rate them. Services of such nature are not only unique to Namibia. In Egypt, Microsoft launched a site that comprises of different modules: career guidance, employability, entrepreneurship and the function of job matching (ManpowerGroup, 2012).

Other services designed for the youth include crowdfunding services. The concept can be explained as an online means where a group of people gathers to give funds in order to support a start-up or a launch of a new service or product (Swart & Milner, 2015).

Considering that, all the above services have been developed specifically for the youth and yet there is no literature that has touch base on the adoption methods/strategy that can be used, this coherently gives room for this research to add value and to these technologies by proposing a suitable adoption model for the youth.

2.3 Youth living in the informal settlements and their access to services

A careful examination of the literature indicates that the youth migrate to the urban areas in search of new job opportunities (ILO, 2012; Oppenheimer, et al., 2011; Sommers, 2010; Indongo, Angombe, & Nickanor, 2013). Migration to cities has been observed and proven to have negative consequences as more people especially young people end up living in the informal settlements (Indongo, Angombe, & Nickanor, 2013). The UN, (2015) outlined that: poverty, unhygienic conditions and diseases seem to spread much faster among people living in the informal settlements. It has been clear that those that live in informal areas are marginalised and they are mostly left out from economic benefits that are available in the urban areas (UN, 2015). Another evident disadvantage of living in the informal settlement is inaccessibility to information and services. Inaccessibility to technology is believed to hamper the access to important information, and thus potentially the access to the formal economic sector (Graham, 2002; Bjoern, Elena, & Ralf, 2012).

Most people living in the informal settlements have little technology access compared to those living in the suburbs or in town houses. This is solely because of the lack of the infrastructure in their areas (Graham, 2002; Keskinen, 2016; Hourcade, Bullock-Rest, & Schelhowe, 2010). However, there is a substantial increase in those that are using cell phones to access services; for instance, in Kenya, Nigeria and Mozambique people are using their mobiles phones to report crimes to a server that is accessible to everybody in their community (Aker & Mbiti, 2010). In South Africa, RLabs has created a digital currency where the youth can earn this currency if they do well in their communities (Burn, 2014). Another benefit “hard to notice” that has increasingly gain popularity is the use of mobile payment solutions especially in the developing world (Donner & Tellez, 2008).

Access to mobile phones, especially to the young generation is regarded as an essential necessity of their daily lives (Porter, et al., 2012). Donner (2008) summmarized how scholars have given an insight on how the people in “underservered” developing world can benefit from the usage of mobile phones. His findings showed that mobile phone presents hope to people living resource constrained settings. However, factors such as cultural, economic and regulatories are hard to notice as they affects the usage of mobile phones in the developing world (Donner, 2008).

2.4 Social entrepreneurship and crowdfunding

Unlike entrepreneurship, social entrepreneurship allows individuals to solve social problems at the same time creating positive impact in the community (Bornstein & Davis, 2010; Bergamini, Navarro, & Hilliard, 2017). However, both forms entrepreneurships require capital to realise the start-up. Since social entrepreneurs' ideas do not necessarily have a high profit turnover, financiers may be reluctant to invest due to low market returns (Reiser & Dean, 2015). In recent years social entrepreneurs started to look at other means of financing options in order to fund their projects. Apart from donors that might come on board, one of the promising initiatives that widely become popular is sourcing funds through crowdfunding. Crowdfunding is a technique used to collect funds from individuals through the internet (Swart & Milner, 2015).

The concept of crowdfunding has widely gained popularity especially in North America and in Europe (The World Bank Group, 2015). Some of the successful and widely recognised crowdfunding platforms such as Kickstarter, Indiegogo have reportedly managed to raise millions of dollars to support social projects and start-ups (Wheat, YiweiWang, & E.Byrnes, 2013). Conversely, Bergamini, Navarro, & Hilliard (2017), reported that crowdfunding is still not exactly known to many social entrepreneurs. In Africa, the concept of crowdfunding has slowly gained momentum with South Africa in the lead running at least 21 crowdfunding platforms (Boum, 2015). Boum (2015) further explained that Africa is still on the verge of adopting crowdfunding compared to Europe and the United States of America. This could partially be due to the complicated processes imposed by the banking system, in terms of receiving foreign currencies, usage of PayPal and other international services. In addition, the usage of electronic payments within the country is only slowly establishing itself.

In Namibia, young entrepreneurs have the privilege to apply for funds from the government through the Namibia Youth Credit Scheme (Ministry of Youth, 2017). However, in most cases not everybody benefit from such funds. Hence, the lack of funds especially for the underprivileged living in informal settlements requires an immediate intervention such as sourcing funds through other means such as crowdfunding.

2.5 Technology adoption models

Professionals across boarders have studied and analysed adoption models and acceptance of digital services (Venkatesh, Morris, Davis, & Davis, 2003; Lai, 2017). Different adoption models have been applied to settings relating to youths and technology usage. Aldhaban (2012) outlined that a clear understanding of the factors that lead users to adopt some technologies and not others need to be established. He further went on to discuss that, understanding these factors helps forecast the attitudes of the users towards a certain technology.

The challenges of adopting and using ICTs can hinder access to relevant information enabling the marginalised communities back in the economic mainstream (Bjoern, Elena, & Ralf, 2012). Therefore, to measure the success of a technology or a service, one evaluates if the users have adopted or have accepted it as expected. Over the years, a number of technology adoption models have been developed and applied across different settings. In the section below, we present the most popular technology adoption models.

2.5.1 Technology Acceptance Model (TAM)

One of the most widely referenced models is the Technology Acceptance Model (TAM). TAM was first proposed by Davis (1986) as a model to test acceptance of information systems or technologies. Davis (1986) theorizes that users adopt technologies based on the "perceived usefulness" and "perceived ease of use" as explained below:

> *"Perceived usefulness: the degree to which an individual believes that using a particular system would enhance his or her job performance*
> *Perceived ease of use: The degree to which an individual believes that using a particular system would be free of physical and mental effort"* (Davis , 1986, P.26).

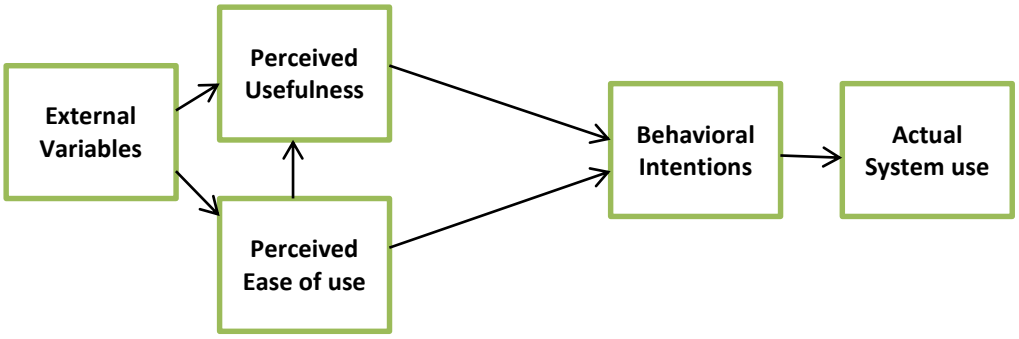


Figure 2: Technology adoption model (Davis, 1986)

The Technology Acceptance Model has been manly used in testing of systems in organisations (Averweg, 2008). However, it was also used to prove that young entrepreneurs in the rural areas in Malaysia demonstrated a high behavioural intention to adopt technology if TAM is used. They further revealed that the young entrepreneurs' intention to adopt ICT is moulded by believes of how the usage of ICT will advance their enterprises, e.g. their "perceived usefulness" but not those technologies that are necessarily easy to use (Zaremohzzabiehet al., 2015).

TAM has been criticised for not considering social aspects (Bjoern, Elena, & Ralf, 2012). Thowfeek & Jaafar (2010) claim that, TAM factors alone do not determine adoption, therefore if technology is to be adopted in a multi-cultural setting, the cultural backgrounds of the subjects need to be considered.

Over the years, the Technology Adoption Model has been modified to embrace some of the external variables, which were excluded from the initial model (Viswanath Venkatesh, 1996). They further determined that self-efficacy plays an important role in adopting a new technology. Furthermore, Lai (2017); Venkatesh et al., (2003) conducted a comprehensive review of how the TAM has evolved over the years.

2.5.2 Motivation Model (MM)

The model suggests that usefulness and enjoyment plays a huge role in one's intention to use a technology (Davis, Bagozzi, & Warshaw, 1992). The model puts emphasis on the users internal and external motivation referred to as (extrinsic and intrinsic motivation). The extrinsic motivation is the keenness of one's intention to execute an activity because of known to have a positive impact or because it is "perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such has improved job performance, pay, or promotions". Another main factor is the

intrinsic motivation, which is associated with the perception of pleasure as well as satisfaction in performing the action (Davis, F. D., Bagozzi, R. P., & Warshaw 1992). The model was mostly used in testing users reasoning using a computer especially in a work place.

2.5.3 Theory of Reasoned Action (TRA)

Fishbein & Ajzen, (1975) postulate with the Theory of Reasoned Action (TRA) that individuals make decisions based on beliefs, attitudes, norms, intentions and behaviour as shown in figure 4 below. TRA envisages that those performing behaviour are normally influenced by their free will (Attitude), and how others perceive the intention (Subjective norm). Fishbein & Ajzen, (1975) further distinctively indicated that the attitude and the subjective norm have a superior impact towards ones intention to perform the action / behaviour. The TRA is used mostly in psychology, but it was never applied directly to research for youth unemployment or to those living in the informal settlements.

The theory of reasoned action has been used to successfully aid in predicting the actual consumer's behaviours intention, because of that, it was criticised due to that not in all settings the subjects have whole control of their behaviours (Olushola & Abiola, 2017). The theory does not consider other factors that have a direct impact towards ones behaviour such as social roles, characteristics and demographics (Olushola & Abiola, 2017). Furthermore, Trafimow (2009) criticise the theory, saying that it cannot be falsified, unless if rational standards are applied.

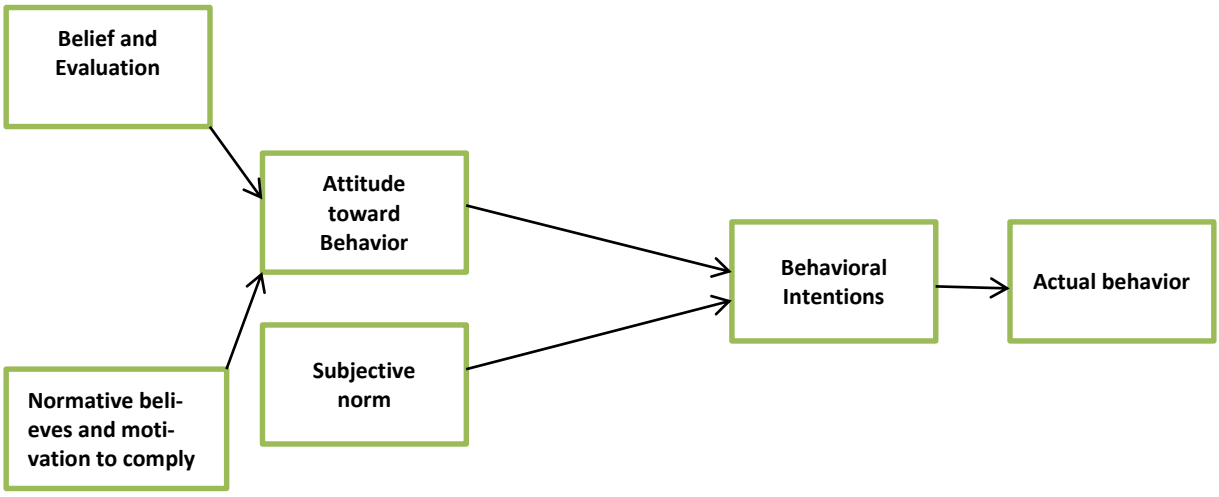


Figure 3: Theory of Reasoned Action Adapted from (Fishbein and Ajzen, 1975)

2.5.4 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour was developed as an extension to the Theory of Reasoned Action (Ajzen, 1991). The Theory of planned behaviour was developed to address the critics of TRA (Sharma & Mishra, 2014) TPB predicts an individual's behaviour in an obligatory way unlike in TRA where the behaviour is forecasted according to an individual's free will. TBT is similar to TRA but with an extension of "perceived behaviour control" which predicts if, it is easy or hard to perform certain behaviour (Ajzen, 1991). The foundation of TPB was equally rooted in the self-efficacy theory of Sharma & Mishra (as cited in Bandura, 1977).

Scialdone & Zhang (2010) criticise both the TPB and TRA for omitting the "human psychological and biological needs" as well as for not considering the essentials volitional behaviour. Olushola & Abiola (2017) further pointed out the weakness of the theory in terms of "Constructs are difficult to define and measure in the study. The model suffers from multi co-linearity among the independent variables".

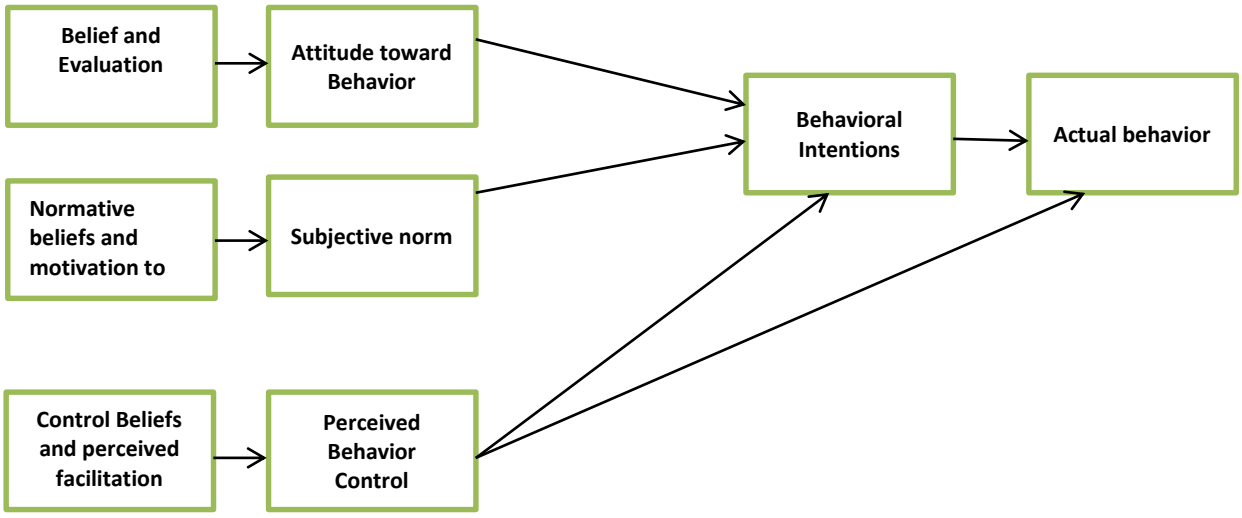


Figure 4: Theory of Planned Behaviour Adapted from (Ajzen, 1991)

2.5.5 Innovation Diffusion Theory

Rogers's diffusion theory demonstrated that four elements matters to diffuse an innovation: Innovation, Communication channels, time, and social systems (Rogers, 2003). The progression of diffusing an innovation consists of five stages, namely knowledge, persuasion, decision, implementation, and

confirmation. Rogers further distinguishes different sets of adopters as not all users adopt a technology at the same time: innovators, early adopters, early majority, late majority, laggards and the leap floggers (Rogers, 2003).

The diffusion of innovation has been used to explain the adoption of communal computing facilities in the disadvantaged urban communities in Cape Town South Africa (Chigon & Licker, 2008). They have observed that most community members use the facilities to look for jobs. However, those that are computer illiterate do not use the innovation because no training was provided on how to use it. The setting in which the theory is applied to is similar to that of this study. Therefore, the diffusion of innovation factors will be considered more thoroughly.

The shortcomings of the theory are well captured by scholars across borders. According to Waterman (2004), the theory does not foresee the possibility of users rejecting the innovation even if they are fully aware of how it works and the advantages. Kole (as cited in Botha & Atkins, 2005) criticise the theory as it does not take into account other factors that can lead to failure such as that the technology was probably a bad idea, and it also only focus on individual adopters without putting into consideration the social structure.

2.5.6 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) combine numerous models/theories, namely; Theory of Reasoned Action, Technology Acceptance Model, the Motivation Model, Innovation Diffusion, Theory of Planned Behaviour etc. UTAUT adopts the following constructs: performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh, Morris, Davis, & Davis, 2003). The use of variables (gender, age, experience and voluntariness) helps to moderate the relationships in the model (Venkatesh et al., 2003).

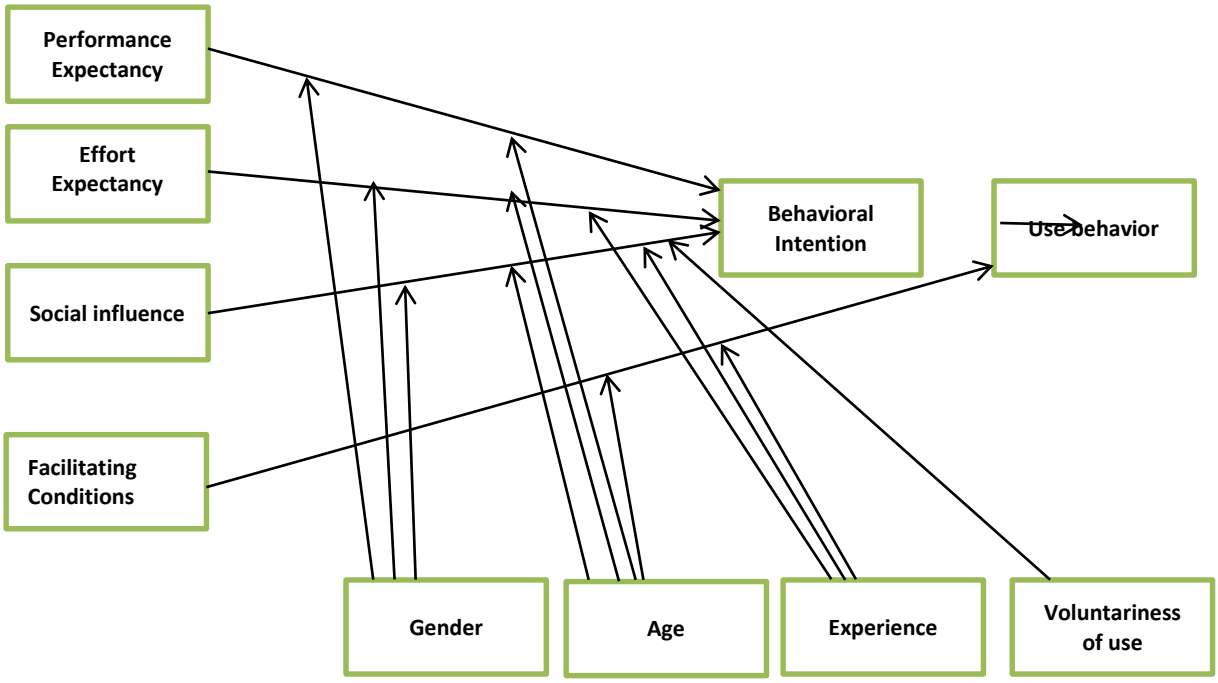


Figure 5: UTAUT, Adapted from (Venkatesh, Morris, Davis, & Davis, 2003)

The theory has been praised due to the inclusion of factors and determinants expressed in other theories and it is the only model "able to account for 70% of the adjustment in usage intention – a considerable improvement over any of the original eight models and their extensions" (Venkateshet al., 2003). However, it has also been criticised because it is complex to use and it cannot really explain individual's behaviours (Sharma & Mishra, 2014).

2.5.7 Mobile Phones Technology Adoption Model (MOPTAM)

Biljon & Kotzé (2007) proposed a new model by analysing the Technology Adoption Model, Unified Theory of Acceptance and Use of Technology and Rogers' diffusion Model to propose a new model MOPTAM for mobile phones adoption in Southern Africa. The MOPTAM is concerned with matching the needs and expectations of users, with those of new mobile phone designs, in the end helping those designing to know what exactly the mobile phone user's needs. Their model has looked at the determining factors such as social influences (which has to do with peer opinions), Facilitating conditions (which encompasses of the actual system design and services, the costs) that influence mobile phone adoption such as demographic, social-economic factors and social factors. Other factors derived from TAM include perceived ease of use, attitude, and behavioural intention.

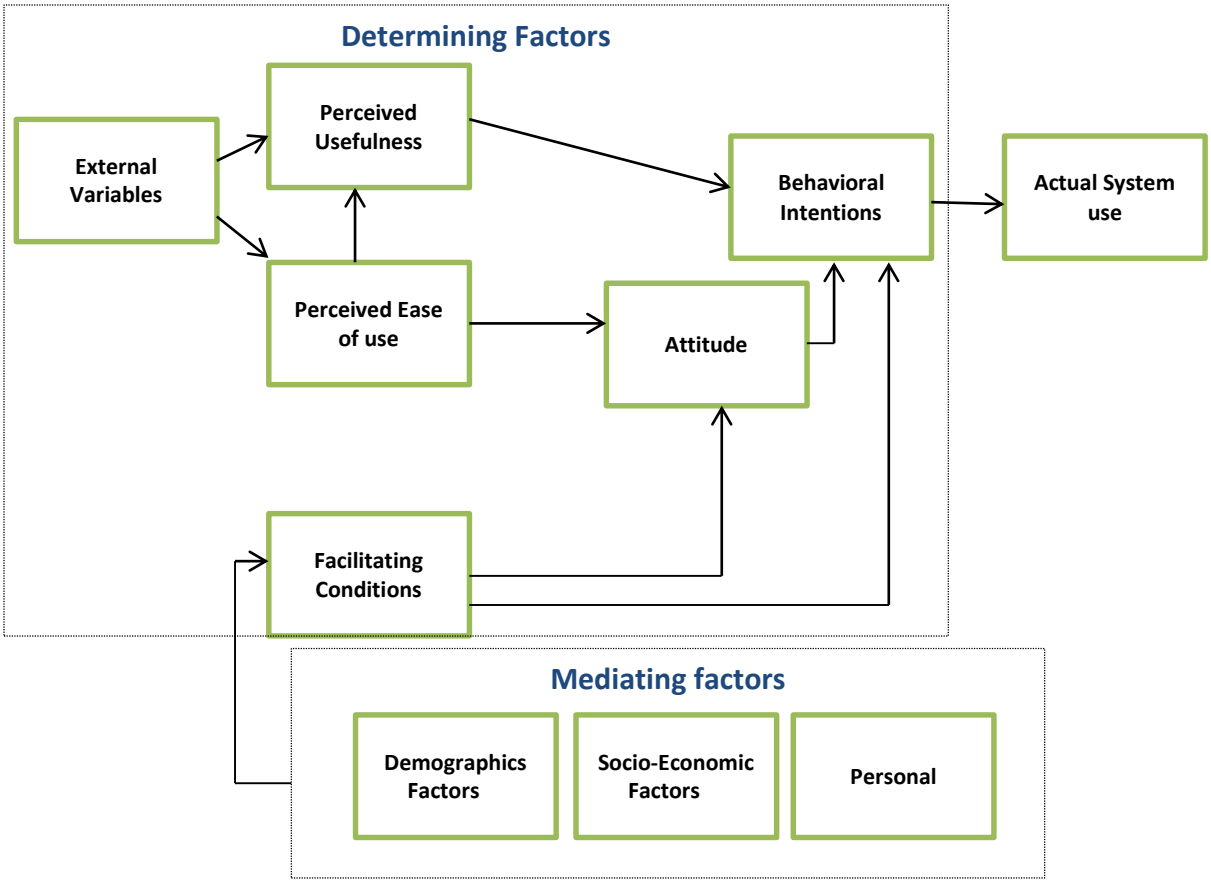


Figure 6: MOPTAM adapted from Biljon & Kotzé (2007)

While MOPTAM has been referenced widely in the literature, little evaluations have been done. The need for reviewing the model was triggered by its mediating factors such as demographics and the socio economic factors that could possibly fit the context of this study. Contrariwise, since the model is specifically developed for adopting mobile phones only and not any other technological system, we are of the opinion that not all factors might apply. However, we postulate that it is still worth it to verify it is applicable for this study.

2.5.8 Atheoretical related studies

Several scholars studied how youth or marginalised community members use information and communication technologies for developmental purposes in different countries. However, most of the studies are atheoretical "not based on or concerned with theory" (In Merriam-Webster's dictionary, 2017). This section will highlight those studies; looking at the factors and how their approaches led to adoption and their suggestions or critics if any.

Woelfer & Hendry, (2010) narrated how homeless young people aged 13-25 use information systems at the community technology centre in the United States. Some of the main activities include “using digital tools to find employment, telling stories with representations of the built world, portraying life on the street with video, and constructing online identities”. The centre rewards those that have completed the class with gifts to help with spreading the news and create awareness of the centre. Clearly, the reward system is not linked to a known adoption model but it can be perceived as a diffusion mechanism that influence others young ones to join the programmed and get rewards (Abbasi & Manawar, 2011).

Lorini, Van Zyl, & Chigona (2014) discovered that the youth of Khayelitsha and Philipi informal settlements, South Africa, exploits ICTs for social interactions, creativity and for searching for sport related information. Since not all the young have the ICT knowledge, they mostly depend on a trained group member “informediary” with more skills to perform complex tasks. Lorini, Van Zyl, & Chigona (2014) further state that parameters such as age cost of technology, education level influence the adoption of technology among community members. Similar conclusions were drawn by (Sambasivan, Cutrell, Toyama, & Nardi, 2010) who promote intermediaries to bridge the computer literacy gap within the community.

The findings in South Africa are comparable to observations in India (Sambasivan et al., 2009), where literate community members are the main driving force in bringing technology closer to those that are non-technology users. It has been shown that young people are more likely to adopt a technology if there is an entertaining aspect in it (Rangaswamy & Cutrell, 2012). Social factors play a significant role thus youth being influenced by friends and families and some opt to adopt a technology for a status (Sambasivan et al., 2009).

Keskinen (2016) noticed that the youth in Havana informal settlement have an interest in entrepreneurship; however, the lack of infrastructure and previous successes prevents them from venturing into business. After introducing the youth to various technologies, he discovered that usability plays a significant role. Youth complained that that the mobile applications with challenging vocabulary made it difficult to operate.

Numerous technology adoption models have been derived based of different theories and previous models. It has been recognised that besides the users’ attitude and subjective norm other factors might

play a role in the successful adoption of technologies, such as the context. Considering that we are concerned with the adoption of technologies and digital services of marginalised youth living in informal settlements, we need to investigate the relevant factors and derive a localised technology adoption model ensuring the wide spread of digital services among the youth.

CHAPTER THREE

3. METHODOLOGY

3.1 Overview

This chapter will first give a brief overview of the overall methodological approach used for this study, then an in-depth portrayal of the research design. This research used primary data as well as secondary data. Both theoretical and empirical data collected was analysed.

The research is situated in a pragmatic research paradigm. Hence, the research did not follow a single specific method, but employed the pragmatism paradigm that interrogated the phenomena with the most fitting method.

3.2 Methodological approach

Action Research (AR) was used as the overall research methodology to develop the digital service adoption strategy for youth living in the informal settlement of Namibia. The AR intents to first understand the problem and then develop a localised solution (Hayes, 2011). According to Ozanne & Saatcioglu (2008), AR aims to provide a workable solution to improve the lives of a group of people, mostly community members. AR directly involves the marginalised and vulnerable groups in all stages of research to generate the knowledge and with the aim to transform and solve problems they are faced with (Popplewell & Hayman, 2012). The process of conducting action research is usually presented in cyclical figures, as diagrammatised in figure 7 below. In this instance, there are many phases involved from the point of diagnosing the problem, planning for the solution, performing the actual action and finally evaluating and reflecting on the lesson learned.

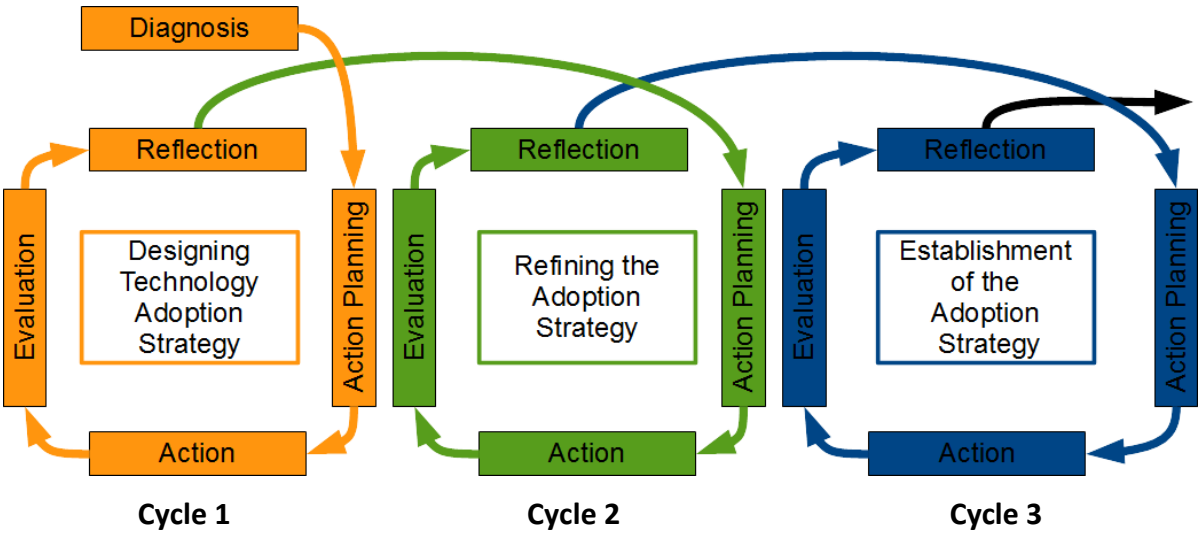


Figure 7: Action Research cycles

The researcher was in a good position to work directly with the youth of Havana from the point of establishing the current technology adoption methods used in Havana until the stage of proposing a digital service adoption model to be used in Havana. Hayes, (2011) stated that an AR approach gives the scientific rigorous component to the research while researchers and community interested parties are solving problems especially for the marginalised communities to develop localised solutions. Even though AR is praised within the research community, it has faced critics too; it is believed to create false hope in the communities as they might expect change, which is always not guaranteed (Steyn, Rampa, & Marain, 2013). Therefore, it is very important to prepare these involved for a closure and discuss the way forward after the completion of the research (Hayes, 2011).

3.3 Research Design

To get a clear understanding of the AR Circles mentioned above, the phases are explained in the table below. Each phase will be referenced to with an abbreviation. Hence, C1:D1, C2:AP2 (Cycle 1: Diagnosis 1, Cycle 2: Action Planning 2). Therefore, reference will be made to the phase using the abbreviated annotation.

Cycle	Phase	Question/objective	Method	Finding/results
Cycle 1 **Design Technology Adoption strategy**	Diagnosis 1 (D1)	Which are the current technologies known to the Havana Youth? How are the youth currently adopting those technologies?	1. Questionnaire 2. Focus groups 3. Digital services expo workshop	Few technologies known, Yet no adoption, extracted factors affecting adoption in Havana
	Action Planning 1 (P1)	How is the rest of the world in similar setting as Havana adopting technologies?	1. Systematic literature review	Extracted factors affecting adoption Created strategy Created adoption time schedule
	Action 1 (A1)	How should new technologies be introduced in Havana to ensure better adoption?	1. Introduction to the adoption strategy workshop session 2. Training on the technology usage 3. Joint design of adoption campaign;	The campaign materials for deployment were not clear, youth were not committed
	Evaluation 1 (E1)	What were the action taken and their outcomes?	1. Synthesise results from AP1 and A1	Technology not adopted as the youth seems not to understand their roles and responsibilities, nor the system.
	Reflection 1 (R1)	What are the lesson learned to be considered in AP2	1. Reflect upon the action and its outcome. 2. Summarise the lesson learned	Lesson learned to be carried over to AP2
Cycle 2 **Refine Technology Adoption strategy**	Action Planning 2 (AP2)	What are the elements that contribute to the ambassadors' understanding of their role in the technology adoption campaign?	1. Dedicated commitment session, 2. Campaign material refinement 3. Content training	Commitment session Campaigns materials redesign workshop, training plan
	Action 2 (A2)	How should the ambassadors understand their role in the technology adoption campaign to lead to better adoption of the technology?	1. Dedicated commitment session 2. Campaign materials refinement workshop 3. Content training	Youth set adoption/ deployment goals, better understanding of the system, partial execution of the adoption plan
	Evaluation 2 (E2)	What do the youth think of the whole adoption process?	1. Questionnaires	Youth not motivated
	Reflection 2 (R2)	What are the lesson learned to be considered in AP3	1. Summarise the lesson learned	Lesson learned to be carried over to AP3

Cycle 3 **Establishment of the Technology Adoption strategy**	Action Planning 3 (AP3)	what are the elements that will improve the technology adoption strategy	1. Scrutinize results from E2	Developed a refined adoption strategy, Developed a deployment schedule
	Action 3 (A3)	What are the best methods to implement the proposed adoption strategy in AP3?	1. Workshops 2. Meetings 3. Training	System deployed, motivated youth
	Evaluation 3 (E3)	How effective was the adoption strategy?	1. Questionnaires 2. Discussion among researchers	Committed ambassadors, Successful deployment
	Reflection 3 (R3)	What are the lesson learned to be considered in the development of a technology adoption model	1. Summarise the lesson learned	Social influence and capability plays a role in adoption

Table 1: Phases of action research explained

3.4 Participants' engagement

3.4.1 Participants' recruitment

In gathering youth from Havana, we collaborated with a community intermediary. Upon announcement of visits to Havana, he would assure that sufficient participants are gathering and that the venue is booked. He sent messages to the youth to remind them of an upcoming workshop. In many cases, a core set of participants would attend with a number of newcomers. However, as per the research design for this study a set of selected youth became the community intermediaries, whereby the researcher then interacted directly with the selected youth group.

3.4.2 Forms of Engagements

The engagements with the youth were in form of workshops. Workshops would consist of different activities such as training, evaluation, and design sessions. We promote a participatory design (PD) approach. Participatory design is a method used whereby the participating stakeholders are involved from the beginning until the completion (Muller & Kuhn, 1993). We used the PD method, as we wanted to have the youth engaged in all activities instead of us proposing a solution readymade.

3.4.3 Ethical considerations

An ethical clearance certificate was obtained through the Faculty Ethics committee of the Namibia University of Science and Technology. An informed consent form (see appendix 9) was distributed for

signature by all participants before each contact session. All participants were informed about the research agenda, the activities involved, and the right to leave anytime without consequences, the assurance of anonymity concerning research data. To be noted is that the final users of the system are not anonymous, as they have uploaded their details and projects on the public website. All participants were firstly asked for recording permission and later for permission to use the recordings for publications, such as the photos included in this thesis.

CHAPTER FOUR

4. ACTION RESEARCH CYCLES

4.1 Chapter overview

This chapter presents the three AR cycles in chronological order for the reader to follow the train of thought. Hence, the results of each cycle determine the actions planned in the next cycle.

4.2 Cycle 1: Designing the adoption strategy

4.2.1 Cycle 1, Diagnosis 1

The diagnosis stage aimed at addressing the first sub-objective of this research namely to establish current digital services adoption by the unemployed youth living in Havana. We used three distinct methods of collecting data for this stage: questionnaires, focus groups and a workshop.

4.2.1.1 Questionnaires

Self-administered open and close-ended questionnaires were distributed at the beginning of a workshop and filled in by 15 youth living in Havana (see the complete questionnaire in appendix 1). The questionnaire for this study were collaborated and combined with other research studies in Havana. We chose to work together for us to introduce the projects to the youth and we expected it was a perfect moment to meet with a larger group of youth at once. Therefore, only few questions are directly related to this research: Question 1-4 addressed demographics. Question 11, 24, 25 and 26 were specifically for this study. The researchers anticipated the questionnaires to take 15 minutes but some of the youth expressed that the wordings used were of too high level and they did not understand, therefore, it ended up taking 45 minutes. The research team had to explain into details and translate some of the questions into local languages. We captured the following for each relevant question.

Participants 'demographics

The response recorded that there were at least 10 females and only 5 males aged between 12-34 of which two were older and did not match the characteristics Namibian youth. That this has been the typical representation for the group joining us in terms of gender and age.

Most youth also reported that they speak Oshiwambo (a local language) as mother tongue and only one (1) of them usually speaks English. However, they all understand English. Most of the respondents have not completed their high school education and those that ended in grade 12 and they did not study further. However, two of them indicated to have other form of qualification apart from the high school certificate.

Mobile phone access

The youth indicated that not all of them have access to a mobile phone and only use a phone sometimes. This means that they probably are not in a position to afford a mobile phone or because of any other unknown reasons.

Youth Services known to the youth

Eleven (11) youth responded to this question and indicated to know of several youth services. They however did not mention the services, but rather the organisations that offer such services. There was a similarity on the results collected during questionnaire and focus group. The results were merged to confirm if the youth have identified more or similar services and the results are explained under the focus group section.

Service use frequency

Fourteen (14) youth responded to this question. The services named are all not technological and not all of the respondents make use of them. The reason behind the non-usage of the services could be that they are not aware of the advantages and benefits the services provide, or perhaps they are not introduced to the services yet.

Service discovery

The youth listed to know about the services through the following different means such as friends, newspapers, school, radio and through social networks.

4.2.1.2 Focus groups

A focus group was held with seven Havana youth to establish and discover the current digital service(s) used in Havana. This enabled the researcher to get the youth's impressions and views as well as deeper insights on the issue. The focus group session plan is depicted in appendix 2.

The first discussion focused on identifying known institutions / companies or organisations that offer services to the unemployed youth or where they can get assistance. Such exploration was done in questionnaire, however, it was repeated in the focus group as we though the youth will be more open and capable of providing more information when discussing with others and writing the required information on the sticky notes than answering in questionnaires.

The second part of the discussion went on to identify the services provided by organizations/companies or institutions identified that is accessible via the cell phones or on the computers. Below is a list of organisations the youth identified. The results in this section are combined with that gathered through questionnaires.

The youth identified eighteen organisations (five were identified in questionnaires, eleven were identified during focus groups and only two identified in both methods). Of the organisations identified, only five offers services the youth can be access using mobile phones or computers (see results in appendix Organisations and services identified.

eWallet services

During the focus group session, we e introduced the eWallet service to the youth. eWallet is an electronic banking service offered by the First National Bank (FNBNamibia, 2016)".

> *"FNB eWallet allows customers to send money to anyone with a valid Namibian cellphone number. The money is transferred instantly and can be used to withdraw cash from FNB ATM's, buy prepaid airtime and send money to another cellphone"* (FNBNamibia, 2016)"

Our aim was to give an example of services well adopted in the country and find out how many youth are using the system and if the youth knows of the success factors attached to such prosperous adoption. Out of 7 youth, five indicated to know of eWallet very well and they have indicated that they use it. Below are reasons the youth thinks why eWallet gained its popularity.

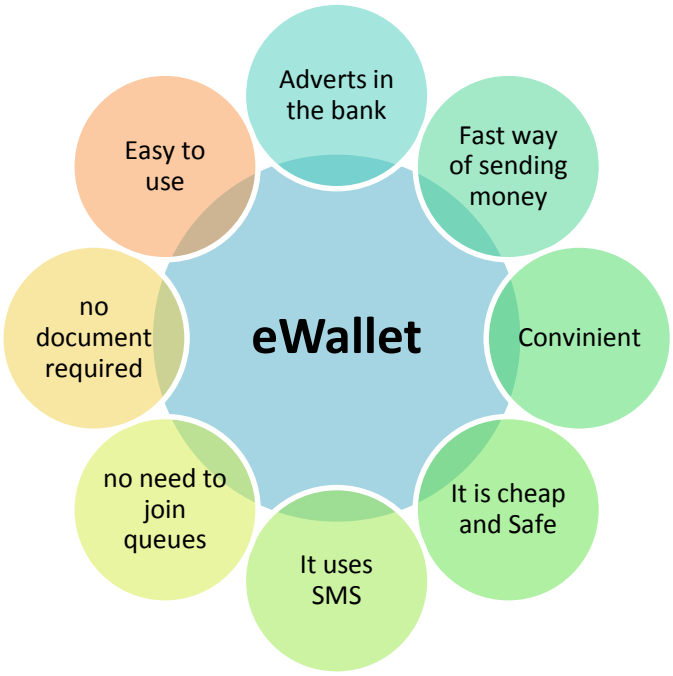


Figure 8: reasons for eWallet service

4.2.1.3 Digital services expo workshop

A workshop was designed to expose the youth to existing digital services and identify which service they would like to make use. At the same time, we wanted to establish the importance of technology adoption factors such as perceived usefulness, ease of use and entertainment for their formulations of intend to use. The four technologies introduced during the expo were; Funzi, a mobile learning browser application (Funzilife Inc, 2017); Fuzu, a career website for job searching (Fuzu ltd, 2016); a Mobile Wallet application for budgeting and keeping track of income and expenses, and a gaming application Angry Birds (Rovio Entertainment Corporation, 2017) . Four stations were set up in such a way that an application per table on two mobile phones could be used per station. Each station was manned with a postgraduate student for assistance. The arrangement was designed in such a way that the youth can visit all station by rotating to familiarise themselves with each technology at their own paste (Keskinen, 2016).

After the visit at the different stations, all youth gathered around in form of a circle to discuss the applications and to vote for the most useful application cnsidering their current challenges

in the community (Keskinen, 2016, p44). The feeback below highlights some of the youth comments and suggestions.

a. Angry birds

An angry bird is a video gaming application (Rovio Entertainment Corporation, 2017). It was observed that more youth spend a lot of time at the gaming station (comparing to other stations). Many of them indicated that it was their first time playing the angry birds. The youth indicated that it was fun and they enjoyed it. Some youth however indicated that they do not like playing games just for fun, but rather games that are beneficial to them, or teaching a life lesson like Monopoly. Some youth have also expressed that because they do not have electricity at their houses, playing games might flatten their phone battery.

b. Funzi

Funzi is designed to assist the youth to write comprehensive CVs by probing them with questions. The app also enables the youth to prepare for job interviews. The website is designed in such a user-friendly manner, there are icons making it more convenient when navigating through the app. The application received more critics as the words used are difficult to understand and not all the youth are highly educated. The youth also complained, that it could have been better if the application was translated into the local indigenous languages for it to attract more youths that do not understand English. Regardless of the critics against the application, the youth were very impressed with the Funzi application in the end voted in favour of this application.

c. Fuzu

Fuzu helps people to search for jobs online. The Havana youth seemed to like fuzu, more than angry birds' game and the mobile wallet but not as much as the Funzi. The participants spend much time filling in the application forms with great dedication and precision. It seems plausible that they do not distinguish a real application from testing the system only. Also difficult was the categorisation of the jobs themselves.

d. Mobile wallet

The application assists with tracking expenditures and earnings. The youth have indicated that the application really offers value, as it will save time and money to go to the bank and one can just perform all transaction on the phone. The youth indicated that for the youth to adopt such technology, training

would be required as it is not easy to use. The youth raised other concerns over the fact that the Havana youth have little earnings and the application might be not relevant to them, rather to the entrepreneurs in the community. The suggestions that come by include localising the application into indigenous such as Oshiwamo, Damara and Otjiherero.

After a careful analysis of the workshop results and that documented by Keskinen, (2016) we discovered few factors that could play a major role in our adoption strategy. The first factor was the perceived usefulness. Hence, the youth liked Funzi, because after operating the application they found out that it is important and it can positively influence their lives unlike the angry birds. Secondly, we discovered that entertainment is not important and it flattens their batteries. Thirdly, we discovered that the perceived ease of use is important as not all applications presented were easy to use and some used high level English. Therefore, the factors captured in this section will be used in the design of the deployment strategy.

4.2.2 Cycle 1, Action planning 1

A systematic literature review approach was used to identify, critically evaluate and integrate what the relevant existing studies discovered (Yannascoli, Schenker, Carey, Ahn, & Baldwin, 2013). In this instance, the systematic literature review helped to analyse the empirical studies done in the areas such as digital services adoption for the unemployed youth's in the informal settlements. This study has adopted the systematic review approach as Siddaway, (2016). The articles extracted through the systematic literature review are integrated in the literature review in chapter two.

This section is organised as follows: firstly, it will demonstrate how the systematic literature review was conducted; secondly, it shows the factors extracted from the systematic literature review combined with the factors discovered during C1, D1. Thirdly, the proposed strategy and then finally the adaptation schedule are presented.

4.2.2.1 Systematic literature review stages

a. Scoping

The research question used: Which technology adoption models are appropriate to be used in the informal settlements by the unemployed youth?

b. Planning

Terms used: technology adoption, informal settlements, unemployed youth, marginalised youth, Africa, Slums, technology acceptance.

Inclusion criteria: all papers

Exclusion criteria: The literature review did not leave out any papers as we have discovered that most adoption models are developed some time back.

c. Identification (Searching)

Digital library used: Association for Computing Machinery (ACM) and Google Scholar, IEEE

d. Screening

To automatically organise, save time and remove duplicates from the search results, all results were automatically exported to Zotero citation manager (Roy Rosenzweig Centre for History and New Media, 2017).

e. Eligibility

All the relevant articles extracted are displayed in the table below

Authors	Title	Model used	Context
(Rangaswamy & Cutrell, 2012)	Anthropology, Development and ICTs: Slums, Youth and the Mobile Internet in Urban India	Atheoretical	Urban slums
(Woelfer & Hendry, 2010)	Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Centre	Atheoretical	Youth, Homelessness, Digital media
(Keskinen, 2016)	Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Centre	Atheoretical	informal settlement
(Abbasi & Manawar, 2011)	Multi-dimensional challenges facing digital youth and their consequences	Atheoretical	Digital youth
(Hourcade, Bullock-Rest, & Schelhowe, 2010)	Digital Technologies and Marginalized Youth	The authors propose adapting existing models but no specific one	Marginalised youth
(Bjoern, Elena, & Ralf, 2012)	Social Aspects in Technology Acceptance: Theory Integration and Development	UTAUT, Model of Adoption of Technology in Households (MATH)	Social influence
(Sambasivan, Cutrell, Toyama, & Nardi, 2010)	Intermediated Technology Use in Developing Communities	Atheoretical	Urban slums
(Biljon & Kotzé, 2007)	Modelling the Factors That Influence Mobile Phone Adoption	Mobile phone adoption model	Adoption model, Africa
(Wyche S. , 2015)	Exploring Mobile Phone and Social Media Use in a Nairobi Slum: A Case for Alternative Approaches to Design in ICTD	Atheoretical	Informal settlement
(Wyche, Forte, & Schoenebeck, 2013)	Hustling Online: Understanding Consolidated Facebook Use in an Informal Settlement in Nairobi	Atheoretical	Youth, informal settlements
(Sambasivan, Rangaswamy, Cutrell, & Nardi, 2009)	Ubicomp4D: Infrastructure and Interaction for International Development—the Case of Urban Indian Slums	Atheoretical	Urban slums
(Scialdone & Zhang, 2010)	Deconstructing Motivations of ICT Adoption and Use: A Theoretical Model and its Application to Social ICT	TRA, TPB, Motivation Model	Youth, social ICT

Table 2: Systematic review results

4.2.2.2 Factors influencing adoption

The following table shows the results of the factors extracted from the existing adoption models pointing at factors relevant to the Havana youth, based on preliminary data.

Model Factor	TAM	MM	TRA	TPB	RID	UTAUT	MOPTAM	Havana youths
Perceived ease of use	Yes			Yes	Yes	Yes	Yes	Yes
Perceived usefulness	Yes		Yes	Yes		Yes	Yes	Yes
Behavioural intentions (enjoyment, goal orientation, and self-efficacy**)**	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Entertainment		Yes						
Social influence (conformity, compliance an obedience)						Yes	Yes	Yes
Facilitating conditions (infrastructure)							Yes	Yes
Attitude	Yes	Yes	Yes	Yes			Yes	
Efficiency/ performance						Yes		
Personal(relative advantage, compatibility, complexity, trialability, observability**)**		Yes	Yes		Yes	Yes	Yes	
Demographic(age, gender, education and technological advancement)	Yes						Yes	

Table 3 : Factors influencing adoption

Based on the table above, five factors where considered in designing the first adoption strategy for the youths living in the Havana informal settlement.

The selection of factors relevant to the Havana youth was based on the literature review and prior work in Havana and confirmed during the diagnosis phase. Ease of use seemed apparent in numerous technology evaluation sessions organised by my fellow researchers. Perceived usefulness was expressed

by the youth participants during the digital service expo. Thus, we derived that behaviour intent or self-efficacy would be a driving factor influencing technology use as promoted by mainstream technology adoption models. We observed that social influence played important role in affecting the youth's participation in previous technology design and training sessions. The infrastructure is considered a necessity to use web-based technologies. Resonating with mainstream technology adoption models, those factors were incorporated in the first proposed adoption strategy for Havana being revised in later stages. The figure below shows the first strategy proposed from the factors as explained.

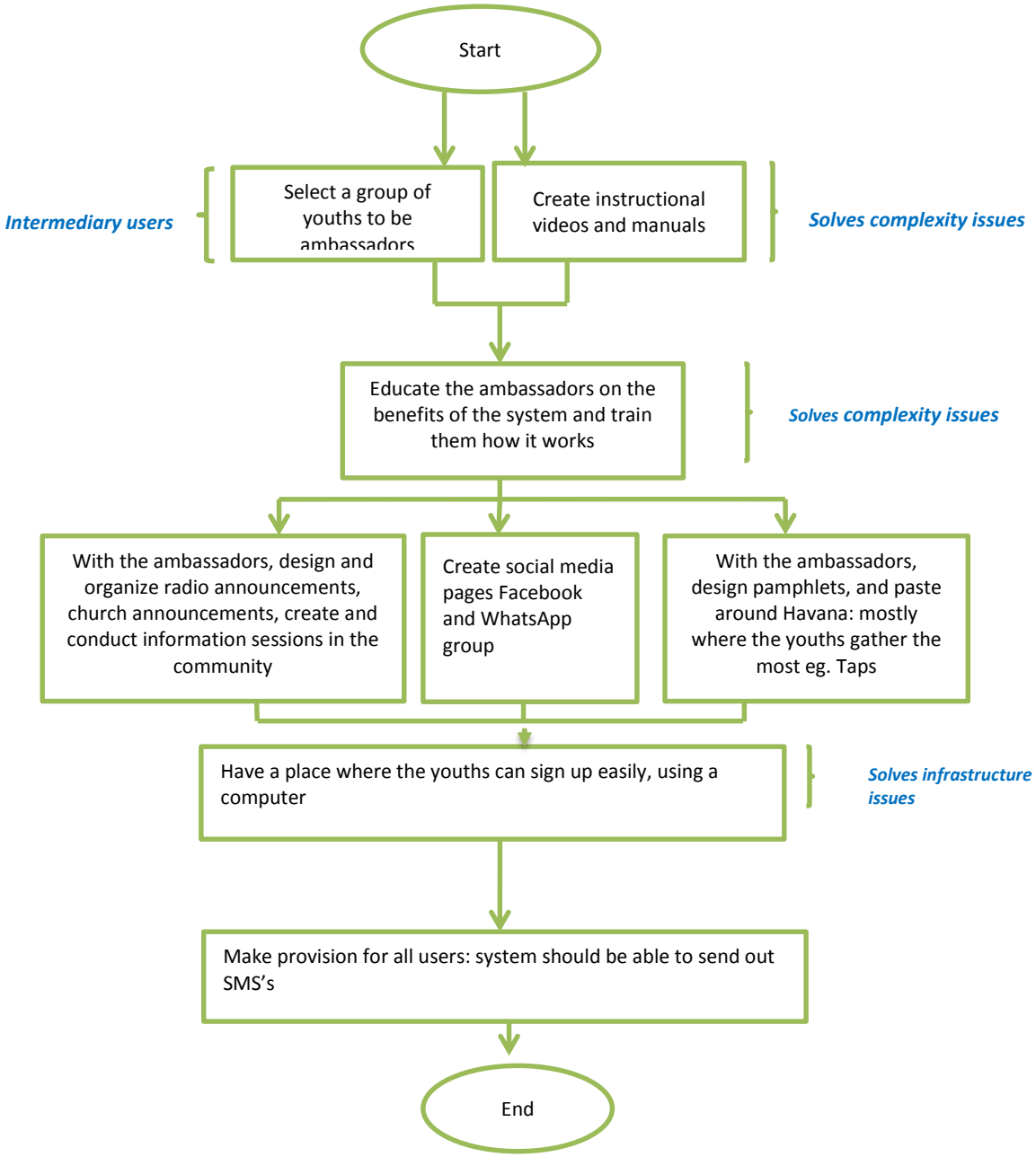


Figure 9: The proposed adoption mode

The relationship between adoption model factors and the proposed adoption strategy are explained in the table below:

Factor	Relationship with strategy	Explanation
Social influence / intermediary user	Selecting a group of youths to be ambassadors	The ambassadors will be the main driving force to influence other community's members to start using a technology.
Perceived usefulness	Create instructional videos Educate the youths on the benefits of the system. With the youths, design and organize radio announcements, church announcements, create and conduct information sessions in the community	The youth have indicated that having a technology that is of high benefit is very important. For instance, the youth have voted in favour of the Funzi application because is very useful
Infrastructure	Have a place where the youths can sign up easily, using a computer	One of the main problems discovered by several researchers and by the youth during C1:D1 was that there is a lack of infrastructure in Havana. It is therefore important to always have a place where the youth will easily access the technology
Ease of use	The system should be user friendly and must be able to accommodate all users types	Most of the youth in Havana are not highly educated, and in C1:D1 they indicated that it was hard to perform actions on complicated applications, therefore, it is very important to them if the system to be deployed is very easy to use

Table 4: Relationship between the factors and the strategy explained

Ambassadors

Technology ambassadors are a set of youth selected from the Havana youth. The concept of ambassadors allows those youth introduced to the technology and is interested in working with the research team to voluntarily sign up and agree to participate in all activities of ensuring that the technology is deployed in their community. The ambassadors will serve as the contacts between the research team, technology being deployed and the community they live in. The ambassadors will be the main custodians and they will need to execute most of the activities in the proposed strategy.

The table below shows the planned tasks to support the deployment of the system.

Planned Task sequence
Select a group of youths to be ambassadors
Educate the youths on the benefits of the system and train them how it works
With the youths, design and organize radio announcements, church announcements, create and conduct information sessions in the community
Create social media pages: Facebook and WhatsApp group
With the youths, design posters, and paste around Havana: mostly where the youths gather the most eg. Taps
Have a place where the youths can sign up easily, using a computer
1Create instructional videos and manuals Share on social media sites
Enable all users to access the system

Table 5: Adoption time schedule

4.2.3 Cycle 1, Action 1

We planned three activities to be executed at this stage: a workshop, training on the system usage and a joint design of adoption campaign.

4.2.3.1 Introduction to the adoption strategy workshop session

The researcher first presented the adoption strategy on a flip chart paper and displayed where all the youth can see it. The youth were requested to suggest any changes or and they only suggested one addition: “Announcements through mega speaker. The researcher gave such an opportunity to the youth to help understand it better and give them a chance to ask questions.

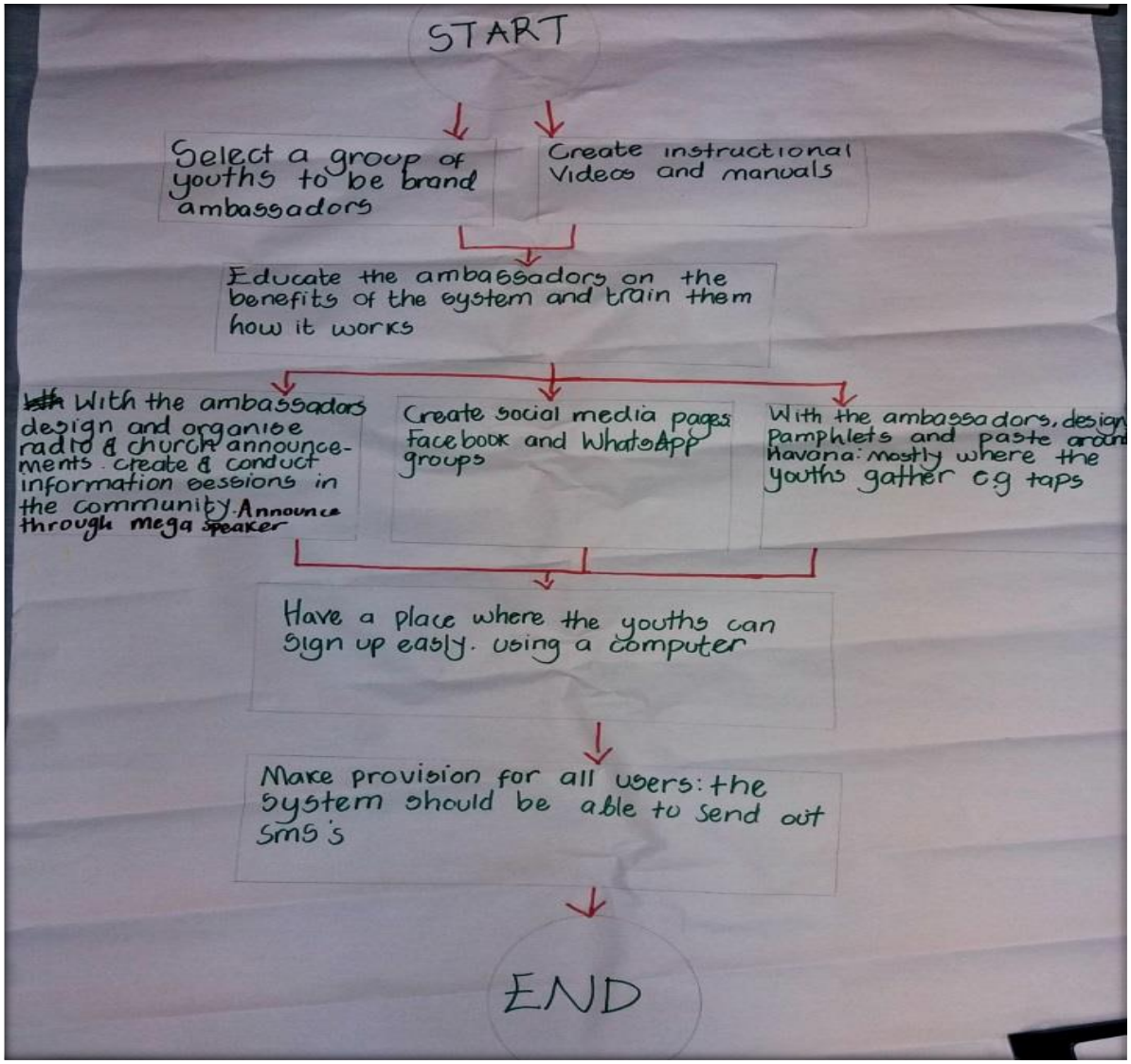


Figure 10: Adoption strategy on a flip chart paper

This workshop was co-hosted with colleagues engaged in different research activities. 23 youth were pitched with the different research initiatives and were free to choose the research study they were interested in participating. For this study, we wanted the youth that were interested to become ambassadors. We first explained the roles and responsibilities of ambassadors as explained in C1, AP1. The youth had a chance not to sign up and only then, they signed the list of becoming ambassadors. Fourteen youth signed up to be ambassadors in this instance, the ambassadors were responsible for ensuring that the Havana youth start using the NamStarter.

4.2.3.2 Training on the technology usage

During the training session, the youth were first introduced to the technology (NamStarter). The developer and the researcher explained the system first to all the ambassadors and later on, the ambassadors were divided into two groups in which they were explained the system in details. The ambassadors received training to be familiar with all the details of the crowdfunding system.

Figure 11: The developer (wearing glasses and a blue shirt) explaining how the system works to the ambassadors

The NamStarter is the first web-based crowdfunding platform in Namibia to support social entrepreneurs. There are three user types namely youth (seeking for funds), an administrator and the funder. The youth could be anyone seeking for funds, who wish to register and upload their projects. The administrator over looks and administers the site. The funder is any user who wishes to donate funding to any of the registered projects, raising funds via so-called campaigns. The use case diagram below shows the different usage scenarios.

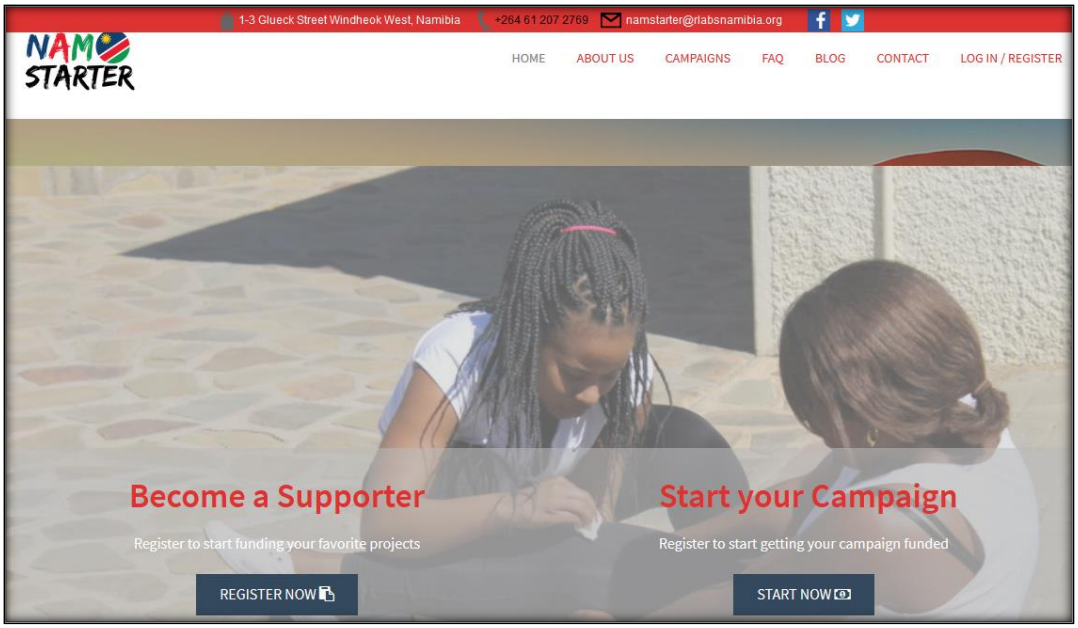


Figure 12: NamStarter homepage

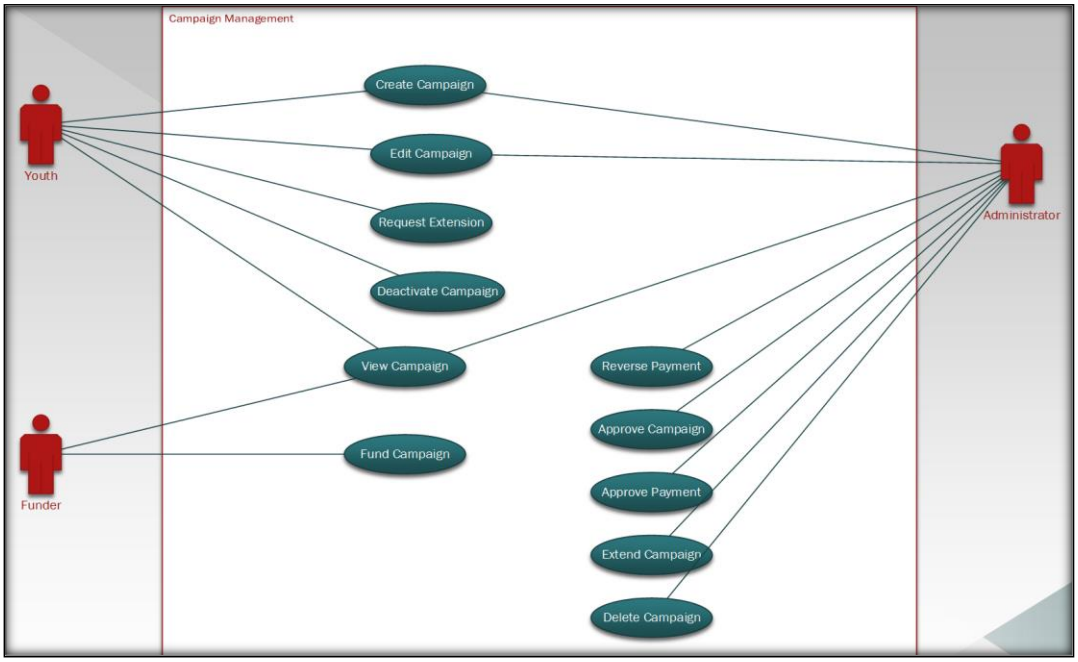


Figure 13: NamStarter User Case adopted from (Lungameni 2016)

When registering on the NamStarter, there is an option to create a project and that is done by filling in a form, with project details, description, project category, projected amount needed and the funding duration. The image below shows the first page when registering a project.

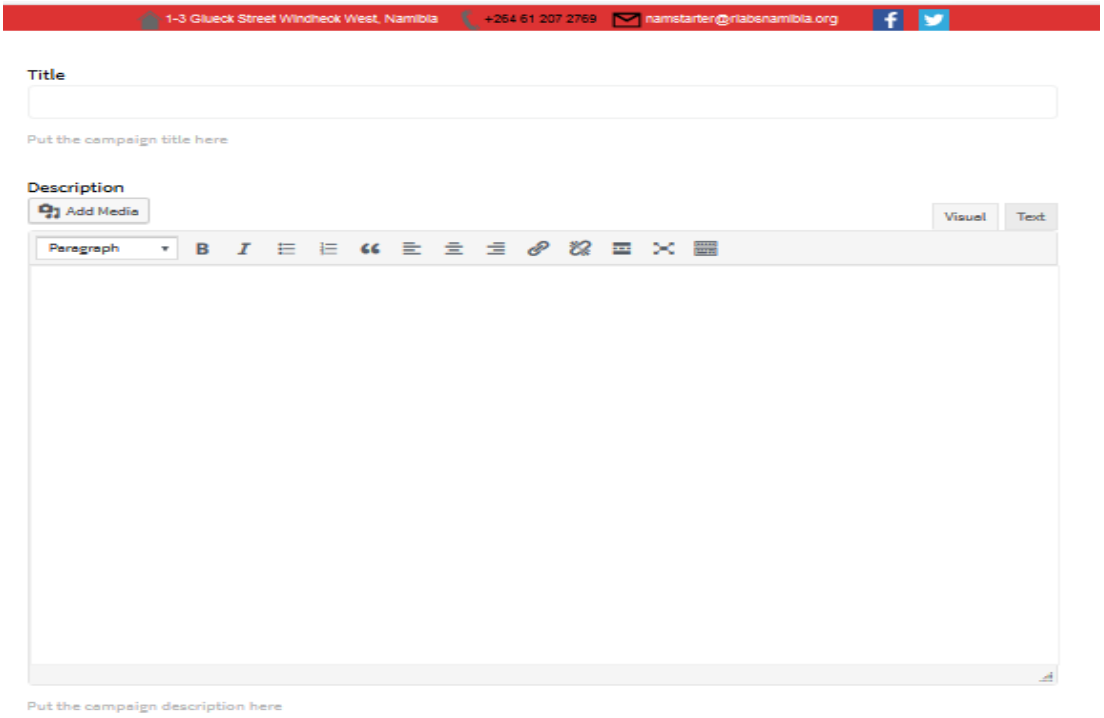


Figure 14: NamStarter registration page

During the training session, the youth were divided into two groups. We discovered that not all youths could use a computer very well. Therefore, there was a need to have at least one or two youths who can use a computer in each group. One of the youth could not understand English, thus the researcher translated everything in Oshiwambo.

After the training session, it was a clear indication that there is a need to work closely with the developers at the same time working with the ambassadors to ensure that the technology is well deployed.

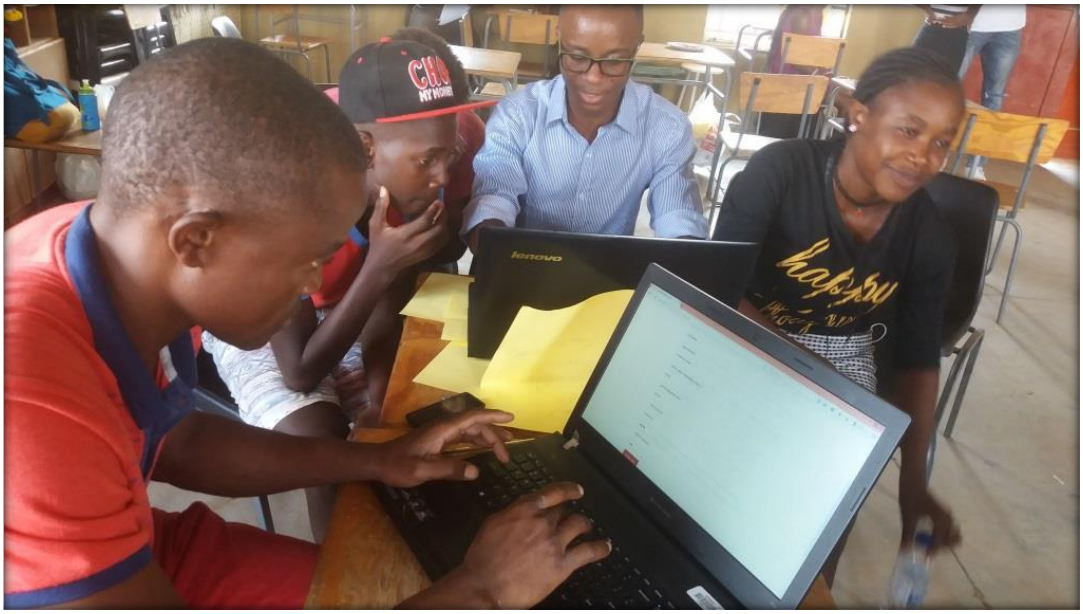


Figure 15: The ambassadors being trained on how to use NamStarter

4.2.3.3 Joint design of the adoption campaign

During the third session, the ambassadors chose to design the posters and create a Facebook page to create awareness of the NamStarter among their community. The youth divided themselves up into two groups, each youth choosing the group they want to be in. Each group was assigned a researcher to assist in case if they have questions. The group that chose to work on posters designed the two posters below.

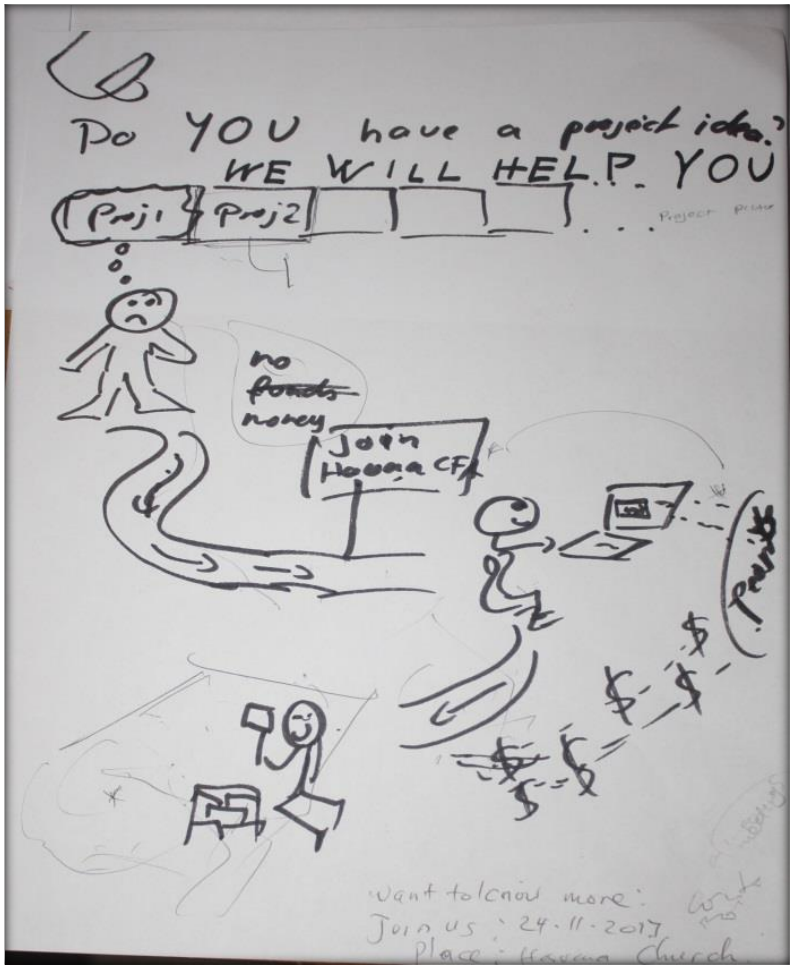


Figure 16: Poster calling all youth to sign up

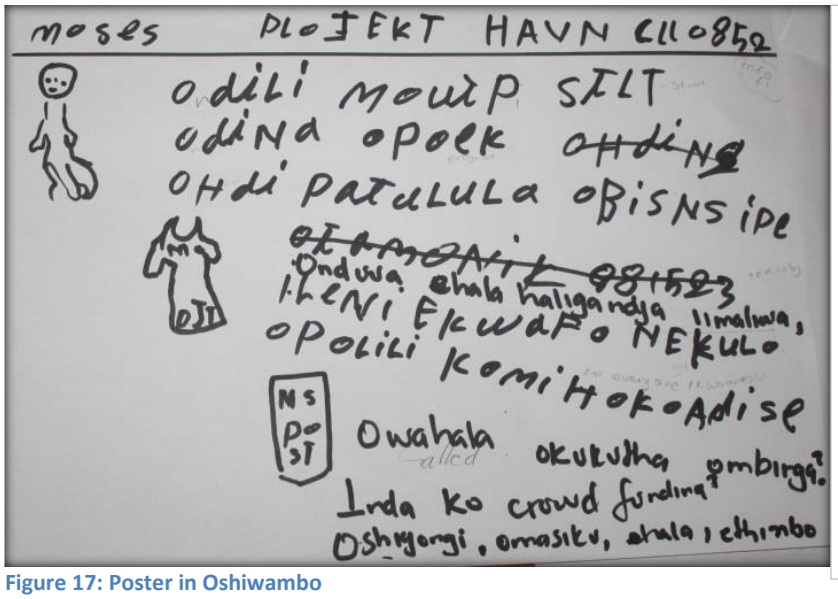


Figure 17: Poster in Oshiwambo

Figure 17 Translated in English reads as follows:

"Moses Project Havanna, call 085…

I am in Outapi Street

I have a project to open a new business

I have a place that gives out money

Help is for all people

Do you want to take part?

Come to the crowdfunding meeting

Date:

Place:

Time: "

The Team that worked on the social media design their campaign on a flip chart paper below:

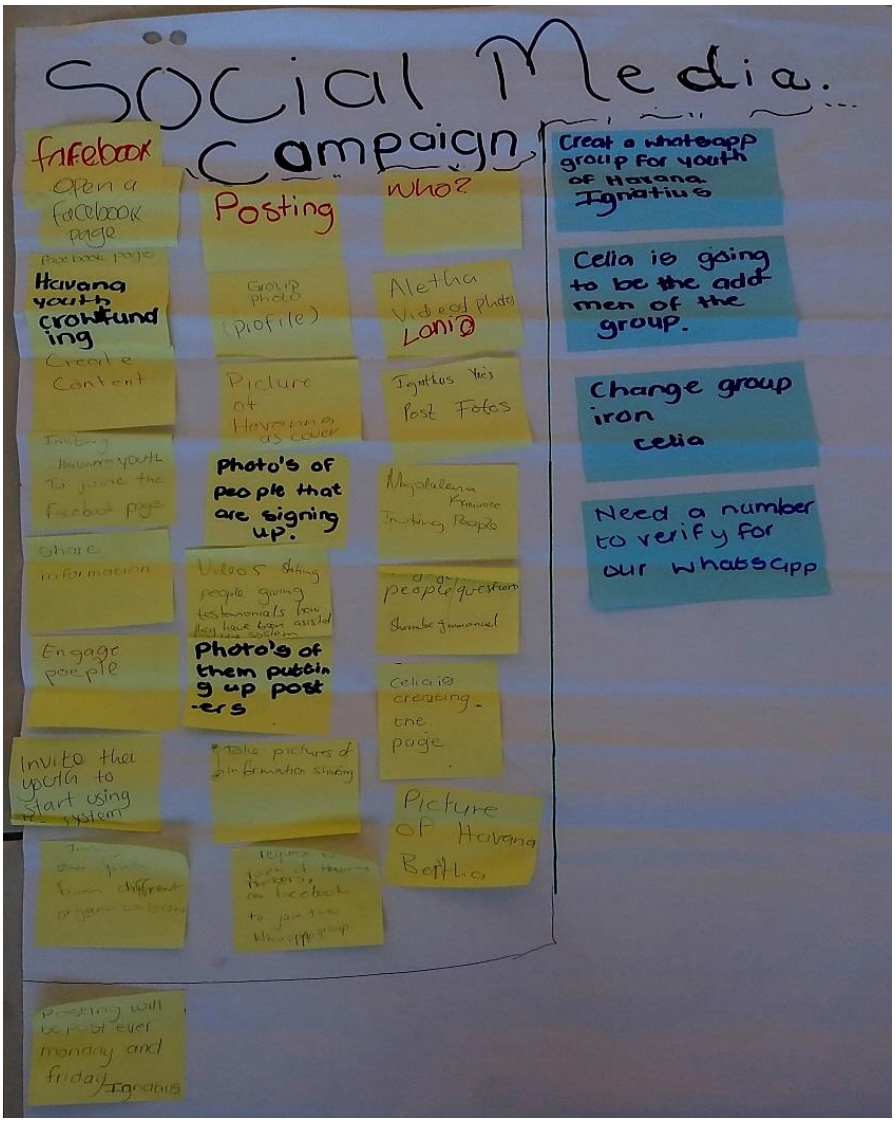


Figure 18: Social media campaign

The social media plan above contains the strategy on how the youth will go about creating awareness of the NamStarter on Facebook. The plan contains the name they will give to the Facebook page, who will be creating content. They also indicated that they would create a WhatsApp group where they can add people from Havana. Figure 19 shows the Facebook page created. The page is available on https://www.facebook.com/Havana-CrowdFunding-1401978409865122/ . The WhatsApp group created has only 18 members and all of them are ambassadors, they did not add other youth from the community.

Figure 19: The Facebook page

4.2.4 Cycle 1, Evaluation 1

The first evaluation of the adoption strategy was done by scrutinizing the action from all C1:A1. The main focal point was to evaluate if the youth understood the adoption strategy, the technology when it was introduced to them, will they be able to pass on the knowledge or introduce it to the youth in the community? Do they understand their roles as technology adoption ambassadors? The aggregated data was then used to propose a new plan of action that will be used in the next cycle of AR.

We discovered a lack of commitment among the ambassadors, and there was a high rate of absenteeism. We are of the opinion that they did not understand their roles in the adoption process, which led to their lack of commitment and them not thoroughly understanding the technology at hand. The other observation was that the posters they designed did not convey the right message to the public and there is a need to redesign them. Therefore, the following was proposed points need to be carried over to the redesigning of the adoption strategy.

Another discovery was that the youth did not really grasp the concept of the “crowdfunding system”. Most of them though that they will just get funds as long as they sign up on the system without considering that the main aim will be to at least social entrepreneurial projects.

Based on the evaluation done during the process of designing the adoption process, the following new actions were to be taken:

- Organise a commitment session
- Retrain the ambassadors on the content of the technology being adopted and
- Redesign the posters

The graph below illustrates in details the phase on the strategy the changes were proposed.

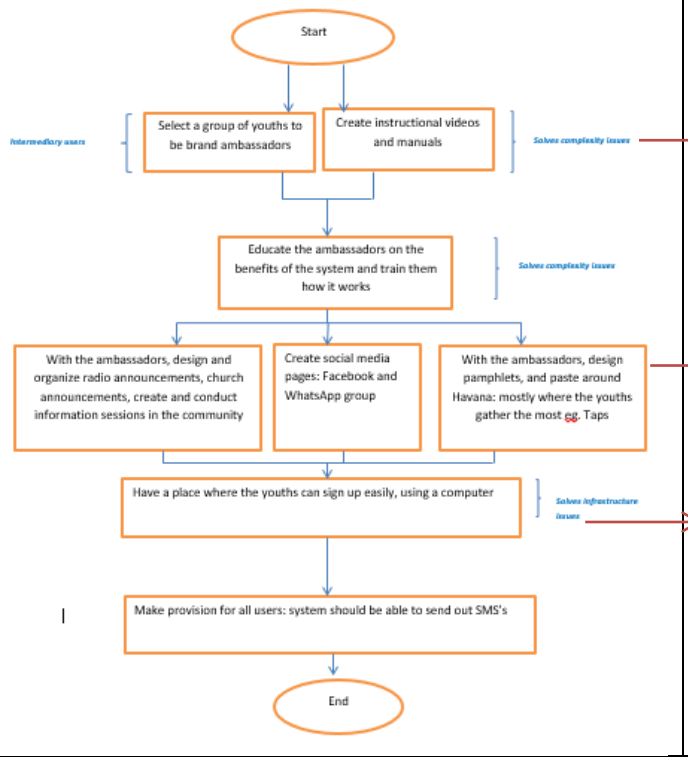
The adoption strategy	Problems discovered Reflection C1	Remedies Action planning C2
	1. Lack of commitment 2. Lack of understanding of adoption message to be send out 3. Lack of understand the technology	1. Commitment session 2. Redesign of the information material session 3. A Three (3) days training on how the technology works

Figure 20: Refining the adoption strategy

4.2.5 Cycle 1, Reflection 1

The initial plan in the cycle of designing an adoption strategy, we looked at the factors derived from other models in the literature review and some collected during the diagnosis phase. We however learned that the proposed strategy needed alterations to solve problems arising and there will be no

need to continue with all other activities. In the process, we learnt that most of the activities did not materialise and there was a need to strategise as proposed in the C1, E1. The refined activities in Figure 20 need to be addressed in C2, AP2 and test if it will work.

4.3 Cycle 2: Refining adoption strategy

The approach used to refine the adoption strategy was based on the evaluation and reflection from the first cycle of the AR. All data was collected through the means of two workshop sessions and questionnaires. All methods used are explained in details below.

4.3.1 Cycle 2, Action Planning 2

4.3.1.1 Dedicated commitment session

As a remedy to overcome the ambassador's lack of commitment, a commitment session needed to be planned. The session was designed applying the concept of mental contrasting theory, which is based on the facts of setting goals and identifying obstacles for better goal achievement (Goagoses, 2016). Goagoses (2016) developed a method used in the session in which the participants were to set a common goal, set their own related individual goals , The participants would then fantasise about the outcome once their goal is achieved, and end up thinking of the obstacles.

4.3.1.2 Campaign materials refinement

To overcome another problem discovered during the designing of the adoption strategy, a solution was proposed to redesign the posters. The ambassadors intended to use the posters to create awareness in the community and invite as many youth in the community as possible to start using the crowdfunding system. The posters created in C1, A1 were not conveying a convincing message to the readers and therefore a need for redesigning the posters was proposed. A session was then planned where by ambassadors and the researcher needed to look deeper on how the right message will be portrayed on the poster. The plan was that the youth have to redesign the poster analysing what is missing from the first posters and then creating one with the right message. The ambassador needs to develop the poster on the computer using Microsoft publisher in order to have the finished poster at the end of the workshop.

4.3.1.3 Content training

Another problem encountered during the designing phase of the adoption strategy was that the ambassadors hardly understood the concept of the crowdfunding system. During the time of formulating projects, the youths were requested to come up with projects that will bring good into their community. The idea emerged to ensure that the youths are not replicating what others are doing but rather to have projects that are unique and not only helping themselves but also helping their fellow community members. Thus, a special training program was designed with RLabs Namibia (see training programme in appendix 5).

The purpose of the training was too help the youth develop and describe their projects as social entrepreneurs, to support the youth with creating the right budgets for their campaigns and to upload the projects on the crowdfunding platform.

4.3.2 Cycle 2, Action 2

4.3.2.1 Dedicated commitment session

During the commitment workshop, the ambassadors were first tasked to write down the group goal of the technology adoption exercise, in this case “deployment of the crowdfunding system”, which was pasted at the centre of the board. After that, the youth had to write down personal goals towards achieving the group goal. Each ambassador then had to answer a short questionnaire (See appendix 4) consisting of close-ended questions.

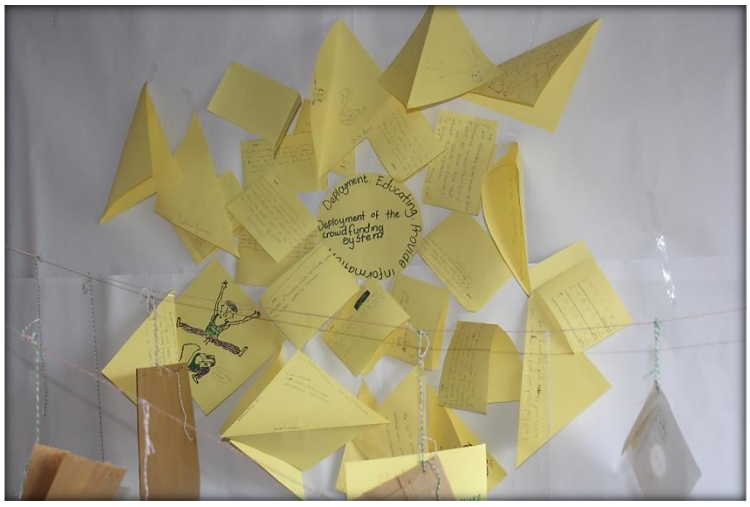


Figure 21: Main goal surrounded by individual goals

The table below shows the goals of all the ambassadors.

Ambassador	Goals
AM1	I will provide the information to my community by Havana by inviting the on Facebook. 2) I will invite them also at our support group, to part of this good idea of Havana project. 3) Will invite them through National radio.
AM2	I Bertha when I go back I will tell the people at home about the educating so we can stand up together for the active and look after our old people of Namibia.
AM3	I will take it internationally meaning informing the youth through radio, writing it on posters and posting it. Walking around the in location and inform the youth about it so that it can be known by whole community.
AM4	Info sharing: I would maybe achieve our goal by sharing the information about crowdfunding, by words of month or if there are things like posters to spread around Havana. For example: at sport fields, water taps, church, etc.
AM5	1) I make sure I listen actively/attentively and make sure I convince the youth to attend the workshop, so that they will empower the lives. 2) Gaining skill
AM6	I will take the message out to the people and have the system with them.
AM7	I would like to visit people house by house, like for houses a day to inform and explain more in details to them on how the system works for better life and for the future.
AM8	I will influence all the people of Havana community to know how to use it. I will be make sure that all the youth is educated about that system. To reduce and kill poverty in all age of people in community.
AM9	1) My goal is to target most the youths in the area. 2) To advertise more to the media. 3) To educate the youth.
AM10	I get an (option/opinion) to walk around telling people about how important is the system and all the benefits they will get.
AM11	Need to know how to apply the system and understand it.
AM12	I want to start a business with the aim to help the community. People need help and if I start a business I will help the community
AM13	I will providing information e.g. posting some information to the places where many people can be able to reach e.g. tap points, or soccer fields or at bus stop.
AM14	1) I will provide the information to my community by Havana by inviting the on Facebook. 2) I will invite them also at our support group, to part of this good idea of Havana project. 3) Will invite them on National radio.

Figure 22: Ambassadors goals

The ambassadors seemed to have a clear vision of the main objective of deployment of the crowdfunding system as their individual goals aligned with the overall objective. Upon evaluation of a short questionnaire, the following was established: Most ambassadors (10/14) were convinced that they would achieve their goals within a period of 6 months.

Nine of the ambassadors indicated it is very important to reach their goals, while the others equally attributed a rather high significance. Ten (10) ambassadors showed that they would be very disappointed if their goals are not reached. Then the ambassadors wrote and some drew how they will feel in future if they reach their goals. Both drawings and wordings indicated the youth would be happy if they reach their goals. The ambassadors also wrote on the paper bags any obstacles within themselves that will prevent them from reaching their goals. The following words were written down by the participants.

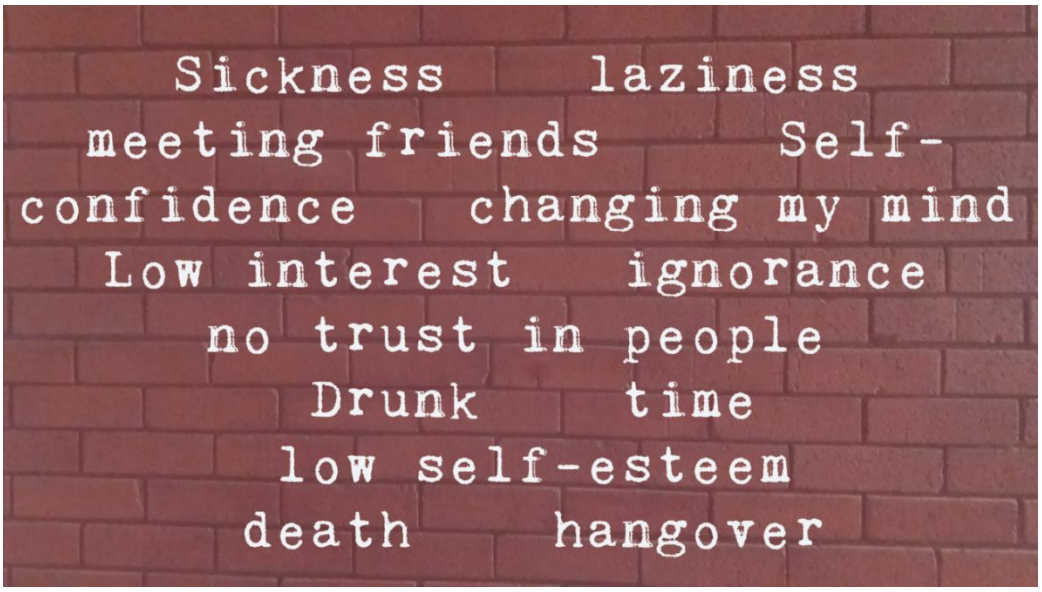


Figure 23: Obstacles

4.3.2.2 Poster refinement workshop

For this task, the ambassadors were divided into three groups. There were three ambassadors in one group and four in the other groups. There was a flip chart paper on each table and different colour markers and well as colouring pens. This set up was designed in such a way that it will help the ambassadors to draw their refined poster on paper first and they can later design their artwork on a computer. A laptop was set up on each group enable them with designing the poster on a computer. Each group had a user who knows how to use a computer. Firstly, a recap of the last session was done to remind everybody of what happened in C1, A1. Secondly, the first set of posters Figure 16 and Figure 17 were pasted on the wall where everybody can see it. The ambassadors then refined the poster in their group and each group had to do a presentation to display their new poster.

After the group work, all groups came together and formed one group, taking results from group designs to make one final poster. One of the ambassadors volunteered to lead the session by standing in front and getting ideas from others on what exactly to write on the final poster. Thirdly, the ambassadors in their respective groups designed the posters on a computer using Microsoft Office Publisher.

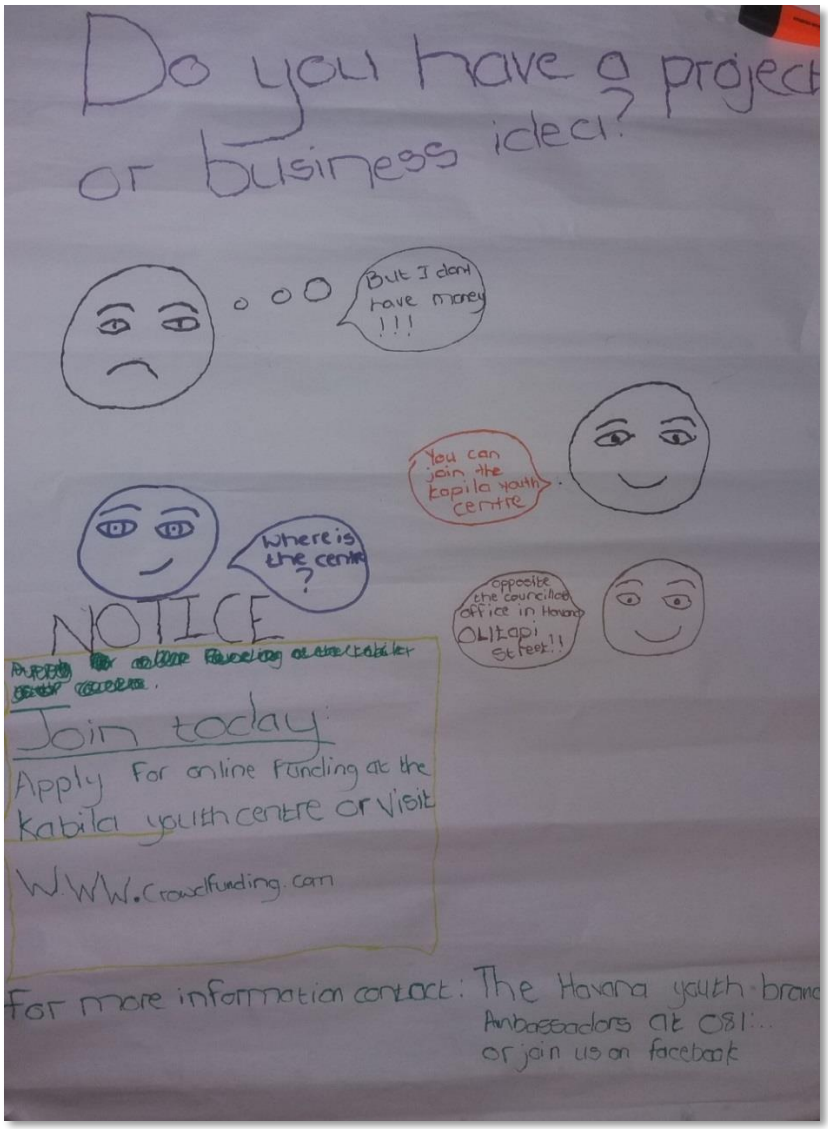


Figure 24: Redesigned poster

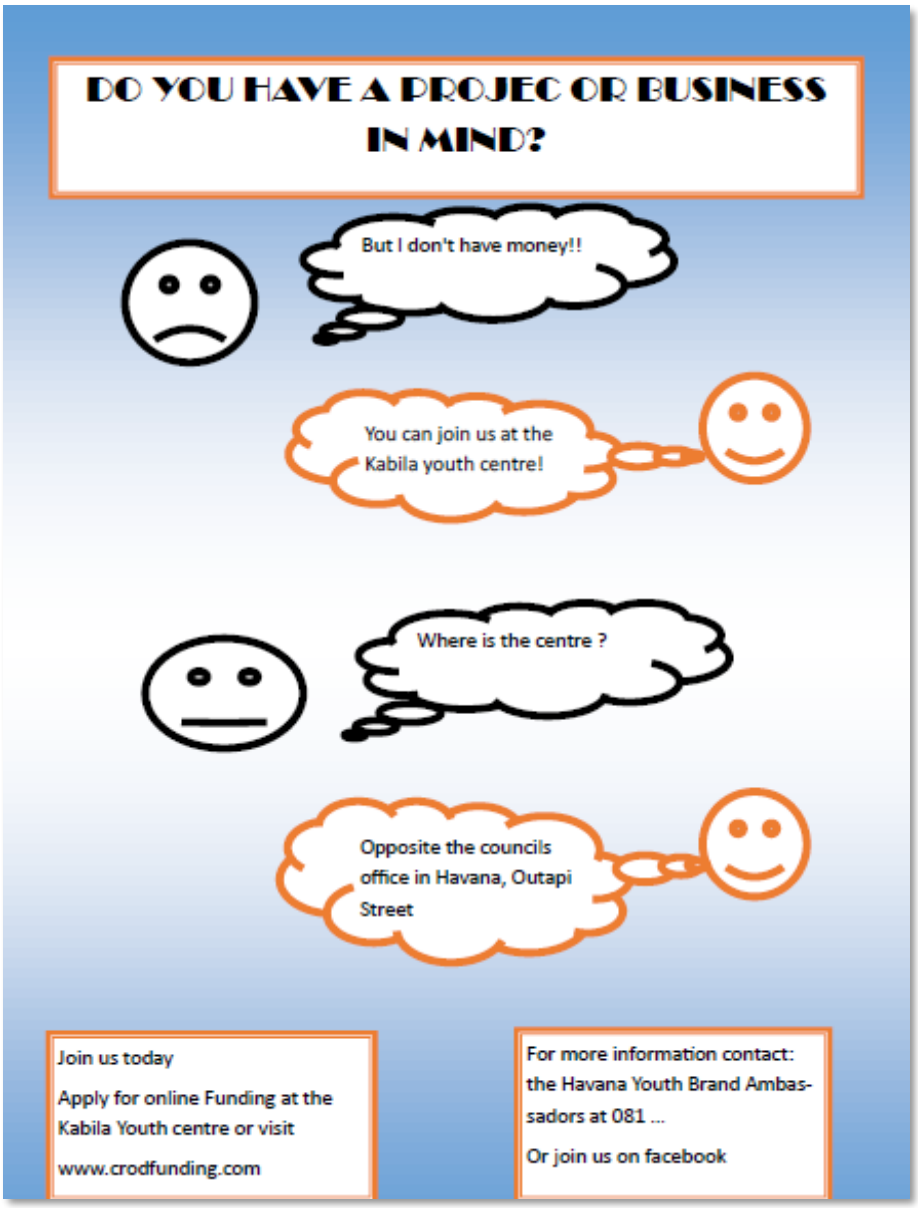


Figure 25: Poster designed on a computer

4.3.2.3 Content Training

The participants invited where the Youth Ambassadors as well as other interested Havana residents. The ambassadors also had the chance to invite more youths through posters, flyers and using the Facebook page. On the first day of the training, 25 youths attended of which 10 are ambassadors. On the second day, 24 youths attended of which eight were ambassadors, and on the third day, only 15 youths attended of which five are ambassadors.

From experience, the ambassadors demonstrated high rate absenteeism. Therefore, for this workshop, three reminders were sent as a method of ensuring that all the ambassadors attend. Firstly, RLabs Namibia sent an SMS whereby all ambassadors including the non-ambassadors were invited. Secondly, the researcher sent an SMS to the ambassadors only and thirdly the day before the workshop, the researcher called all the ambassadors to remind them of the workshop.

On the first two days of the training, the youths where sitting in a circle formed by chairs. The setup allowed them to share and discuss more freely in one big group. It also made it easier to form a group of 4-5 when they had to reflect upon the challenges they are facing in their community. The challenges they are facing and the possible project ideas that might be helpful to address these challenges. On the second day, the youth were still sitting in a circle and they had to stand in the middle of the circle when presenting their projects. This informal and flexible sitting arrangement was rather for the creative development and sharing phase of the workshop.

On day three, the room was set up in such a way that the youths could sit around any table in groups of three. There was a laptop on each table connected to the internet through a wireless router Fourth Generation (4G) connection. Furthermore, there was an assistant at each table, to help the youths if they are struggling to use a computer and to assist when necessary. This setup enabled the youth to formulate and type their project description, and to be able to upload it on the crowdfunding platform. The facilitators expected the youths to think of their projects in ways that will bring change into their community and be able to pitch their ideas to anyone interested in supporting them.

The youth received assistance from different researchers attending the workshop that day. The researcher at each table helped by ensuring that the project write up was convening before it is uploaded on the system.

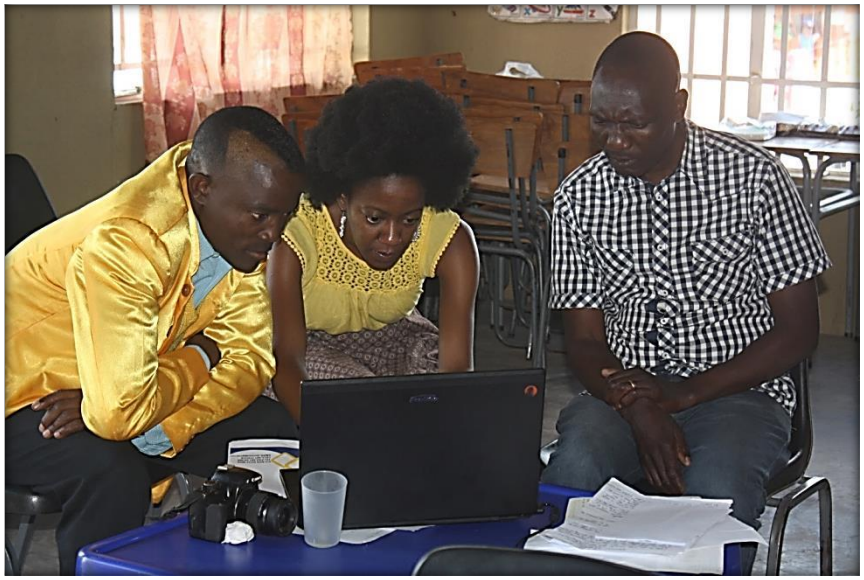


Figure 26: The youth receiving assistance with their projects by the researcher (woman)

4.3.3 Cycle 2, Evaluation 2

An evaluation of the refined adoption strategy was conducted in order to assess if the methods used for adoption of the Crowdfunding system were effective and implemented. The results were used for the development of the final adoption strategy. The participants invited were the youth ambassadors that participated in the previous engagements. We evaluated ambassadors 'goal achievement, methods used, attendance among other factors in relation to the overall success of attracting new users.

The set up was designed in such a way that the researcher only met with one ambassador at a time. The ambassador and the researcher were sitting at one table, with the adoption strategy (printed on Flipchart paper). The researcher had a questionnaire printed with each ambassador's individual goals and the group goal (See appendix valuation Questionnaire: C2:E2) as set during the commitment workshop. The researcher was the one asking the questions and trying to create a conversation with the ambassador instead of just giving the ambassador the questionnaire to answer. Each ambassador was scheduled for 10 minutes for the interview only. The longest interview lasted for 15 minutes, but most of the ambassadors managed to finish in 10 minutes. The results below were collected from the one on one session with the ambassadors.

4.3.3.1 Individual goal achievement vs reality

All the youth have indicated that they have somehow reached their goals even though the outreach did not lead to new people using the NamStarter. For instance, one ambassador's goal was *"Info sharing: I would maybe achieve our goal by sharing the information about crowdfunding, by words of month or if there are things like posters to spread around Havana. For example: at sport fields, water taps, church*". Because he did what he set was out to do, he assumed he achieved his goal even though it did not yield any results nor did convince anyone to sign up on the system.

One observation was that the ambassadors did not understand that they will only reach their goal by successfully convincing other youths to sign up, register their projects and educating them how the system works, but not necessarily by the action of posters, sending SMSes. The table below shows the ambassadors goals and the quantified percentages of their success. The success rate was determined by the relative number of people each ambassador invited. The highest number recorded was 12, example (**n**- number of youth invited **/** highest number ***100 percentages).The table below shows that that AM 9 managed to invite more youths, which led to 100% success rate.

The results in this table precisely show that, even if the ambassadors have carried out the activities they set in their goals, the results are extremely low. The results will only reference to the ambassadors that managed to fill in the questionnaire.

Ambassadors	Goal	Success rate
AM9	My goal is to target most the youths in the area. 2) To advertise more to the media. 3) To educate the youth	100%
AM11	Need to know how to apply the system and understand it	33%
AM6	I will take the message out to the people and have the system with them	33%
AM8	I will influence all the people of Havana community. I will make sure that all the youth is educated about that system. To reduce and kill poverty in all age of people in community	8%
AM5	I make sure I listen actively/attentively and make sure I convince the youth to attend the workshop, so that they will empower the lives. 2) Gaining skill	8%
AM3	I will take it internationally meaning informing the youth through radio, writing it on posters and posting it. Walking around the in location and inform the youth about it so that it can be known by whole community	8%
AM4	Info sharing: I would maybe achieve our goal by sharing the information about crowdfunding, by words of month or if there are things like posters to spread around Havana. For example: at sport fields, water taps, church, etc	0%

Table 6: Individual goal Vs reality

4.3.3.2 Individual goal VS group goal achievement

Surprisingly, most of the ambassadors disclosed that they have not really achieved the group goal even though they achieved their individual goal. The individual goal was supposed to be feeding the group goal. Perhaps their reason was that they did what they set out to do, but their actions did not materialize to reach the group goal. These findings are a bit contradicting their responses to the individual goal achievement. The diagram below shows that the ambassadors achieved the individual goal, but they did not reach their group goal. Only few of the ambassadors indicated that they have reached their group goal. Perhaps those ones managed to invite other youths to attend.

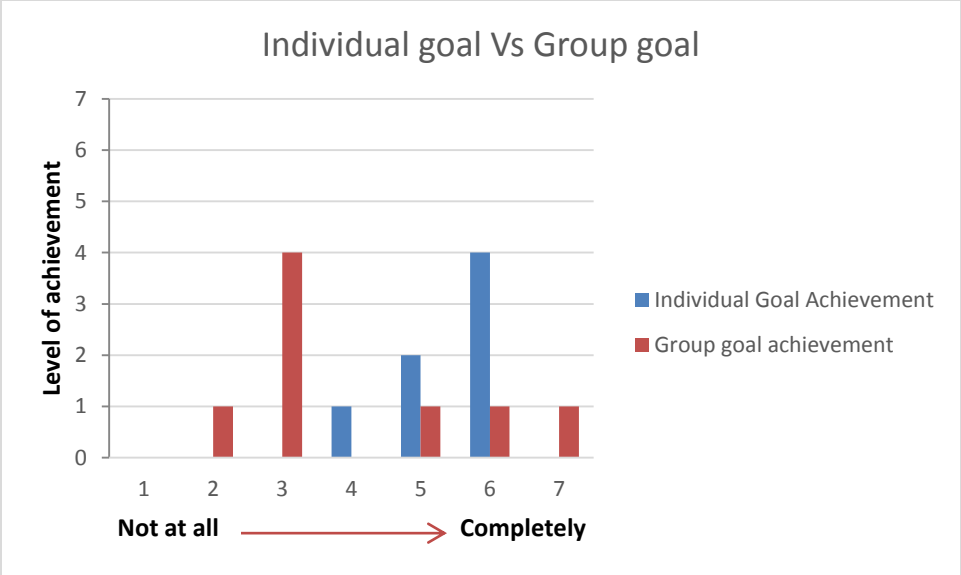


Figure 27: Individual goal Vs Group goal

4.3.3.3 Individual goal achievement and commitment to work on their goals

The analysis regarding commitment shows that the ambassadors thinks they have reached their goals and they also want to continue working on them. Bearing in mind that the ambassadors persistently showed the desire to work on reaching their goal, this could be because they have different believes of goal achievement. All the youths that have showed interest in continuing towards their goal have responded with the activities they will be doing.

4.3.3.4 Number of people invited and medium used

After examining the number of invited youth per ambassador, we are assuming that it could be because those that have managed only to invite one person or none is because they have missed some of the

session. For instance, of all eight ambassadors AM4 was absent during the training session. We thought his absence did not motivate any of the people he has invited to attend.

Each ambassador managed to invite few youths to the training sessions and to workshops. They indicated that most of the people invited where never interested due to different reasons. We think that the mediums used by the ambassadors to invite other youths were not effective or perhaps the approach used was not the right one. The most widely method used was face to face invitation, posters plus brochures as well as calling. However, a follow up question to those that managed to invite some revealed that they used extra methods. For instance, AM9 indicated that the success came by providing transport/taxi money to the youth.

Ambas-sadors	Medium used	Suc-cess
AM9	Visiting the youth and telling them, whatsApp and also called the youth	12
AM11	I visited the system (checked it out)	4
AM4	Inform (word of mouth), Posters at sport field, water taps	0
AM8	Talked to the people, Distributed brochures and on the internet	1
AM5	I told them what the project is all about, the advantage of starting a business and budgeting	1
AM3	House to house, walking around	1
AM6	Face to Face, Phoning friends	4

Table 7: Number of people invited and medium used

a. Analysis of the attendance

An analysis of the attendance list indicates no specific pattern leading to high rate of drop out. Table 8 below shows that 54% off the ambassadors did not commit to complete the adoption process and they dropped out. At least 40% did not return on the third day of the session. Unfortunately, a follow interview with those that have dropped up was not conducted thus reasons can only be speculated upon.

	Workshop attended							
Ambassadors	3/7/2017	3/14/2017	3/25/2017	4/24/2017	4/25/2017	4/26/2017	6/14/2017	Success rate
AM9	☒	☒	☐	☒	☒	☒	☒	100%
AM6	☐	☒	☐	☒	☒	☒	☒	33%
AM11	☒	☒	☒	☒	☒	☒	☒	33%
AM8	☒	☒	☒	☒	☒	☒	☒	8%
AM5	☒	☒	☒	☒	☒	☐	☒	8%
AM3	☐	☒	☒	☒	☒	☒	☒	8%
AM12	☒	☒	☐	☐	☐	☐	☐	0%
AM10	☒	☒	☐	☐	☐	☐	☐	0%
AM4	☒	☒	☒	☒	☐	☐	☒	0%
AM14	☒	☒	☐	☒	☒	☐	☐	0%
AM2	☒	☒	☐	☐	☐	☐	☐	0%
AM13	☐	☒	☐	☐	☐	☐	☐	0%
AM1	☐	☒	☐	☐	☐	☐	☐	0%
AM7	☐	☒	☐	☐	☐	☐	☐	0%

Table 8: Ambassadors attendance

We have learned that full attendance was no guarantee for success. Hence, some of the ambassadors attended all days, but they still did not manage to get a 100% success rate.

4.3.4 Cycle 2, Reflection 2

Reflecting back on the refinement of the adoption strategy, we have learned that the approach used with the ambassadors was not flawless yet. There is a need to look at other factors that advance the deployment process in Havana, at the same time learning from the evaluation on C2;E2. During the evaluation phase, we have learned that the ambassadors still did not fully understand their tasks to achieve the common goal. Hence, a clear understanding should have developed when the goals were being developed. For instance, ambassador AM4 goal was "*Info sharing: I would maybe achieve our goal by sharing the information about crowdfunding, by words of mouth or if there are things like posters to spread around Havana. For example: at sport fields, water taps, church, etc*". The feedback the ambassador gave during the evaluation was that most of the activities are done, and that means the goal have been reached. In actual terms, the ambassador did not manage to invite a single youth to sign up on the system, which means that even if all the activities were done, the actions did not contribute to

reaching the main objective, despite this, the ambassador judged the method successful. We therefore concluded that the tasks the youth carried out such as designing of posters and social media was inefficient.

A high rate of dropout rate was recorded during the training. Unfortunately, the youth that dropped did not give reasons and a follow up with them was not made. It could have been vital to know the reason to help plan better in the next cycle.
During the evaluation process, some of the youth indicated that they would want the following: be formally recognised and visible in their communities (based on this we gave them tags). The second one was to get data bundles to be able to share on social media (we gave forms instead because the social media strategy used in the past did not work out) and the third one was to get incentives, and we provided branded T-shirts and project money.

Thus, for the next cycle we will introduced a new strategy, that will potentially motivate the ambassadors and their effort in contributing to reaching the goal will measured. The new strategy will document how the ambassadors recruit other youth, and they will be the one to influence from the start until they sign up on the system. It will be worth it to try and use the concept of commission whereby if a youth invites another youth, they get a certain percentage paid to their own projects registered on NamStarter (Magloff, 2017). The only difference is that, instead of getting the payment in cash, the funds will be paid into the ambassadors projects registered on NamStarter.

4.4 Cycle 3: Establishment of the adoption strategy

4.4.1 Cycle 3, Action planning 3

The plan used to establish the adoption strategy in this phase was informed by the reflections in C2, E2. The following plan was formulated in a flow chart below, which was to be executed within a period of 5 days.

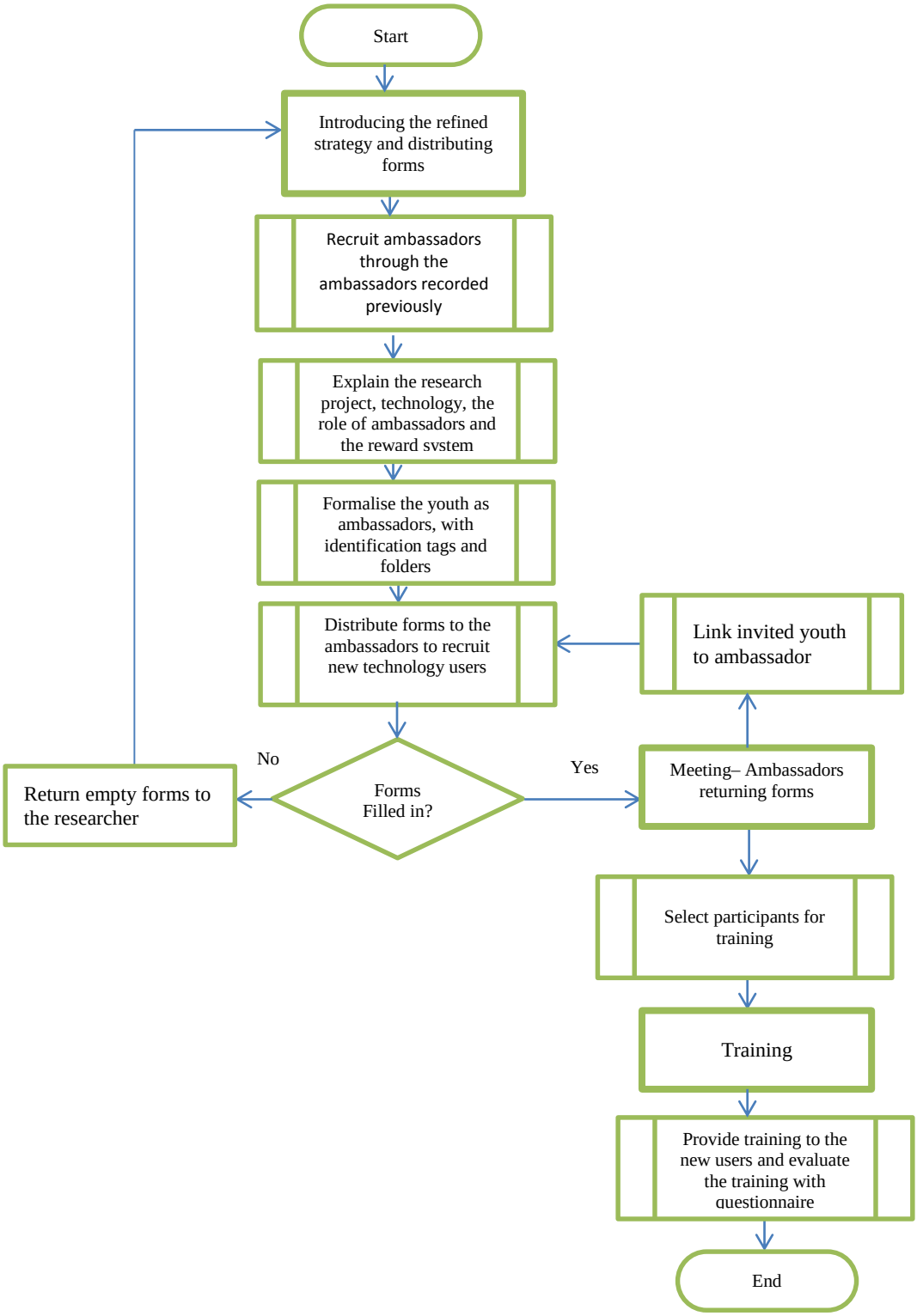


Figure 28: Action Plan to establish an adoption strategy

4.4.1.1 Reward system

The rewards given to the youth were administered as follows:

- Get a name tag, a file to carry forms in
- Get a T-shirt upon return of 5 forms or more
- Get a N$100 on your own project upon successful upload of project of recruited person
- The new people will get a certificate for the training (not a T-Shirt). Only recruiters (ambassadors) get T-Shirts

4.4.1.2 Selection system

The youth needed to meet the following criteria to be admitted in the training:

- Lives in Havana, be youth (under 35 years)
- Need to have a social or Environmental Projects, not only focused on business ideas (i.e. own money making)
- Diversity of projects (to prevent similar ideas)
- Projects should be already developed to a basic stage

4.4.2 Cycle 3, Action 3

The deployment of the final proposed strategy was based on the results derived from the second cycle of refining the adoption strategy and the proposed plan in C3:AP3. ” . The participants invited to participate are described below:

For the first session, the researcher invited all youth ambassadors that were involved in a testing the first strategy. The ambassadors were also tasked to invite other youth in their community. Eighteen youths attended, all recruited to be ambassadors. The second meeting was held between those from the first session only. The third engagement was the training that was carried out for 3 days; the participants were the new recruits as well as those from the first session that did not have a project registered on the crowdfunding system.

NB: the ambassadors in this section are not entirely those that participated in the design and refinement of the adoption strategy.

4.4.2.1 Session 1 – Introducing the refined strategy and distributing forms

For the distribution of forms and the formalisation of the ambassadors, the researcher invited all youth ambassadors that were recorded previously. The ambassadors were tasked to invite other youth in their community to become new ambassadors. Eighteen youths attended, and they were all recruited to be formal ambassadors. The session was set up in such a way that all youth attending are treated, as they have never heard of the system "NamStarter" before. The researcher gave an introduction of the main purpose of the visit to Havana, and explained in details what the ambassador's role will be. The researcher also informed the youth of the reward system that will be used to ensure that those who work hard are rewarded. In this instance, it was a T-shirt for at least five filled in forms returned and a N$100 for each uploaded project onto NamStarter.

The youth got a chance to ask any question in case they needed clarity. An attendance register was circulated for the youth to sign up and for their consent. The register was being circulated during the question and answers time. After all registers were filled in, the researcher was sitting in front of the youth and calling the names on the register one at a time for the youth to get their name tags with lanyard's, forms to recruit other youth and a file they can put their forms. Each youth could indicate the number of forms they would like to distribute. All the forms were to be returned filled in or not. This is because the researcher would like to keep track of the number of forms returned either filled or not. The researcher was writing the names and a cell number of each youth on the tag that time. The nametags were to identify the youth in the community. On the tag, there was a text describing their purpose and the contact details of the researcher, in case the community members wanted to verify if the youth are legitimate. An assistant researcher was helping to put the lanyards on the tags and hand out files. The youth were dismissed the moment they received their items. The picture below shows the sample nametag used.

Figure 29: Front of the nametag

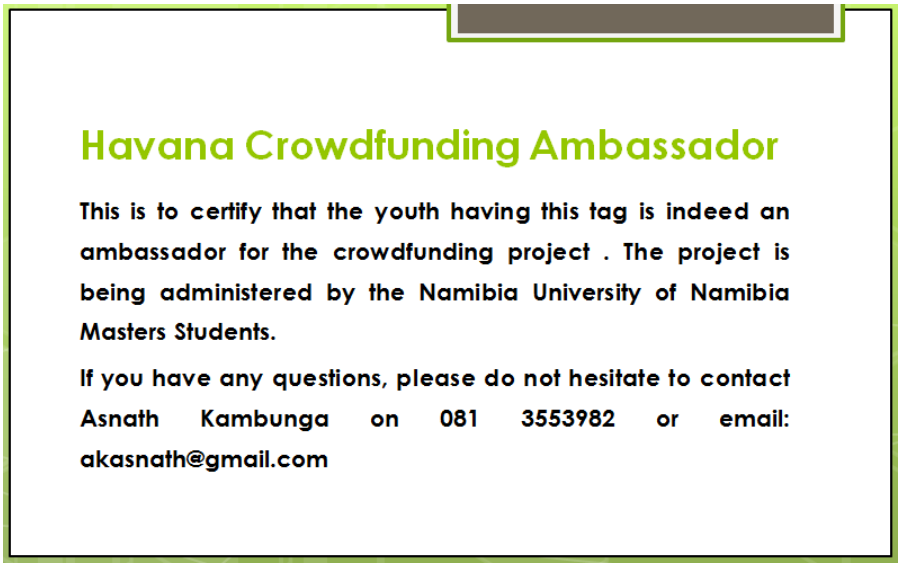


Figure 30: Back of the nametag

Figure 31: Ambassadors receiving their forms and tags

4.4.2.2 Meeting– Ambassadors returning forms

This meeting was held 6 days after session 1. The main purpose was to collect the filled in forms the ambassadors received during session 1. Before this session, the research sent out short text messages (SMS) to the ambassadors two times. The first SMS was send 4 days after the first session. The idea was to motivate the youth to work hard and make sure that they recruit as many people as possible and ensure all their forms are filled in. The second SMS was sent in the morning hours on the session day to remind the youth of the meeting, and still with the encouragement of the awards, they will get at the end.

On that day, the researcher had a list recording the number of forms returned by each youth. The researcher had to record the number of forms filled or not. The meeting was very short, as the youth were only dropping of their forms. However, the researcher stayed at the centre for 1 hour waiting for those that might come late. At least 125 forms were collected, with 48 empty and 84 filled. Some ambassadors managed to reach more people and brought back extra 7 forms. The forms were evaluated against the requirements in C3, A1 in order to select the successful candidates for the training session.

4.4.2.3 New user training

The third session was the 3-day training offered to the newly recruited users. The training was carried out by RLabs Namibia. RLabs Namibia offered the similar training during the first round of testing of the adoption strategy. The participants were selected using the forms returned by the ambassadors.

Figure 32: Training day 1

On the third day of the training, the youth received help with uploading their projects on the system. There were eight facilitators from RLabs with laptops. Each facilitator was sitting with a group of at least five youth. Since there is no internet connection at the venue, the researcher used her own 4G portable router, which connected all eight computers to the internet. The youth had their projects well described on paper already. The RLabs staffs were only assisting with uploading the projects on the system, as not all youth are computer literate. On this day, 26 projects were successfully uploaded on NamStarter.

Figure 33: RLabs Assistants with the youth

4.4.3 Cycle 3, Evaluation 3

4.4.3.1 Evaluation ambassadors

The approached used with the ambassadors in this section proved to be of substance. The ambassadors were highly driven and they performed tremendously well. We were able to capture the relationships from the point they were recruited and the number of new users they recruited. The diagram below shows how the ambassadors were first recruited. Eighteen youth signed up to be ambassadors, of which eight were females and ten were males. The green nodes represent those that invited other youth and the black nodes represent the youth that only attended. The nodes labels represent the ambassadors to guarantee anonymity. The graph shows that only 3 youth from the old ambassadors group attended and the rest were invited by AM14. Interestingly, only two new youth AM10 and AM18 invited other youths. There was also AM5 who attended without an invitation. The node shows like a loopback because it is recorded that AM5 invited itself.

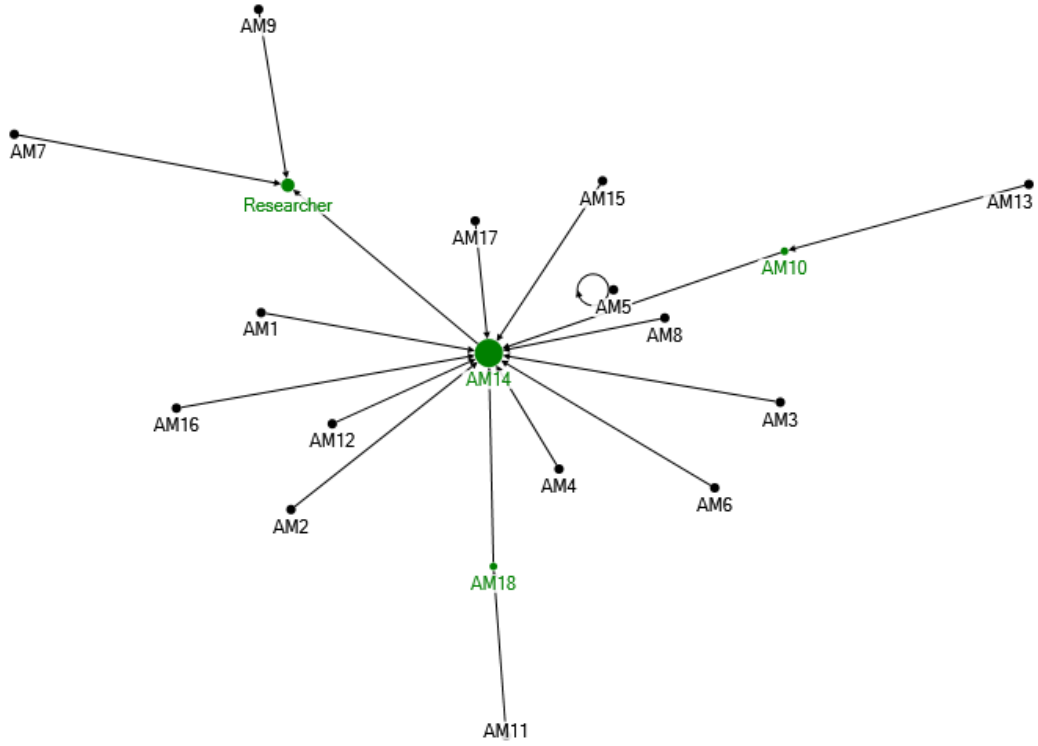


Figure 34: Ambassadors Round two (2)

4.4.3.2 Recruitment of the new users

The diagram below display the number of people each ambassador invited. There were 37 females and 47 males. The diagram below shows the green nodes as ambassadors and nodes connected as those invited. The red square nodes connected with purple edges represents those that were invited, managed to go through the training provided during session 3 and upload their projects on the NamStarter. The purple loop back nodes also mean that the ambassador invited him/herself and managed to upload their project. The other normal black “nodes” did not go through the training and their projects were not uploaded on the system. The green node sizes imply how large the invited group is. The data was analysed using Microsoft excel and NodeXL.

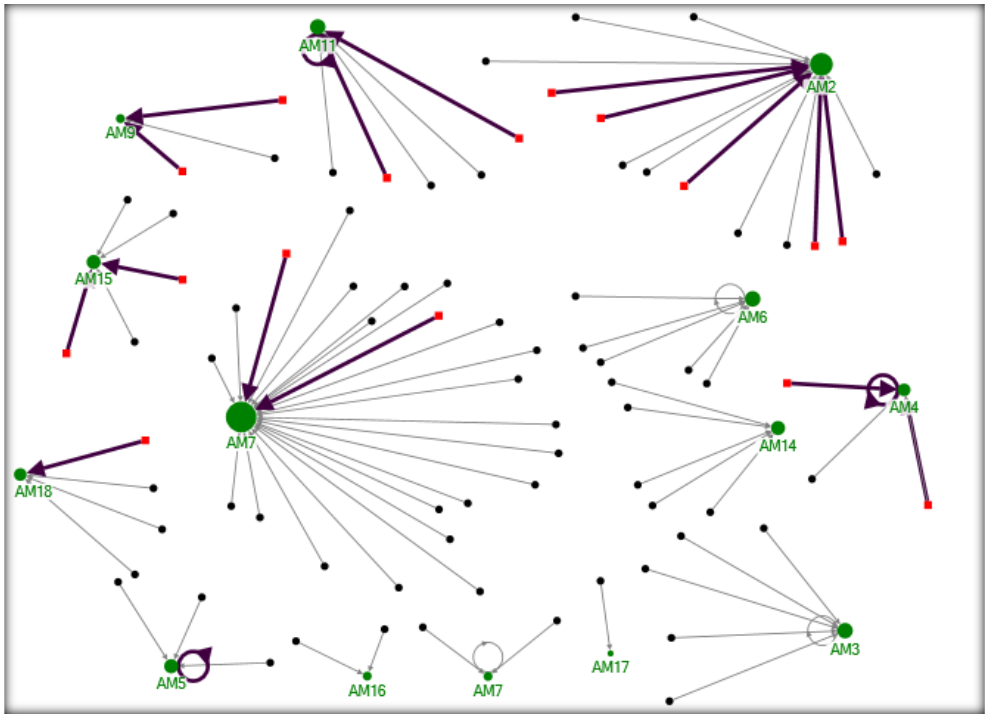


Figure 35: Graphical representation of ambassadors and the youth invited

Ambassador	Forms received	Forms returned filled in	Not filled in	Extra forms returned	Getting t-shirts	Number of related projects uploaded	Getting 100
AM1	5	0	5	0	0	0	0
AM2	10	13	0	3	1	4	400
AM3	10	6	4	0	1	0	0
AM4	5	4	1	0	0	3	300
AM5	5	5	0	0	1	1	100
AM6	7	6	1	0	1	0	0
AM7	6	4	2	0	0	0	0
AM8	20	23	0	3	1	3	300
AM9	5	2	3	0	0	1	100
AM10	10	0	10	0	0	0	0
AM11	5	6	0	1	1	3	300
AM12	3	0	3	0	0	0	0
AM13	11	0	11	0	0	0	0
AM14	5	5	0	0	1	0	0
AM15	5	5	0	0	1	2	200
AM16	5	2	3	0	0	0	0
AM17	6	2	4	0	0	0	0
AM18	2	1	1	0	0	0	0

Figure 36: Ambassadors and participants

4.4.3.3 New users' feedback

There were 25 respondents (new users) to the questionnaire. The results from the questionnaires have provided abundant feedback to verify if the training was necessary. All the youth who attended the training indicated that it was helpful. One of the participant said:" It gives me hope of coming up with something that will benefit my community members rather doing something for myself". The feedback did not only help the youth understanding what is needed for them to upload their projects on the system, but it also served other purposes such understanding the need to have projects that have an impact in their community.

Initially, the training was supposed to be for the youth only, but there was a turnout of people not classified as youth by the Namibia Statistics Agency, (2015). The trainers could not eliminate them as they showed interest in attending.

4.4.3.4 Evaluation of the system deployed

The adoption strategy was validated against the crowdfunding system "NamStarter" "http://NamStarter.RLabsnamibia.org/". NamStarter was developed and deployed in line with the development of the strategy.

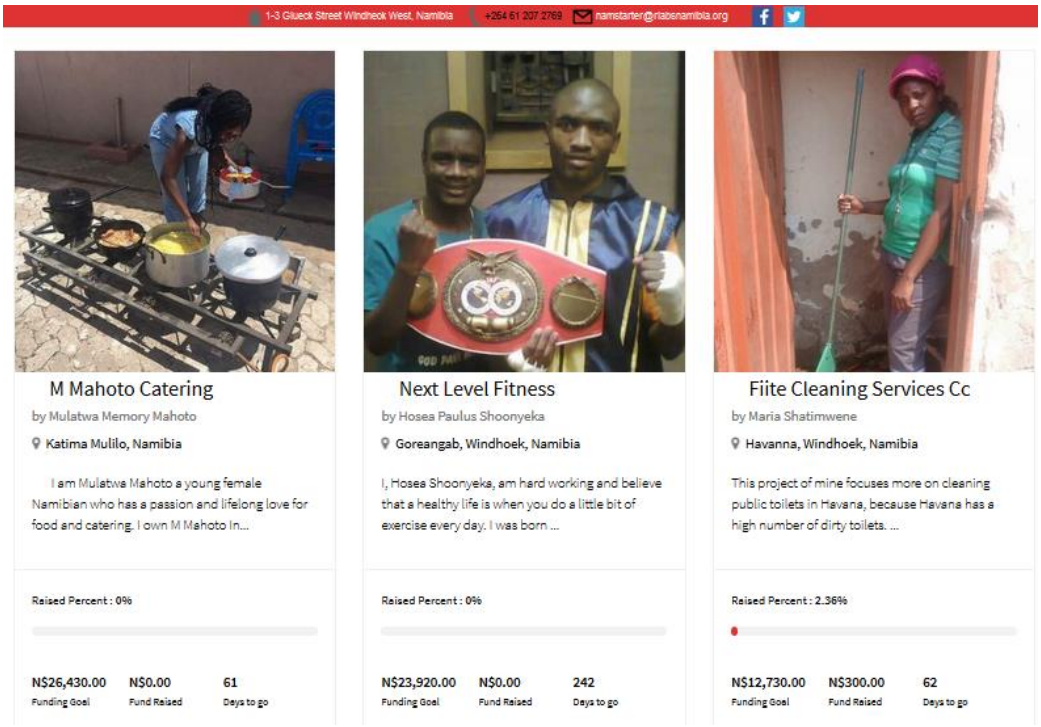


Figure 37: Over view of projects on NamStarter

The NamStarter is successfully operating, showing statistics on how the system is currently being used. There are currently 38 projects uploaded from Havana with 32 partially funded (4 December 2017). While it was successfully deployed in Havana,. RLabs Namibia is currently promoting the website in Namibia and overseas to support the Havana youth project promotions. Thus far, the Havana youth project owners under the mentorship of RLabs, are devising strategies to attract more funders to their projects. The visitor numbers are steadily increasing thus we are hoping that the number of funders continues to increase over time.

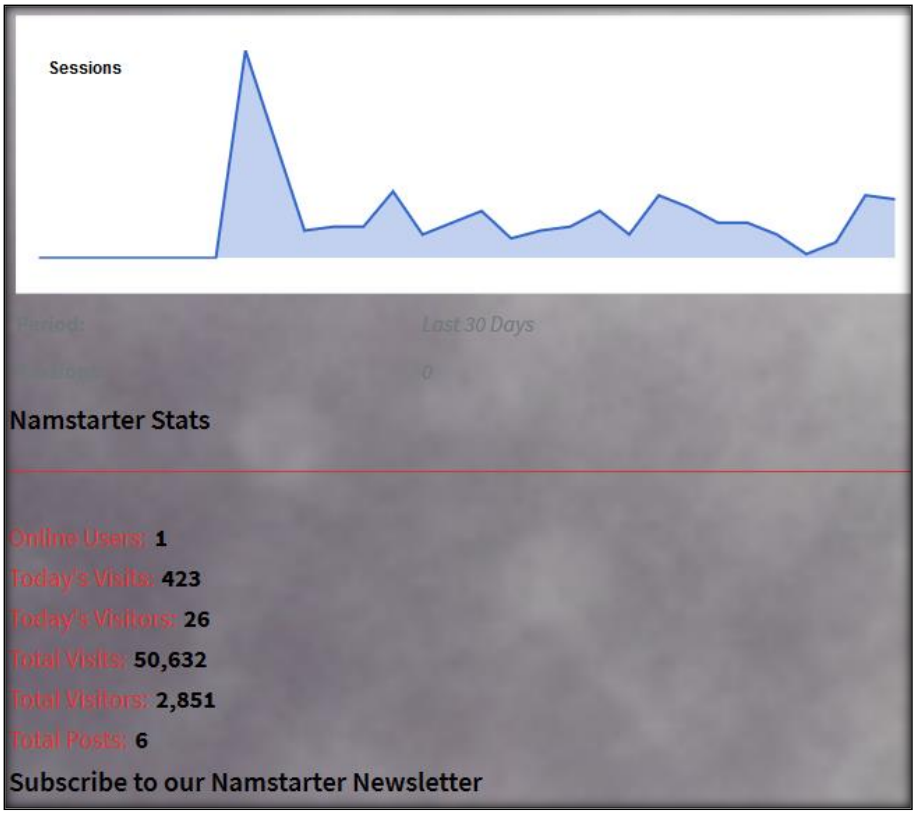


Figure 38: NamStarter statistics

4.4.4 Cycle 3, Reflection 3

Reflecting back on the establishment of the adoption strategy, we have recognised the improvements comparing to the prior attempts to deploy the system in Havana. In previous attempts, we used the top down approach whereby the ambassadors were tasked to execute the adoption plan, yet they were not users of the system. Whereby, at this stage we learned that the ambassadors are more likely to recruit others to use the system, if they have a better understanding of the system by being users of the system, at the same time providing testimonies to others if it worked for them.

We have observed that the ambassadors were highly motivated by the rewards. It will be worth to validate if the youth will be eager to engage in an adoption process, which has no monetary value. Perhaps other stakeholders with technologies (systems) to be deployed in Havana will have different incentives. It would be better to verify if other form of incentives will sensitise the youth to get involved in such a technology deployment process. Based on the refined strategy, it was very helpful giving

information about the technology to the ambassadors to distribute while they are recruiting. It is therefore important to continue with this activity. It will be worthwhile to encompass the following in the new model

1. Distribute information regarding the benefits of the technology. It will be at this stage to explain the benefits of being an ambassador
2. Formalise the ambassadors engagement
3. Training on how the technology works

CHAPTER FIVE

5. DISCUSSIONS AND PROPOSED MODEL

Firstly, we contemplate on the contextual and empirical situation, we then rethink underlying theories and draw up the final technology adoption model merging empirical and theoretical concepts.

5.1 Revisiting factors

Having collected data throughout the research we are now re-examining the factors related to existing models and establish their relevance for a contextually appropriate technology adoption in Havana. The table below shows that most of the factors do not contribute to the actual system use by the Havana youth.

Model Factor	TAM	MM	TRA	TPB	RID	UTAUT	MOP TAM	Havana youths
Perceived ease of use	Yes			Yes	Yes	Yes	Yes	No
Perceived usefulness	Yes		Yes	Yes		Yes	Yes	No
Behavioural intentions (enjoyment, goal orientation, and self-efficacy**)**	Yes	Yes	Yes	Yes		Yes	Yes	No
Entertainment		Yes						No
Social influence (conformity, compliance an obedience)						Yes	Yes	Yes
Facilitating conditions (infrastructure)							Yes	Yes
Attitude	Yes	Yes	Yes	Yes			Yes	No
Efficiency/ performance						Yes		No
Personal(relative advantage, compatibility, complexity, trialability, observability**)**		Yes	Yes		Yes	Yes	Yes	No
Demographic(age, gender, education and technological advancement**)**	Yes						Yes	No

Table 9: Factors affecting adoption for Havana youth

The reasoning for inclusion or exclusion of the factors into the final model are explained below

- **Perceived ease of use**: Considering the diversity of the users' skills and background, we cannot attest to any correlation in terms of perceived ease of use of the system. Moreover, most youth struggled with basic concept used in the system from a content as well as functionality perspective. Thus, it is safe to conclude that despite the fact that most youth did not perceive the system easy to use, they did use it and therefore the perceived ease of use is not an influential factor.
- **Perceived usefulness**: Considering that most of the youth did not understood the concept of crowdfunding they could possibly not have made a judgement of the usefulness of the system. Only in one of the recent sessions did they start to internalise the idea and the possibilities of crowdfunding long after they have used the platform. Thus perceived usefulness is not and influential factor to use the system.
- **Behavioural intention**: At no point did we record a formulated intent by the youth to use the system. While many of the youth were engaged in the idea of creating a social enterprise, none did intent to use the system. Also considering that they did not understand what the platform would contribute to their enterprise, therefore it was just considered a component of the training workshop to fill in that form.
- **Entertainment:** During the mobile services exploration stage, we observed the youth's attraction to the game app over the learning apps. However, in the discussion and voting process of which app to introduce the youth decided for the learning app. Moreover, conscious of the electricity consumption and charging challenges, the youth stated they could not afford to play games.
- **The Social influence:** Throughout, we observed how the ambassadors influence other youth. We have seen how a single person managed to invite a group of other youth that signed up as ambassadors or for training, most likely not knowing what to expect. Besides the trust in their friend, influences of authority can be observed such as community leaders, pastors etc. Thus, once the ambassadors were formally recognised and identified through an official nametag with NUST logo their radius of influence expanded beyond their immediate friends. Conformity, being one of the factors influencing behaviour mostly in collective cultures, such as the

Namibian ones, played an important factor. After a number of youth ambassadors did have their projects uploaded on the system visible to the outside world did new users join. Thus, we consider social influence as one of the most important factors to technology adoption.

- **Infrastructure:** The fact remains that the Havana community does not have a widespread technological infrastructure. Although the number of mobile phone users is high, the usage of internet is extremely low. Many only have low-end phones, which does not permit them to make use of web-services or apps. Thus, we consider infrastructure as one of the enabler factors.
- **Attitude:** Our analysis from the point the youth were introduced to the crowdfunding system revealed that they did not have an idea of what system is all about. Hence, their attitude towards system did not have an influence from towards system usage from that point, as they did not know the effect of the system usage. Therefore, we consider the attitude not to influence the youth to use the system.
- **Efficiency/performance:** Considering that the youth did not know how the platform will benefit them in the first place, we postulate that under no circumstance they thought that starting using system will assist in the smooth performance of their enterprises (should they get funding). Thus, we do not consider the efficiency/performance to be a factor in this instance.
- **Demographics:** Looking at the diversity of the participants we did not record any variances with dependencies on age, gender, language, etc. Especially within a collective that does not distinguish those factors in their general approach to help community members.

A factor, which was not explicitly named in previous technology adoption models, is **Capability**. We have spent unplanned substantial time on training which leads us to the conclusion that building capability is an essential factor to ensure technology use. Thus, future users do not only need to have the technical skills but also the content knowledge.

5.2 Rethinking underpinning theories

Most mainstream technology adoption models are based on the theory of reasoned action, whereby, a person is assumed to have an attitude towards technology, build a behaviour intent out of which the behaviour of using the technology emerges. However, based on our empirical data we cannot confirm

prior attitude or a pre-formulated intent of usage of a certain technology by the Havana youth. In the contrary, the youth first used the system before they realised the purpose and could form an attitude. With this observation, we reconsidered the underlying theories of technology adoption. Bandura (1999) introduces the social cognitive theory where he explains human functioning by the use of a triadic interaction of behaviour, personal and environmental factors. The environmental factors comprise situational influences and where such influence is performed whereas personal factors deliberate on instincts, drives, traits, and other forces motivating an individual (Bandura, 1999).

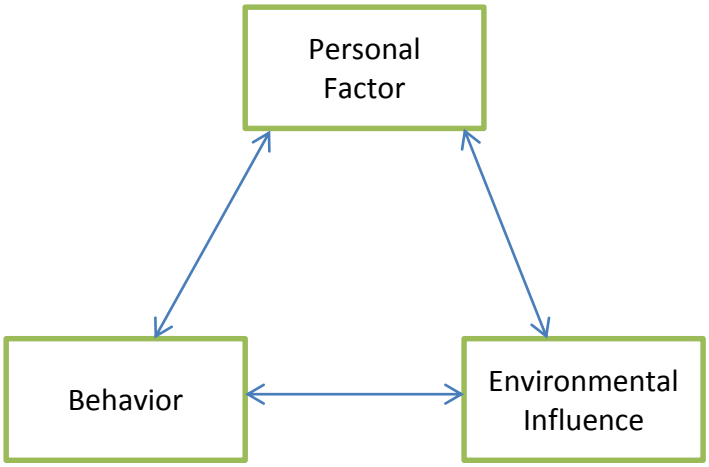


Figure 39: Social cognitive theory adopted from Bandura (1986)

Thus considering social influences to be external environmental factors then the theory aligns with our empirical data whereby ambassadors/friends influence people into attending workshops, registering on the system and up using the system without having a pre-formulated opinion or attitude. The personal disposition of a youth in Havana is assumed to be open to actions as suggested by their friends.

5.3 An appropriate technology adoption model

Having contextually and theoretically analysed factors that affects adoption for the youth living in an informal settlement in Namibia, we derive a new model, which we consider adequate for the local context and similar settings. The model we are proposing versus the prevailing models comprises two of the originally considered factors, namely the social influence and the infrastructure, the latter being comprised in the enablers. Furthermore, based on the social cognitive theory we consider the elements of environment (social influence and enablers), the self (capability) and the technology use (behaviour). The diagram below shows the proposed technology adoption model.

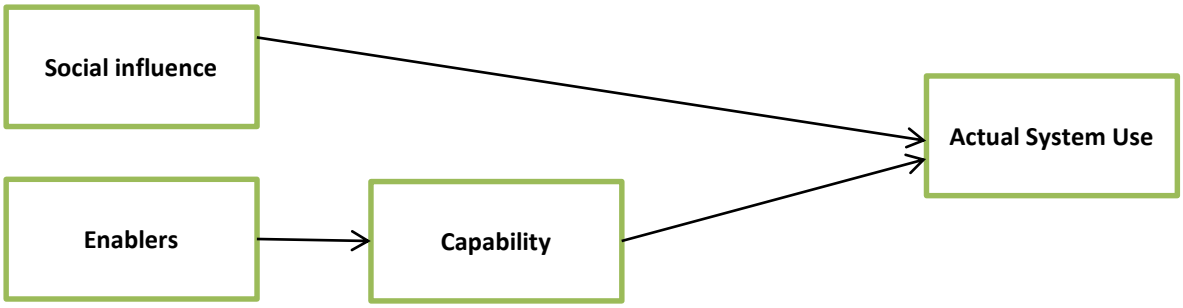


Figure 40: proposed adoption model

We argue that social influence is the most important factor to mobilise people to action, in this case use the system. However, at the same time a set of Enablers need to be in place in order to assure people are actually capable of using the system. In the Havana context this means the infrastructure must be given considering that the individuals do not have sufficient access to technologies and secondly training needs to be provided ensuring the individuals have sufficient skills and understanding.

In the following, we provide a step-by-step guideline to deploy a new technology or digital service in an informal settlement or similar setting.

1. Identify entry points – could be a person or group of people that will suggest the right people to work with in the community (social influencer)
2. Mobilise a set of close followers to the social influencer
3. Convert the followers into ambassadors
    a. It is recommended that the ambassadors get a formal recognition. This will help the ambassadors to be easily recognised in the community and it will show they are associated with an external entity / brand.
        i. Name tags (identification)
        ii. T-shirts with the content of the system to be deployed
        iii. Position within community
    b. Train the ambassadors on how the system works **(capability creation)**
    c. Ensure the ambassadors become users of the system **(actual system use)**
    d. Assign the ambassadors the roles of recruiters. Only after the ambassadors have become actual users of the system they should be able to take people by the hand and introduce them to the system use.

4. Support Ambassadors activities. The support of ambassadors need to be in place in case if they are having difficulties and they need any time of support the actual implementers will be able to give until a suitable exit point is reached, which could be months or longer depending on the system.
5. Exit strategy: the exit strategy is a point that the system owners or implementers need to detach themselves from the community. Hence, at this stage, the ambassadors might be heavily attached to the owners and an exit strategy will be required on how the community members will continue, be independent and carry out the activities by themselves.

CHAPTER SIX

6. CONCLUSION

6.1 Summary

In the first chapter, we pronounced the aims for developing an appropriate adoption model for the unemployed youth living in an informal settlement in Namibia. The development process has evaluated renowned technology adoption models for their suitability in our setting. Acknowledging that every deployment context is different, the study has realised how different factors come to play when the marginalised youth need to adopt a technology. In the first instance, we needed to establish Havana's current context of digital service usage and technology adoption as well as to unveil significant factors for future technology adoption. Using triangulation between questionnaires, focus groups and experimental technology setup, it provided us with an aggregate of necessary data. While the questionnaires provided only incomplete information on services and technology use and adoption, the focus group supplied for information that is more detailed. Overall, it was established that the youth is not aware of many services provided.

The process of developing the adoption model was influenced by the results gathered throughout the research project. Consequently, the development of the technology adoption model was iterative, grounded within the context yet aligned with theories, which were however treated with care and premeditated to advance the research in the right direction.

We have co-designed, tested, and validated our strategy with a selected group of youth in Havana, based on an exemplary collaboration with youth ambassadors whose tasks were to propagate information and recruit new system users in their community. We have discovered that the original lack of understanding of the principle of the system being deployed has a direct impact on the ambassadors influencing others. Hence, there is serious need to build capability among the ambassadors first. The ambassadors need to receive adequate training to be able to use the system and to understand it better. Our model also emphasises on the act of having a formal recognition of the ambassadors. The community members seem to trust them if they are associated to a known institution and when having

formal identification. This act gave the ambassadors a sense of belonging and the trust from the community members.

The applicability of the ambassadors' concept did not materialise in the first round. We observed a lack of commitment from the ambassadors, as they did not understand the roles they had to play in the adoption process. The ambassadors also did not quite understand the system being deployed. The application of the commitment workshop really aided the ambassadors and the researcher to streamline project goals and individual contributions and tasks to be completed. The additional approach of recognition and rewards for ambassadors added another dimension to the adoption process.

The conceptualisation of the appropriate proposed model has shown how most of the factors signified by existing models do not apply. We have recognised that social influence and infrastructure plays an important role in the informal settlement community. The new users of a system are highly influenced by existing ones, but not necessarily by the act of changing attitudes first before performing behaviour. Thus, the questioning of established adoption models based on empirical data shows the need to ground processes within the context and to rely on appropriate theories. In the context of informal settlements in Southern Africa we postulate that the social cognitive theory is more applicable then the reasoned action theory. Thus, a different technology adoption model was derived.

6.2 Future work

This study established a novel adoption model suitable for an informal settlement based on empirical data correlated with an existing theory. Thus, in future work the model should be validated in similar settings and refined further. At a later stage, the model could be applied in a broader context to establish the scope of validity.

REFERENCES

Abbasi, S., & Manawar, M. (2011, June 22). Multi-dimensional Challenges Facing Digital Youth and their Consequence. *Second Worldwide Cybersecurity Summit (WCS)* (pp. 1 - 5). IEEE. Retrieved from IEEE Xplore Digital Library: http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=5978784

AfricanAdvice. (2017, November 18). *Lida Cleaning Services*. Retrieved from AfricanAdvice: https://www.africanadvice.com/1313257/Dry_Cleaning/Namibia/Lida_Cleaning_Services/

Ajzen, I. (1991). The Theory of Planned Behavior. *Organisational Behaviour and Human Decision Processes*, 179-211.

Aker, J. C., & Mbiti, I. M. (2010). *Mobile phones and economic development in Africa.* Washngton DC: Center for Global Development. Retrieved from www.cgdev.org

Aldhaban, F. (2012). Exploring the Adoption of Smartphone Technology: Literature Review. *2012 Proceedings of PICMET '12: Technology Management for Emerging Technologies* (pp. 2758-2770). Portland: IEEE.

Averweg, U. R. (2008). Information Technology Acceptance in SouthAfrica: An Investigation of Perceived Usefulness,Perceived Ease of Use, and Actual System UseConstructs. *The African Journal of Information Systems*.

Bandura, A. (1977). Self-Efficacy: Toward a Unified Theory of Behavioural change. *Pyschological Review, 84*(2), 191-215.

Bandura, A. (1989). Social Cognitive Theory. *Annals of child development*, 1-60.

Bandura, A. (1999). Social cogitive theory of personality. In L. Pervin, & O. John, *Handbook of personality* (2nd ed ed., pp. 154-196). New York: Guilford Press.

Bergamini, T. P., Navarro, C. L.-C., & Hilliard, I. (2017). Is Crowdfunding an approporiate finnancial model for social entreprenuresip. *Academy of Entrepreneurship Journal, 23*(1), 44-57.

Biavaschi, C., Eichhorst, W., Giulietti, C., Kendzia, M. J., Muravyev, A., Pieters, J., . . . Zimmermann, K. F. (2012). *Youth Unemployment and Vocational Training.* Bonn, Gemany: Institute for the Study of labour.

Biljon, J. v., & Kotzé, P. (2007). Modelling the Factors that Influence Mobile Phone Adoption. *SAICSIT '07* (pp. 152-161). Port Elizabeth: ACM.

Bjoern, N., Elena, G., & Ralf, P. (2012). Social Aspects in Technology Acceptance: Theory Integration and Development. *2012 45th Hawaii International Conference on System Sciences* (pp. 3149-3158). Hawaii: IEEE. doi:10.1109

Bornstein, D., & Davis, S. (2010). *Social Entreprenureship: what everyone needs to know.* New York: Oxford University Press, Inc.

Botha, N., & Atkins, K. (2005). An assessment of five different theoretical frameworks to study the uptake of innovations. *2005 NZARES Conference.* Hamilton: NZARES.

Boum, E. (2015, November 12). *Crowdfunding in africa: Fundrising goes digital in Africa: tje Emergence of Africa-Based Crowdfunding Platforms.* Afrikstart. Retrieved from Afrikstart: https://afrikstart.com/report/

Burn, V. (2014, May 30). */rlabs-youth-tech*. Retrieved from Money Spent Well: http://moneyspentwell.org/2014/05/rlabs-youth-tech/

Cabrero, D. G., Winschiers-Theophilus, H., & Mendonca, H. (2015). User-Created Personas – A Micro-cultural Lens into Informal Settlement's Youth Life. 57–70. doi:10.1007/978-3-319-27048-7

Campbell, M. A. (2005). The impact of the mobile phone on young people's social life. *Social Change in the 21st Century Conference.* Brisbane: QUT Carseldine.

Carroll, J., Howard, S., Vetere, F., Peck, J., & Murphy, J. (2002). Just what do the youth of today want? *35th Hawaii International Conference on System Sciences.* Hawaii: IEEE.

Chigon, W., & Licker, P. (2008). Using Diffusion of Innovations Framework to Explain Communal Computing Facilities Adoption Among the Urban Poor. *Information Technologies and International Development*, 57-73.

Davis, F. D. (1986). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems.* Massachusetts : Massachusetts Institute of Technology.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology*, 1111–1132.

Davis, J. (2004). Writing an actioResearch thesis: One researcher's resolution of the problematic of form and process,. In E. McWilliam, S. Danby, & J. Knight, *Performing Educational Research: Theories, Methods and Practices, chapter 2,* (pp. 15-30). Flaxton, Queensland: Post Pressed.

Digital Services Advisory Group. (2012). *Digital Governament* . Retrieved from Whitehuse: https://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html

Donner, J. (2008). Research Approaches to Mobile Use in the Developing World: A Review of the Literature. *The Information Society, 24*(3), 40-159. doi:10.1080/01972240802019970

Donner, J., & Tellez, C. A. (2008). Mobile banking and economic development: Linking adoption, impact, and use. *Asian Journal of Communication, 18*(4), 318-332. doi:10.1080/01292980802344190

EDA. (2016, September 9). *EquippedEntertainment/about*. Retrieved from Facebook: https://www.facebook.com/EquippedEntertainment/about/?entry_point=page_nav_about_item&tab=page_info

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading.* Massachusetts: Addison-Wesley.

FNBNamibia. (2016, October 17). *ewallet*. Retrieved from www.fnbnamibia.com: https://www.fnbnamibia.com.na/electronic-services/ewallet.html

Funzilife Inc. (2017). *about*. Retrieved March 18, 2017, from https://funzi.mobi/about

Fuzu ltd. (2016, July 11). *Home*. Retrieved March 16, 2017, from Fuzu: https://www.fuzu.com

Gelderblom, H., van Dyk, T., & Biljon, v. J. (2010). Mobile phone adoption: Do existing models adequatelycapture the actual usage of older adults? *SAICSIT '10* (pp. 67-74). Bela Bela: ACM. doi:10.1145/1899503.1899511

Goagoses, N. (2016). Wishful patchwork: mental contrasting for a common goal. *14th Participatory Design Conference. 2*, pp. 63-64. Aarhus: ACM. doi:10.1145/2948076.2955117

Graham, S. (2002). Bridging Urban Digital Divides: UrbanPolarisation and Information and CommunicationsTechnologies (ICTs). *Urban Studies, 39*(1), 33 – 56.

Hall, B. H., & Khan, B. (2003, November 16). Adoption of New Technology. In J. Derek C, *New Economy Handbook.* San Diego: Academic Press. doi:10.3386/w9730

Hayes, G. R. (2011). The relationship of Action Reseatch to Human-Computer Interaction. *ACM, 18*(3). doi:10.1145/1993060.1993065

Heeks, R. (2009). *The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development?* Manchester: Development Informatics Group.

Hourcade, J. P., Bullock-Rest, N. E., & Schelhowe, H. (2010). Digital Technologies and Marginalized Youth. *IDC 2010,* (pp. 360-363). Barcelona: ACM.

ILO. (2012). *Africa's Response to the Youth Employment Crisis Regional Report.* Geneva: International Labour Organization.

ILO. (2012). *Youth Employment Interventions in Africa.* Geneva: International Labour Organization.

ILO. (2016). *Young and female - a double strike? gender analysis of school-to-work transition surveys in 32 developing economies.* Geneva: International Labour Organization.

In Merriam-Webster's dictionary. (2017, November 15). *Dictionary*. Retrieved from Merriam-Webster's dictionary: https://www.merriam-webster.com/dictionary/atheoretical

Indongo, N., Angombe, S., & Nickanor, N. (2013). *URBANISATION IN NAMIBIA.* Windhoek: University of Namibia.

IUM. (2017, November 18). *Home*. Retrieved from International University of Management: http://www.ium.edu.na/

Kambunga, A. P. (2014). *The impact of Internet literacy training for the unemployed youth: a case study of Rlabs Namibia.* Windhoek.

Kanyenze, G., & Lapeyre, F. (2012). *Growth, employment and decent work in Namibia: A situation analysis.* Geneva: International Labour Office.

Kayec. (2016, September 9). *skills training*. Retrieved from Kayec: http://kayec.org/category/skills-training/

Keskinen, P. (2016). *Supporting emerging entrepreneurship in informal settlements with digital services.* Helsinki: Aalto university. Retrieved from http://urn.fi/URN:NBN:fi:aalto-201610124941

Koch, C. (2017, November 4). *Social Cognition and Social Learning Theories of Education and Technology*. Retrieved from EdTech: https://sites.google.com/a/boisestate.edu/edtechtheories/social-cognition-and-social-learning-theories-of-education-and-technology

Kuppuswamy, V., & Bayus, B. L. (2017, November 5). *SSRN.* Retrieved from sol3: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2234765

Lai, P. (2017). The literature review of technology adoption models and theories for the novelty technology. *JISTEM, 14*(1), 21-38. doi:10.4301/S1807-17752017000100002

Lesitaokana, W. O. (2014). *"It's My Mobile": Adoption, Consumption and Meanings of the Mobile Phone Among Urban Youth in Botswana - An Ethnographic Study.* Brisbane: Griffith University.

Li, L. (2010). A Critical Review of Technology Acceptance Literature. *Southwest Decision Sciences Institute Conference.* Dallas: Southwest Decision Sciences Institute Conference.

Lorini, M. R., Van Zyl, I., & Chigona, W. (2014). ICTs for Inclusive Communities: A Critical Discourse Analysis. *IDIA 2014* (pp. 78-94). Port Elizabeth: IDIA. Retrieved from

http://www.developmentinformatics.org/conferences/2014/papers/7-Lorini-VanZyl-Chigona.pdf

Lungameni, A. N. (2016). *Web-Based Crowdfunding Module For Unemployed Havana Youth Initiated Projects Using Paticipatory Service Design.* Windhoek: NUST.

Madden, M., Lenhart, A., Duggan, M., Cortesi, S., & Gasser, U. (2013). *Teens and Technology 2013.* Washngton D.C: Pew REsearch Centre.

Magloff, L. (2017). *A Commission-Based Salary*. Retrieved July 30, 2017, from http://smallbusiness.chron.com/commissionbased-salary-11999.html

ManpowerGroup. (2012, May 1). *How policymakers can boost youth employment.* Milwaukee: ManpowerGroup. Retrieved April 15, 2016, from Research: http://hdl.voced.edu.au/10707/305560

Ministry of Youth . (2016, September 9). *youth*. Retrieved from Ministry of Sport, youth and National Services: http://www.msyns.gov.na/youth

Ministry of Youth. (2017, November 12). *Ministry of Sport, Youth, and National Service*. Retrieved from Youth: http://www.msyns.gov.na/youth

Muiya, B. M. (2014). The nature, challenges and consequences of urban youth unemployment: A case of Nairobi city, Kenya. *Universal Journal of Educational Research*, 495-503.

Muller, M. J., & Kuhn, S. (1993). Participatory design. *ACM, 36*(6), 24-28. doi:10.1145/153571.255960

Mwanyekange, E. P. (2014). *An exploratory study of the role of the shack dwellers federation of Namibia's (sdfn) saving schemes in housing development: a case study of Havana and Okahandja park informal settlements in Windhoek.* Windhoek: University of Namibia.

NAMCOL. (2016, September 9). *about us*. Retrieved from Namibia College of Open Learning: http://www.namcol.edu.na/about-us/1/

NAMCOL. (2016, September 9). *About us*. Retrieved from Namibia college of Open Learning: http://www.namcol.edu.na/about-us/1/

Namibia Statistics Agency. (2011). *Namibia 2011 Population & housing census main report.* Windhoek: Namibia Statistics Agency.

Namibia Statistics Agency. (2015). *Namibia Labour Force Survey 2014 Report.* Windhoek: Namibia Statistics Agency.

Namibia Statistics Agency. (2016). *The Namibia Labour Force Survey 2016 Report.* Windhoek: Namibia Statistics Agency.

NYC. (20126, September 9). *About us*. Retrieved from National Youth Council of Namibia: http://www.youthcouncil-namibia.org/about.htm

NYS. (2016, September 9). *About NYS*. Retrieved from National Youth Council: http://www.nys.com.na/index.php?option=com_content&view=article&id=19&Itemid=53

Office of the President. (2016). *Harambee Prosperity Plan.* Windhoek: Office of the President.

Office of the Prime Minister. (2014). *e-Government Strategic Action Plan for the public service of Namibia2014-2018.* Windhoek: Office of the Prime Minister.

Olushola, T., & Abiola, J. O. (2017). The Efficacy of Technology Acceptance Model: A Review of Applicable Theoretical Models in Information Technology Researches. *Journal of Research in Business and Management, 4*(11), 70-83.

Ombetja Yehinga Organisation. (2016). *about*. Retrieved September 2, 2016, from www.ombetja.org/about

Ongwere, T. (2015). *Self-actualization of unemployed youth through participatory service design.* Windhoek.

Oppenheimer, J., Spicer, M., Alberto, T., Paul, Z., Jessica, B., Domingo, C., . . . Benjamin, L. (2011). *Putting Young Africans to Work.* Johannesburg: The Brenthurst Foundation, E Oppenheimer & Son (Pty) Ltd.

Oxford University Press. (2017, August 1). *Oxford dictionary* . Retrieved from Oxford dictionary : https://en.oxforddictionaries.com/definition/us/crowdfunding

OYO. (2016, September 9). *about*. Retrieved from Ombetja Yehinga Organisation: http://www.ombetja.org/about/

Ozanne, J. L., & Saatcioglu, B. (2008). Participatory Action Research. *Journal of Consumer Research*, 423-439.

Parker, M., Wills, J., & Wills, G. B. (2012). RLabs:A South African perspective on a community-driven approach to community information. *Journal of Community Informatics, 9*(3), 1-14.

Peace Child International. (2015, September 9). *Peace Child International*. Retrieved April 15, 2016, from Peace Child International: http://peacechild.org/youth-unemployment-causes-and-solutions/

Popplewell, R., & Hayman, R. (2012). *Where, how, and why are Action Research approaches used by.* International NGO Taining and Research Centre.

Popplewell, R., & Hayman, R. (2012). *Where, how, and why are Action Research approaches used by international development non-governmental organisations?* England: International NGO Taining and Research Centre.

Porter, G., Hampshire, K., Abane, A., Munthali, A., Robson, E., Mashiri, M., & Tanle, A. (2012). Youth, mobility and mobile phones in Africa: findings from a three-country study. *Information Technology for Development, 18*(2), 45-162. doi:10.1080/02681102.2011.643210

Rangaswamy, N., & Cutrell, E. (2012). Anthropology, development and ICTs: slums, youth and the mobile Internet in urban India. *ACM*, 85-93.

Reiser, D. B., & Dean, S. A. (2015). SE(c)(3): Catalyst for Social Enterprise Crowdfunding. *Indianna Law Journal, 90*(3), 1091-1130.

RLabs. (2017, May 5). *about-us*. Retrieved from RLabs Namibia: https://www.rlabsnamibia.org/about-us/

RLabs Namibia . (2017, November 21). *About us*. Retrieved from Namstarter: http://namstarter.rlabsnamibia.org/about-us

RLabs Namibia. (2016, April 27). *job-matching*. Retrieved April 27, 2016, from RLabs Namibia: http://rlabsnamibia.org/job-matching.html

Rlabs Namibia. (2017, 11 10). *Home*. Retrieved from NamStarter: http://namstarter.rlabsnamibia.org/

RLabs Namibia. (2017, November 2). *RLabs Training Courses*. Retrieved May 30, 2017, from Rabs Namibia: https://rlabsnamibia.org/training

Rogers, E. (2003). *Diffusion of Innovations 5th Ed.* New York: The Free Press.

Rossing Foundation. (2017, November 18). *Mandate*. Retrieved from The Rossing Foundation: http://www.rossingfoundation.com/mandate.htm

Rovio Entertainment Corporation. (2017, November 24). *Home*. Retrieved from Angry Birds: https://www.angrybirds.com/

Roy Rosenzweig Center for History and New Media. (2017, November 17). *Home*. Retrieved from Zotero: https://www.zotero.org/

Sambasivan, N., Cutrell, E., Toyama, K., & Nardi, B. (2010). Intermediated Technology Use in Developing Communities. *CHI 2010: HCI and the Developing World.* Atlanta: ACM.

Sambasivan, N., Rangaswamy, N., Cutrell, E., & Nardi, B. (2009). UbiComp4D: infrastructure and interaction for international development—the case of urban Indian slums. *ACM*.

Samuel, M., Taylor, J., Winschiers-Theophilus, H., & Nieminen, M. (2017). Improving the flow of livelihood information among unemployed youth in an informal settlement of Windhoek, Namibia. *C&T '17.* Troyes: Association for Computing Machinery.

Scialdone, M. J., & Zhang, P. (2010). Deconstructing Motivations of ICT Adoption and Use: A Theoretical Model and its Application to Social ICT. *iConference 2010* (p. 212). Allinois: iConference.

Shack Dwellers . (2017, November 18). *Namibia Housing Action Group*. Retrieved from Shack Dwellers : http://namibia-shackdwellers.blogspot.com/2012/03/nhag.html

Shack Dwellers Federation of Namibia. (2009). *Community Land Information Program (Clip) Profile Of Informal Settlements In Namibia.* Windhoek: Namibia Housing Action Group.

Shack Dwellers Federation of Namibia. (2017, November 18). *SDFN*. Retrieved from Shack Dwellers Federation of Namibia: http://namibia-shackdwellers.blogspot.com/p/shack-dwellers-federation-of-namibia_16.html

Sharma, R., & Mishra, R. (2014). A Review of Evolution of Theories and Models of Technology Adoption. *Search Results, 6*(2), 17-29.

Siddaway, A. (2016, 10 16). *What is a Systematic Literature Review and How do I do one?* Retrieved from Cyber Manuals: http://www.cybermanual.com/what-is-a-systematic-literature-review-and-how-do-i-do-one.html?page=12

Sommers, M. (2010). Urban youth in Africa. *International Institute for Environment and Development (IIED), 22*(2), 317–332. doi:10.1177/0956247810377964

SPYL. (2016, September 9). *Home*. Retrieved from SWAPO Party Youth League Online: http://www.spyl.com.na/

Srinivas, H. (2016, June 3). *Defining Squatter Settlements*. Retrieved from The Global Development Research Centre: http://www.gdrc.org/uem/define-squatter.html

Sterinberg, S., & DeMaria, R. (2012). *The Crowdfunding Bible.* read.me.

Steyn, J., Rampa, M., & Marain, M. (2013). Participatory Development of ICT Entrepreneurship in an Informal Settlement in South Africa. *The Journal of Community Informatics, 9*(4).

Susman, G. I. (1983). *Action REsearch: A Sociotechnical systems Perrrrrspective.* London: Sage Publications.

Swart, R., & Milner, M. E. (2015, November 05). *Crowdfunding a roadmap for Global Solution Networks.* Retrieved from Global Solution Networks: http://gsnetworks.org/research_posts/crowdfunding/

Swart, R., & Milner, M. E. (2015). *Crowdfunding A roadmap for global solution networks.* Berkeley: Global Solution Neworks.

The World Bank Group. (2015). *Crowdfunding in Emerging Markets:Lessons from East African Startups.* Washington DC: The World Bank Group.

Thowfeek, M. H., & Jaafar, A. (2010). Integrating National Culture into Information and Communication Technology Adoption Model. *IEEE*, 1601-1605.

Tjikune, C. B. (2007). *Socio-Economic Factors Impacting Youth Unemployment in Namibia.* Windhoek: University of Namibia Library.

Tonny, W. (2013). *Youth unemployment: REview of the training for young people with low qulifications.* London: Department of Innovation and Skills.

Trafimow, D. (2009). The Theory of Reasoned Action A Case Study of Falsification in Psychology. *Theory & Pychology, 19*(4), 501–518.

Uddin, P. S., & Osemengbe, 2. O. (2013). Causes, effects and solutions to youth unemployment. *Emerging Trends in Economics and Management Sciences, 4*(4), 397-402.

United Nations. (2015). 22 – Informal Settlements. *United Nations Conference on Housing and Sustainabile Urban Development.* New York: Habitat III.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *Ms Quatery*, 425-473.

Viswanath Venkatesh, F. D. (1996). A model of the Antecedents of Perceived Ease of Use: Development and Test. *Decision Science, 27*(3), 451-481.

Waterman, A. (2004). *Diffusion of Innovations*. Retrieved from Diffusion of Innovations: www.stanford.edu/class/symbsys205/Commentary-RogersDiffusionInnovations.html

Weinberg, B. A. (2004). *Experience and Technology Adoption.* Ohio: The Institute for the Study of Labor. Retrieved from https://ssrn.com/abstract=522302

Wheat, R., YiweiWang, & E.Byrnes, J. (2013). Raising money for scientific research through crowdfunding;Jai Ranganathan. *Elsevier, 28*(2), 71-72. doi:https://doi.org/10.1016/j.tree.2012.11.001

Winschiers-Theophilus, H., Daniel G, C., Chivuno-Kuria, S., Mendonca, H., Shetuyene S, A., & Onwordi, L. (2017). Promoting Entrepreneurship amid Youth in Windhoek's Informal Settlements:A Namibian Case. *Science, Technology & Society*, 350–366. doi:10.1177/0971721817702294

Winschiers-Theophilus, H., Keskinen, P., Cabrero, D., Chivuno-Kuria, S., Ongwere, T., Angula, S., & Ngolo, R. (2015). *ICTD within the Discourse of Locally Situated Interaction: The Potential of Youth Engagement.* Zanzibar: IDIA.

Woelfer, J. P., & Hendry, D. G. (2010). Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Center. *CHI 2010* (pp. 1291-1300). Atlanta: ACM. doi:10.1145/1753326.1753520

Word Bank. (n.d.). *Theories of behaviour change.* Washington DC,: Word Bank.

WVTC. (2017, November 18). *Home*. Retrieved from Windhoek Vocational Training Centre: http://www.wvtc.edu.na/

Wyche, S. (2015). Exploring mobile phone and social media use in a Nairobi slum: a case for alternative approaches to design in ICTD. *ICTD '15* (pp. 12:1–12:8). New York: ACM.

Wyche, S. P., Forte, A., & Schoenebeck, S. Y. (2013). Hustling Online: Understanding Consolidated Facebook Use in an Informal Settlement in Nairobi. *CHI 2013* (pp. 2823–2832). New York: ACM.

Yannascoli, S. M., Schenker, M. L., Carey, J. L., Ahn, J., & Baldwin, K. D. (2013). How to write a systematic review: a step-by-step guide. *University of Pennsylvania Orthopaecic journal*, 64-69.

Zaremohzzabieh, Z., Samah, B. a., Muhammad, M., Omar, S. Z., Bolong, J., Hassan, M. S., & Shaffril, H. A. (2015). A Test of the Technology Acceptance Model for Understanding the ICT Adoption Behavior of Rural Young Entrepreneurs. *International Journal of Business and Management, 10*(3), 158-169. doi:10.5539/ijbm.v10n2p158

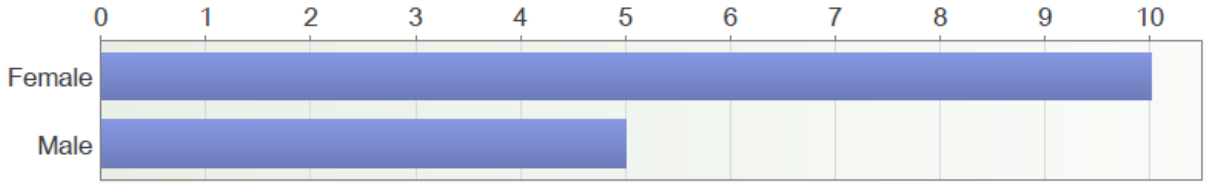
APPENDIXES

1. Questionnaire: Diagnosis

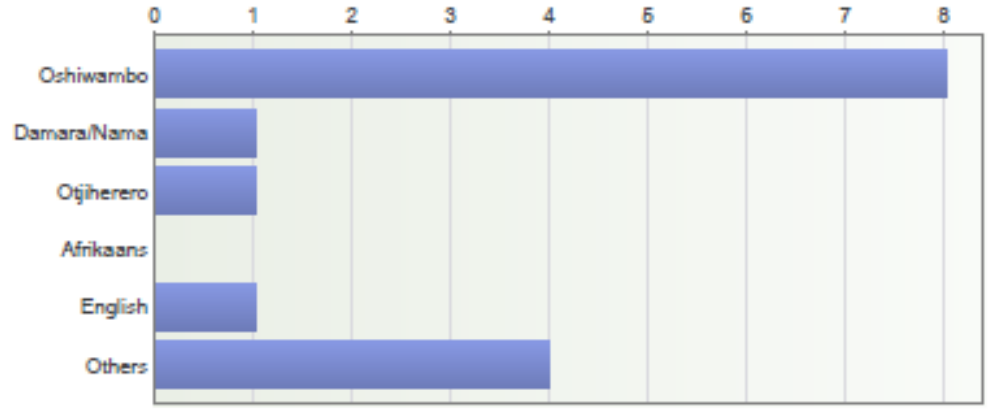
Havana

1. What is your gender?

Number of respondents: 15



2. What language do you speak most often?



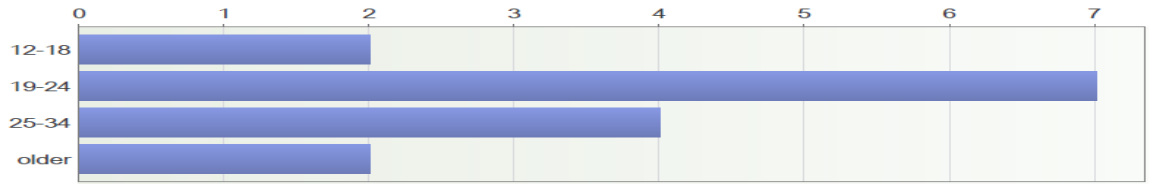
Number of respondents: 15

Open text answers: Others

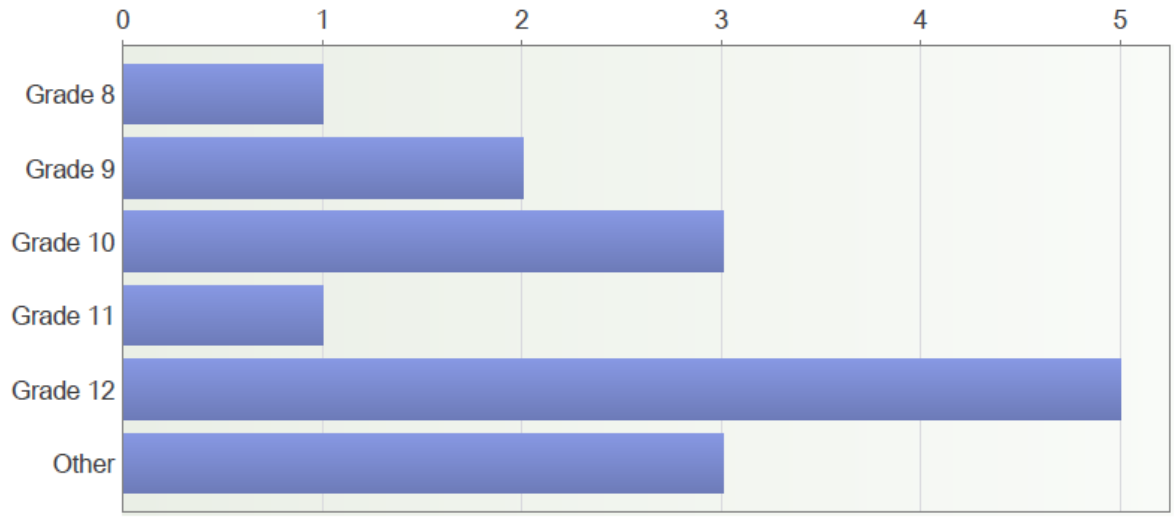
- Oshiwambo and english
- oshiwambo, afrikaans, english
- Oshiwambo,otjihereo,afrikaans,english
- Oshiwambo, english

3. What is your age?

Number of respondents: 15



4. What is your highest grade completed?



Number of respondents: 15

Open text answers: Other

- business management, entrepreneurship, computer and security management
- 6
- Grade 10, Namcol

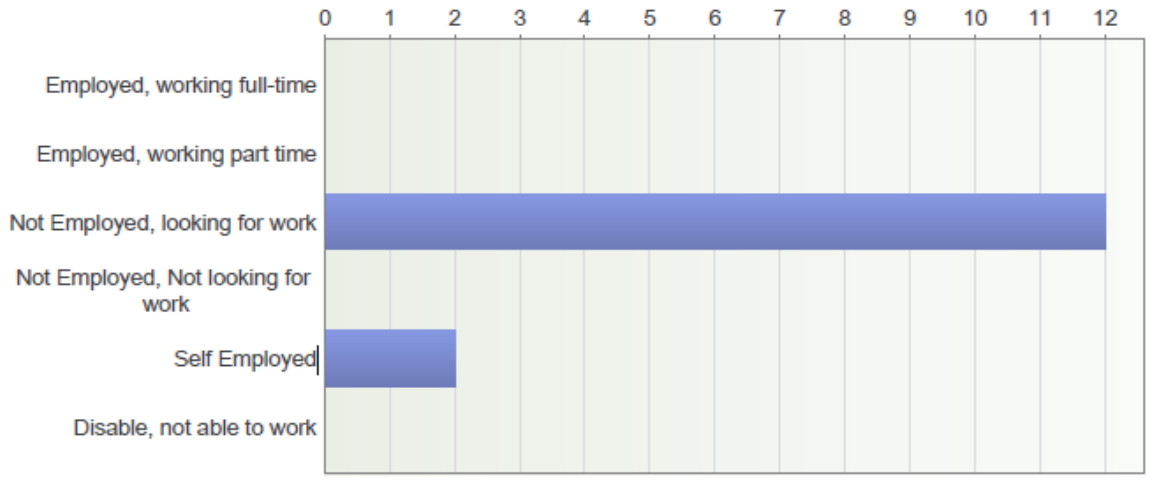
5. If you left school before grade 12, what are the reasons?

Number of respondents: 9

Reason	Reason	Reason	Reason
Failed grade 10			
Apartheid	School is far	Parents unemployed	
I stated leaving in Havana t take care of house			
I failed grade 10			
Parents could not afford to pay school fees			
Completed grade 12			
Fail grade 10			
My mother suferred for us alone	money problems		
The problem is the school fees			

6. Which of the following categories best describe your employment status?

Number of respondents: 14



7. How long have you been in your position?

Number of respondents: 10

Year

- 3
- 2 years

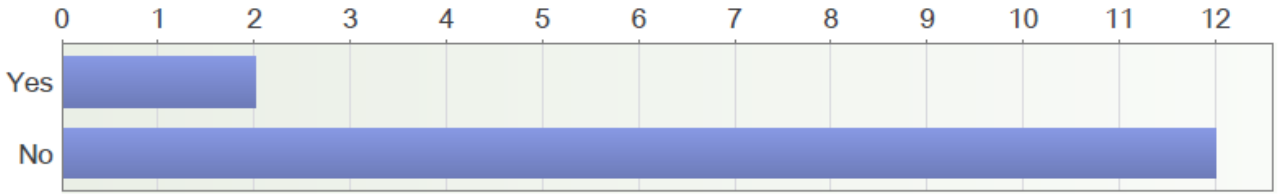
- 2
- 2016
- 20
- 2
- 20
- 2016
- 3 years

Months

- 4
- 24
- jan
- Jan to December
- Jan
- 6

8. Do you have your own business

Number of respondents: 14



9. Do you think technology will help make your business successful?

Number of respondents: 13

10. Are your currently studying or have you thought of going to study?

Number of respondents: 10

I am studying

- Yes
- English
- 9 subjects
- N/A
- At college of the arts

I thought of studying at

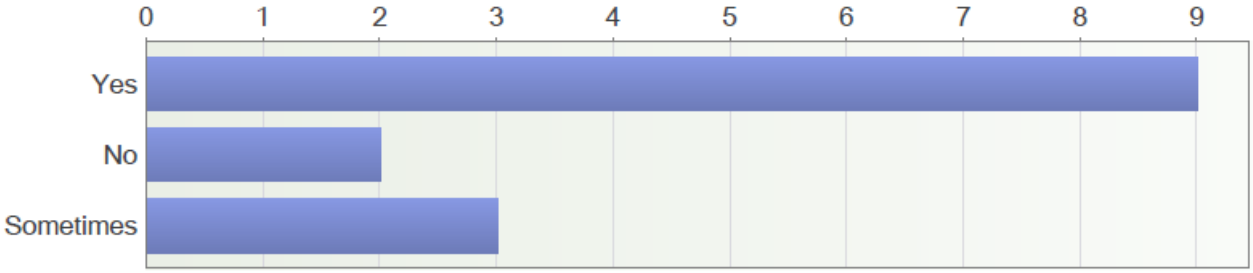
- Namcol
- Triamphat college
- Institution
- Contents of
- kayec
- A.S.S.S
- No
- UNAM
- Nancol

The subject

- Accounting
- Construction engineering
- IT
- At University
- welding and metal fabrication
- No
- Chemistry
- Exo, math, business s

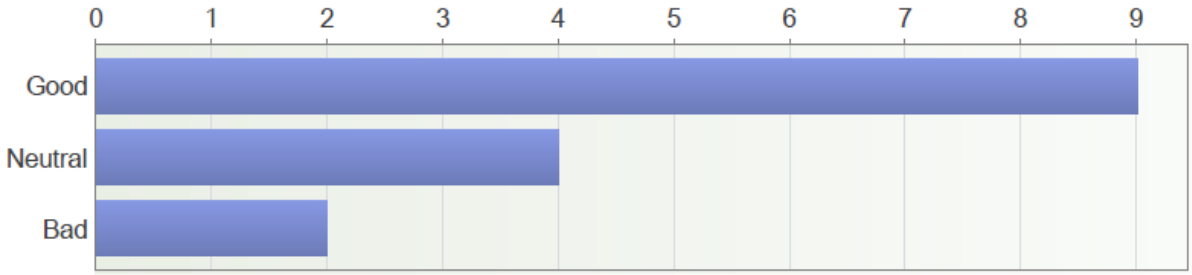
11. Do you have access to mobile phone?

Number of respondents: 14



12. How good is the mobile coverage in Havana

Number of respondents: 15



13. Apart from messaging and calling, what else do you use your mobile phone for?

Number of respondents: 12

1

- WhatsApp
- Internet
- Email
- Internet
- internet
- whatsapp
- facebook
- N/A
- whatsapp
- Whatsapp
- Check my emails
- Searching work on internet

2

- Facebook
- WhatsApp

- googling
- google chat
- twitter
- N/A
- Facebook
- Instagram
- Taking selfie

3

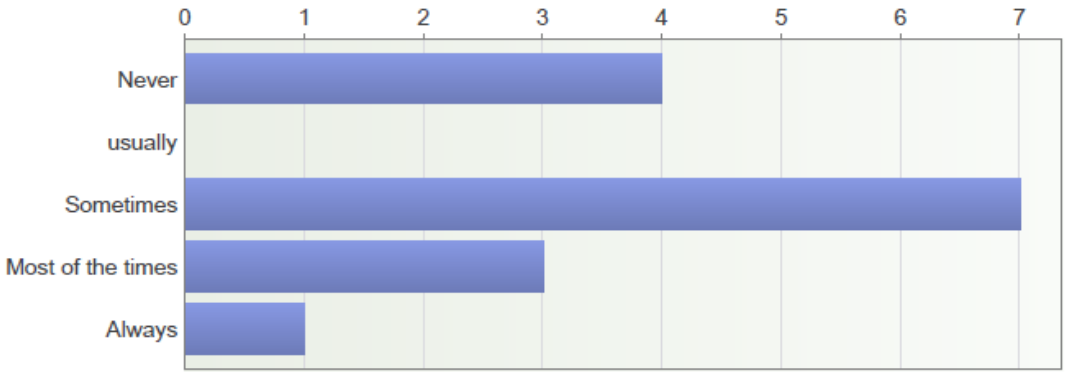
- News
- Facebook
- facebook
- chat on
- N/A
- Instagram
- Facebook
- Social network

4

- Cartoons
- whatsapp
- facebook, instagram
- Internet
- Google

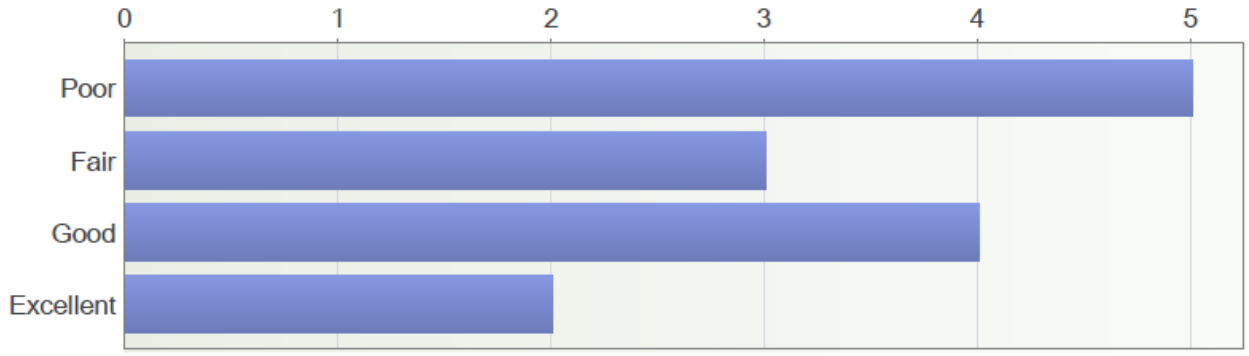
14. How often do you use the computer?

Number of respondents: 15



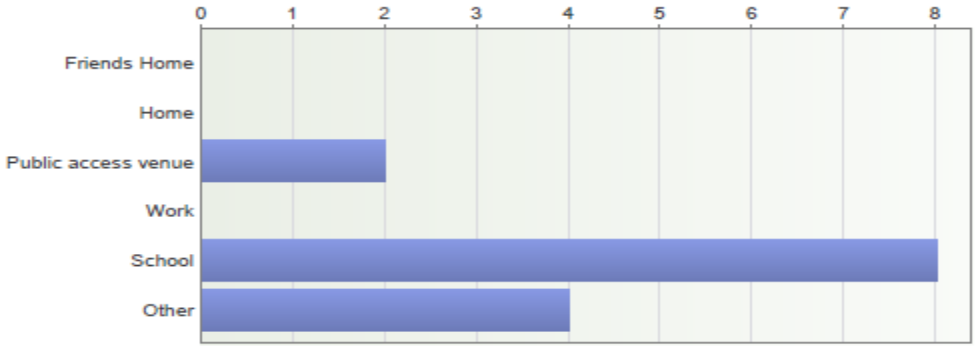
15. How do you consider your computer skills

Number of respondents: 14



16. Which of the following places was the most important for developing your computer or internet skills?

Number of respondents: 14

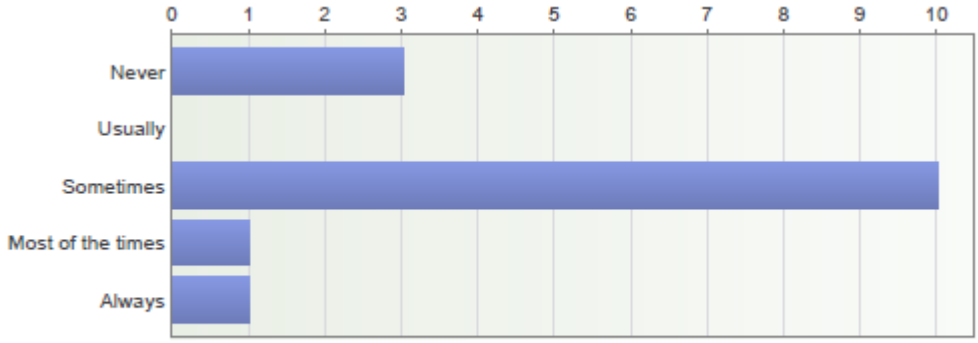


Open text answers: Other

- Public access and school
- kayec equip me with computer skills, Microsoft, excel
- Youth Cafe
- School, basic computer course

17. How often do you use the internet

Number of respondents: 15



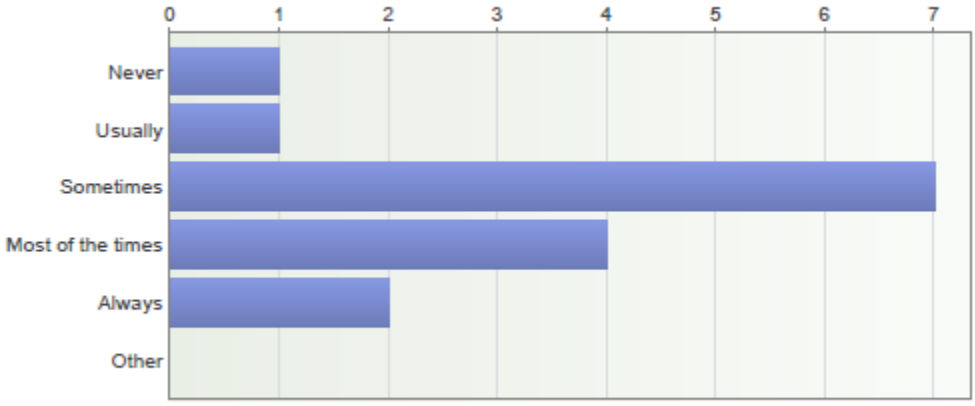
18. To what extent do you agree or disagree with the following statements:

Number of respondents: 14

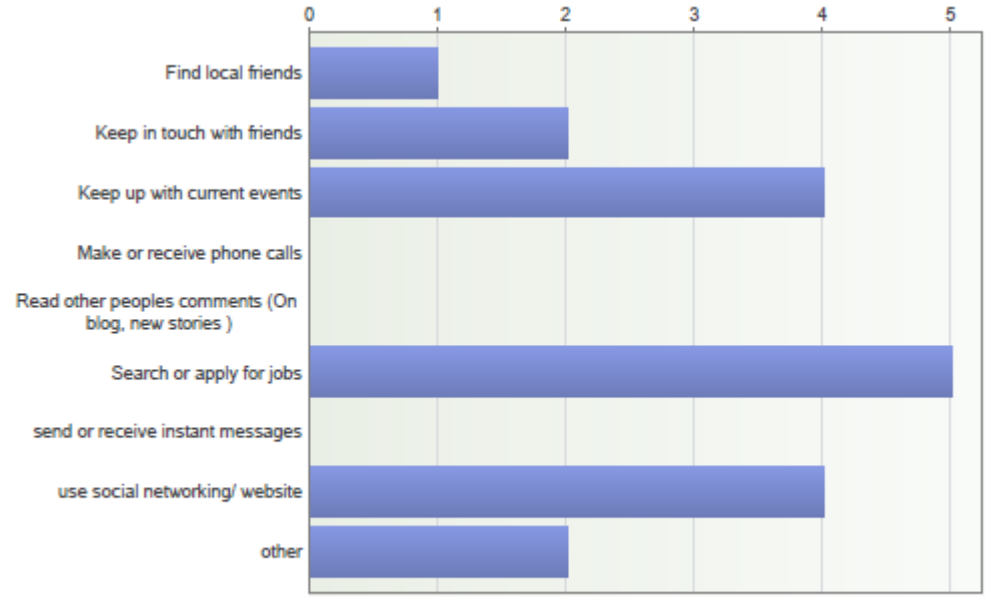
	Strongly Agree	Somewhat agree	Somewhat disagree	Strongly disagree	Don't know	Total	Average
The internet is confusing and hard to use	2	5	1	4	2	14	2.93
I often fell like i need someone to help me when i use computer	6	2	0	3	2	13	2.46
using a computer is an enjoyable experience	11	2	0	0	1	14	1.43
Total	19	9	1	7	5	41	2.27

19. How often do you register for data bundles: SuperAweh, Aweh, AwehGo etc

Number of respondents: 15



20. If you use the internet, in a typical month, what do you most often use it for?
Number of respondents: 14

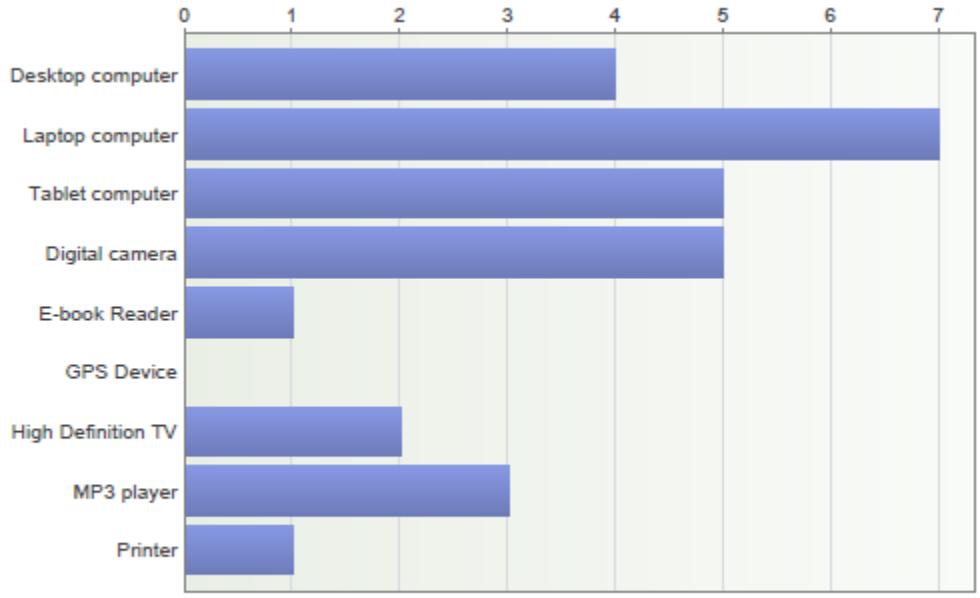


Open text answers: other

- find answer to difficult questions in my assignments
- No Internet

21. Which of the following electronic devices do you use

Number of respondents: 13



22. What attracts you to keep on using these technologies

Number of respondents: 12

- Movies
- To hear what is moving around the world
- Its very efficient in communication
- It makes your mind relaxing
- easy and fast
- They open up a wealth of knowledge to so many people.
- Technology is the reading network in the world
- N/A
- Easier and much accurate work
- Easy and cheap to use
- The info that I get from the Internet
- Send and recieve instant message

23. How did you find out about these technologies

Number of respondents: 11

- Good events
- By using electronic devices

- Makes work easier and faster
- When i am at school
- when reading about news in the world
- Ever sine i started attending school, I've been doing computer studies.
- Through training program from other institutions NUST, NBII, e.g.
- N/A
- Friends ,School
- Through friends
- From friends

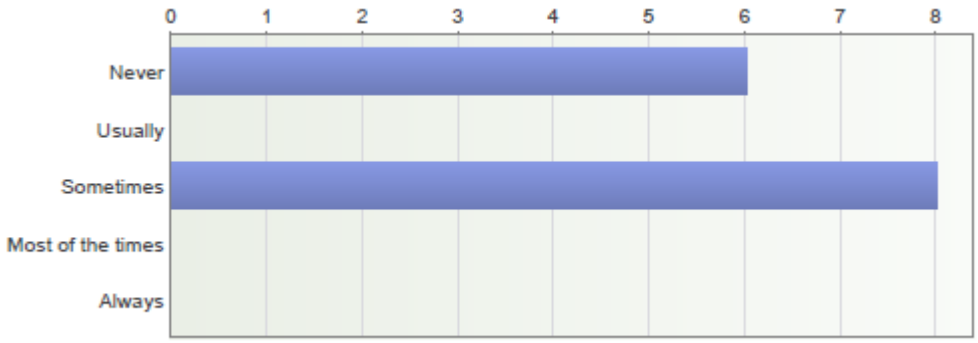
24. Name at least two youth services you know in Namibia

Number of respondents: 11

- Oyo
- Yetu-Yama
- National Youth Services National Youth Council
- I dont know
- NTA and Swapo youth league
- OVO, National art gallery of Namibia
- Kayec, N.Y.S.
- Youth Services
- OYO
- Don't know
- Equipped dance Oyo

25. How often do you make use of these services

Number of respondents: 14



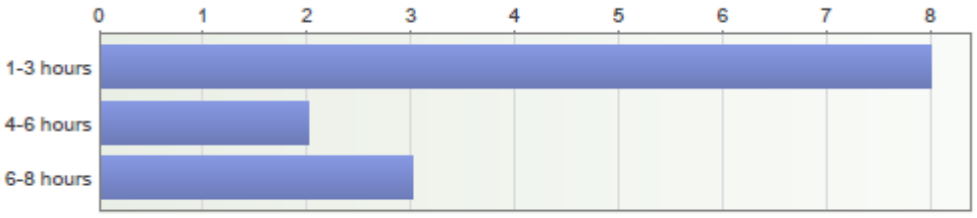
26. How did you find out about these services?

Number of respondents: 9

- From a friend
- It improves the development
- Found them in the newspapers
- They visit schools and play dramas and many encouraging play
- Refers from friends and newspaper, the Namibian, new era, e.g.
- Radio
- Cousins
- Through friends
- On social network

27. In a typical day, how much free time do you have?

Number of respondents: 13



28. What do you do during your free time

Number of respondents: 14

1

- Reading my Magazines
- Reading
- Playing soccer
- Marketing my products
- Playing soccer
- reading newspapers
- talk to friends
- reading magazines
- Reading
- Kapana

- Reading newspaper
- Study
- Facebook
- Relaxing and play with friends

2

- Jumping
- Searching information
- Watching TV
- Watching TV

- helping the family
- encourage learners around the hostels
- watching tv
- Selling Fish
- Washing
- Read Magazines
- Instagram

3

- Making bed
- exercising
- have fun (talk stories)
- and less in the day
- Watching TV
- Hangout

4

- Cooking
- read a novel
- Exercising
- Running

29. What kind of skills do you have?

Number of respondents: 13

skill 1

- Cooking
- Customer service
- For communication

- Building
- Communication
- communication
- drawing, swimming
- manage a business
- Cooking
- Washing
- Communication
- Computer skills
- Communicating with people

skill 2

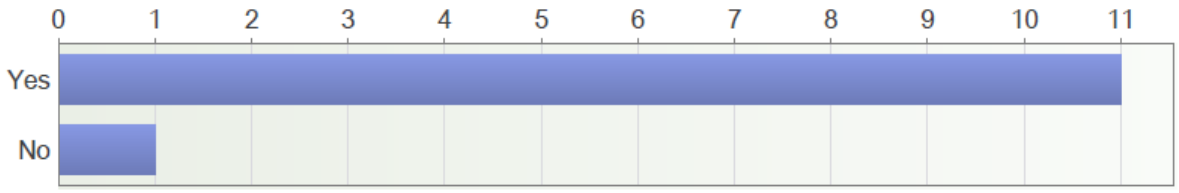
- Making laundry
- Administrative Skills
- Business coaching
- studying
- organise meetings
- Being a gurdian
- Cooking
- Computer skills
- Editing skills
- Readership skill

skill 3

- Iron
- doing hair, running
- and participate in different events
- Neighborhood watch (home and Network)
- Making hair

30. Do you consider sharing your skills with others in Havana

Number of respondents: 12



31. Apart from Money, what else do you want in return in order to share your skills and time with others?

Number of respondents: 11

1

- Clothes
- Experience
- Enough time
- application
- nothing, but
- teach other to learn
- Food
- Anything good you have
- Appriciated
- Awards on good work
- Communicating

2

- works as a team
- Knowledge
- blessings from above
- help them where necessary
- Classes for cooking

3

- Clothes

4

- Learninng

32. What type of activities would you participate in if they were available in Havana

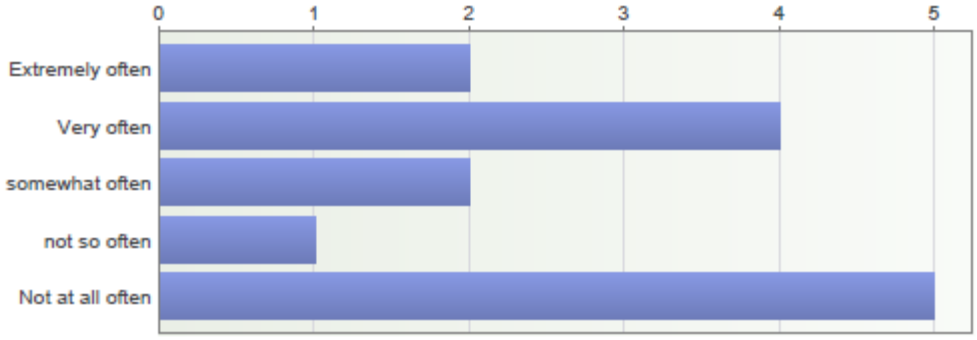
Number of respondents: 12

- Making some sewing
- Bible studies choir

- Volley ball
- Act
- youth league group
- dancing, doing hair, teaching people how to read and write, create kids club
- run an organisation or centre or sport club
- Home and Network
- Dancing
- Training computers
- Drama,English classes
- Soccer

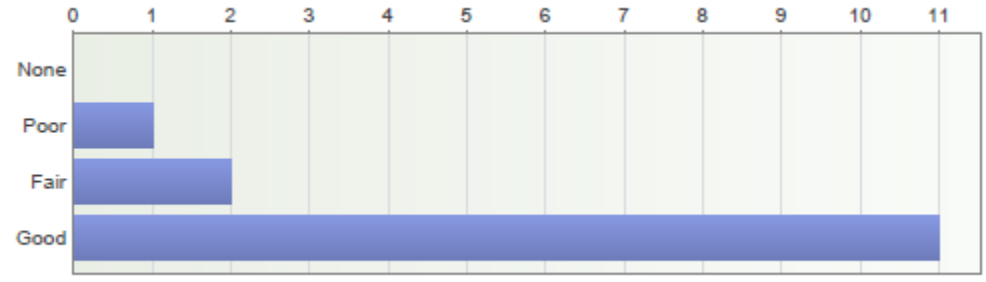
33. How often do you participate in activities in Havana

Number of respondents: 14



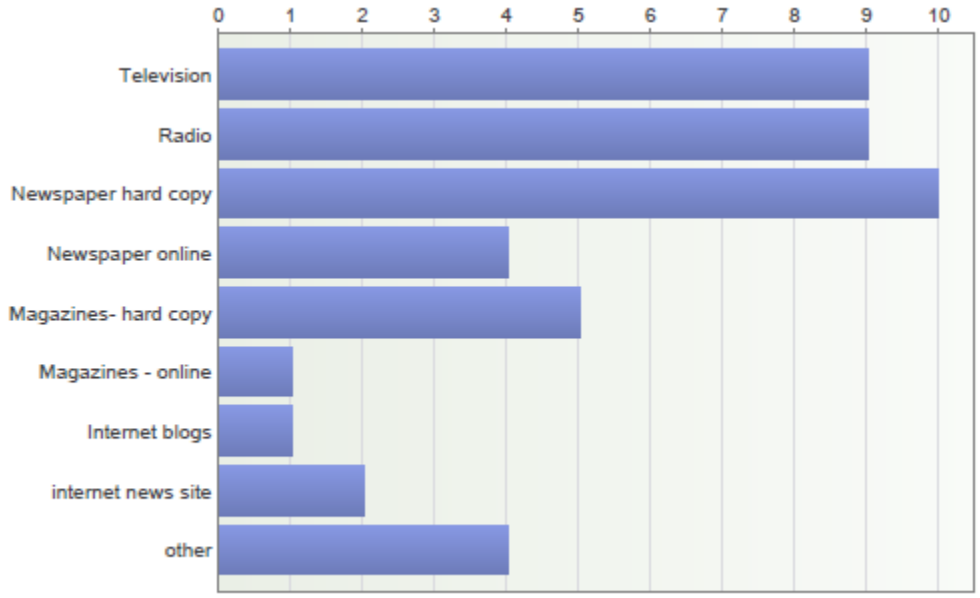
34. What is your ability in English (Reading, writing, Talking)

Number of respondents: 14



35. Where do you currently get your information about local news

Number of respondents: 15

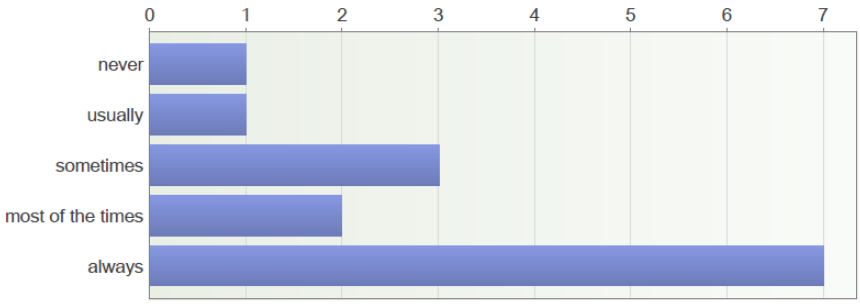


Open text answers: other

- Through offices
- also friends at school
- paticipate from NUST and NBII or communities participants
- Gathering

36. How often do you share information with others?

Number of respondents: 14



37. what kind of information do you share

Number of respondents: 11

1

- Facebook
- latest News
- Job Information
- news
- what happened in the parliament yesterday
- Invitation
- Crime
- latest news
- Job opportunities
- Current issue
- Things that happen every day

2

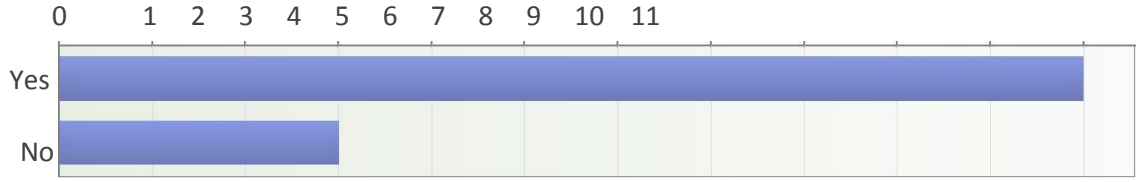
- Radio
- things that happen in the world
- what is the latest released song (int)
- New Technology
- Courses
- current affair
- Meetings in the communities
- Being away with bad friend

3

- who came out with what (current affairs)
- and development
- School staff

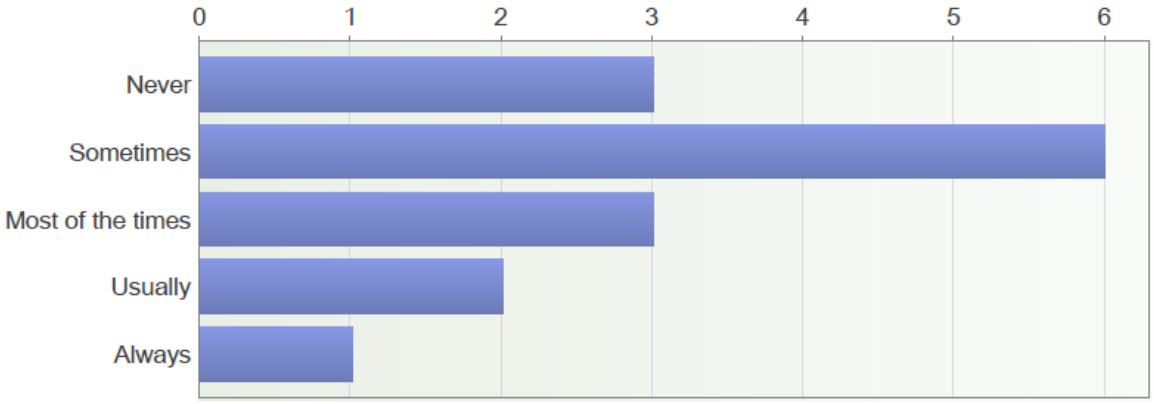
38. Do you use social media to share information

Number of respondents: 14



39. How often do you use social media (Facebook, twitter, whatsapp) to share information

Number of respondents: 15



40. Where do you most frequently obtain information on the following

Number of respondents: 13

	News paper	Books	Videos	audio	TV	Internet	Friends	Professionals	Others	N/a	Total	Average
Heath issues	5	1	0	6	4	3	4	1	1	1	26	4.77
Job or business	7	1	0	6	3	2	3	1	0	1	24	4.13
Government and politics	5	0	1	4	5	3	2	1	1	1	23	4.7
Education and School	5	5	1	5	2	2	1	3	1	1	26	4.23
Local Event and news	7	0	0	5	5	3	3	1	1	2	27	4.74
World news	4	0	1	4	7	3	1	1	1	2	24	5
Local culture and Languages	3	2	1	4	5	2	6	1	1	0	25	4.88
Total	36	9	4	34	31	18	20	9	6	8	175	4.63

41. Approximately how often do you use the following for information and communication

Number of respondents: 15

	Daily or	At least	At least	a few			
	Almost	**once**	**once**	**times**	**Never**	**Total**	**Average**
	Daily	week	month	year			
Newspaper or printed media	7	4	1	1	1	14	1.93
Books	8	5	2	1	0	16	1.75
Radio	11	1	0	1	0	13	1.31
TV	7	3	1	1	3	15	2.33
Videos or DVDs	3	5	1	1	2	12	2.5
Computers	5	1	1	2	4	13	2.92
The internet	5	3	3	0	2	13	2.31
landline phones	1	0	1	1	7	10	4.3
Mobile phones	12	1	0	0	0	13	1.08
Family and friends	14	0	0	0	0	14	1
Professionals such as nurse, agricultural	2	1	4	2	2	11	3.09
Total	75	24	14	10	21	144	2.23

42. What do you like least about Havana

Number of respondents: 13

- Playing soccer
- No Electricity
  No Access to internet
- Free water and electricity
- Road
- Family members and friends
- its devopment
- The housing, the odour, poor living conditions, squatter camps, crimes, etc
- better to leave on rental
- Electricity
- Thieves misbehaving
- Poor living conditions
- The development of havana is too slow
- Nothing that I like least in havana

43. What do you like most about Havana

Number of respondents: 12

- Reading Bible
- Own place
- Tared road
- People
- Situation
- the shops are closer to the nation
- The sense of humour of the people around
- lets say no electricity
- Gathering with youth Home & Network
- The people are good to cuddle with
- Shops are close to the people
- The environment itself

44. What changes would most improve Havana

Number of respondents: 10

- Nothing
- Mobile police and police station Businesses such as Usave
- Electricity
- Shops
- more and more development needed
- dumping sites should be cleared.
  strict laws should be applied concerning crime and usage of services.
- Home & network Cleaning the place
- Better housing
- I would love to bring in a library
- Electricity and library

45. About how long have you lived in this neighborhood?

Number of respondents: 14

years

- 5
- 5
- 8
- 3
- 3 years

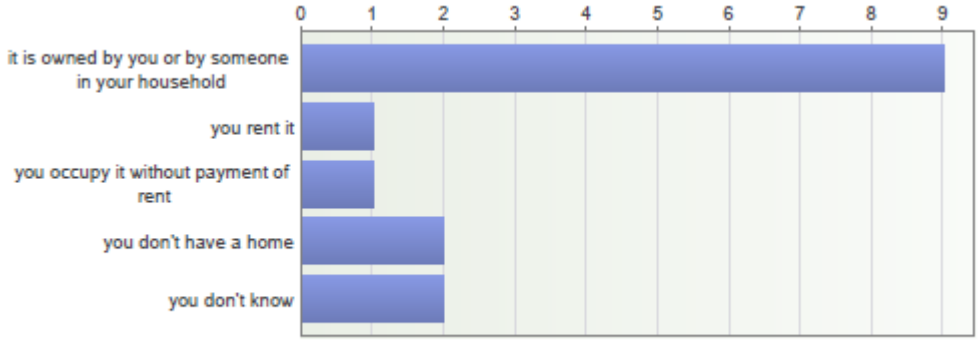
- 2
- 2013-2016
- 8
- 26
- 20
- 2015/2016
- 2

Months

- 7
- 4
- 9 months
- 24
- jan till now
- 7 months
- 24
- 6

46. which of the following best describe your home

Number of respondents: 15



2. Organisations and services identified

Organisation	Description	Services offered	Online (Yes/ No)	Method used to acquire data
OYO	OYO is a Namibian organisation, which aims to create HIV/ AIDS awareness among the youth through artistic performances. The Organization also has a magazine "OYO, Young, latest and cool" which features the youth's discussions and address their questions and concerns" (OYO, 2016).	Magazine, awareness performances	no	Questionnaire
Yetu Yama	Yetu Yama is the main Centre for the Namibia College of Open Learning (NAMCOL). Yetu Yama centre provides educational services to out of school youth and adults (NAMCOL, 2016)	Grade 10 and 12 classes, Vocational education	No	Questionnaire
National Youth Council (NYC)	NYC aims to "To foster among the Namibian youth a spirit of national identity, a sense of unity and self-respect, as well as in depth awareness of social, economic, political, educational and cultural prospects and adversities " (NYC, 20126)	Initiate youth projects, funds, encourages artistic and literacy	No	Questionnaire, Focus Group
National Youth Service (NYS)	NYC is responsible "to deliver relevant national services and offer recognized skills training and personal development programmes to the youth through attaining	Vocational training	No	Questionnaire

	the requisite institutional capacity while engaging in income generating ventures" (NYS, 2016)			
SWAPO Youth League (SPYL)	"The SPYL is a progressive youth political wing, born out of the crucibles of the anticolonial struggle for freedom and national independence, and embodies the same principles as those of SWAPO Party. SPYL serves as an active, revolutionary, and militant transmitting belt of the SWAPO Party ideology, policies and programmes" (SPYL, 2016)	Political	No	Questionnaire
Kayec	Kayec provides different skills training to the out of school youth (Kayec, 2016) -	computer training	Yes	Questionnaire, Focus Group
Equipped Dance Academy (EDA)	EDA trains dancers (EDA, 2016)	Dancing	No	Questionnaire
Havana Mobile police	Police station in Havana	Security	No	Focus Group
Reconstructed Living Labs (RLabs)	"Reconstructed Living Lab (RLabs) is a global movement and registered Social Enterprise that provides innovative solutions to address various complex problems" (RLabs, 2017)	Computer / mobile phone training	Yes	Focus Group
Vocational Training Centre (VTC)	"The centre is committed to vocational training, which will equip Namibia with an adequately skilled labour force that will in turn strengthen socio-economic development and self-employment" (WVTC, 2017)	computer training Apply online get your results online	Yes	Focus Group

		download information or application forms		
ST. Michael Angelican Church	Church in Windhoek	Church service	No	Focus Group
Namibia Statistics Agency	Provides statistical reports for the government	offers training to the youth where mostly the youth use the handheld GPS to collect data	No	Focus Group
Shack Dwellers federation of Namibia (SDFN)	“The Shack Dwellers Federation of Namibia (SDFN) is a network of housing saving schemes, aims to improve the living conditions of low-income people living in shacks, rented rooms and those without accommodation, while promoting women's participation. SDFN is affiliate to Shack Dwellers International (SDI)” (Shack Dwellers Federation of Namibia, 2017)	Namibia encourage the youth to save on their saving book help the youth to come up with their small business, offers training in profiling, mapping, survey, enumeration on computers	No	Focus Group
Kabila Co mmunity Centre in Havana	The community centre is used as a church and a kindergarten. The centre is also used as a venue for any community engagements in Havana	Church service, kindergarten, community meeting	No	Focus Group
Namibia Housing Action Group (NHAG)	“Namibia Housing Action Group is a Namibian Service Organization and aims to support and add value to the activities and processes of the Shack Dwellers’ Federation of Namibia in achieving their mission. It strives to facilitate change in the livelihood of urban and rural poor through pioneering pro-poor development approaches” (Shack Dwellers , 2017)	offers laptops to shack dwellers youth to enter data that the youth have collected in the field	No	Focus Group

International University of Management	Private University in Namibia (IUM, 2017)	You can write exams from home using a computer or laptop	Yes	Focus Group
Lida Cleaning Services and African Labour Services	It is a company that specialize in Carpet/dry Cleaning as well as office cleaning (AfricanAdvice, 2017)		No	Focus Group
Rossing Foundation	Some of the foundation's mandate includes "To create opportunities for people to use their education, provide advancement of the living standards (Rossing Foundation, 2017)	computer training	Yes	Focus group

Table 10: Organisations and services identified

3. Focus group action plan

Discussions / questions	Aim – to find out …	Scenario	Expected outcome
What comes into your mind regarding the topic	To break the ice	Not required	Get the overview of their thoughts. Just getting the youth in the talking mood
Digital services known	The digital services the youth knows	Services that are supporting you	A list of digital services on a flip chart paper
Digital services used	The digital services mentioned in 1	Not required	A list of digital services they use
Why only some services	Why only some digital services but not others	Not required	What they prefer
How do they know of the digital service IF no answer THEN how do they inform themselves	The ways the youth learn about the digital services	Not necessary	Ways the digital services were adopted

New digital service deployment	How they would want the services to be deployed – with what features?	If there is service X to be specifically developed for Havanna youth, how should we make sure that everybody who will benefit start using it?	Deployment ideas or options, criteria for good service
Digital service features attraction	Features that attract them to keep on using the technology	Imagine if you have to design a digital service for the other youth or for yourself, what features will you be built in?	Features of a good digital services
Is there anything else you would want to say	Comments / questions & suggestions		Suggestions / questions

4. Commitment session Questionnaire

1. Goal
2. How likely do you think it is that you can achieve your goal in 6 months

Not at all Not at all

3. How important is it to you that you will achieve your goal is 6 months

Not at all Not at all

4. How disappointed would you feel if you did not achieve your goal in 6 moths

Not at all Not at all

5. First training programme: 24 April-26 April

Day 1 – Monday, 24 April 2017

13:00 Arrival

13:30 Welcoming & Intro to RLabs/NBII/NUST + Facilitators

Overview & Focus for 3 days & Final Goal + to be present on all days + English/translation, and questions anytime + 'Spirit of Collaboration'

13:45 Introduction Exercise – in pairs (these questions were printed and distributed)

1) Your name & tell us something about yourself?
2) What are you passionate about (e.g. when you were growing up)?
3) What kind of project or idea brings you here to this workshop?

14:45 Presentation on "Innovation & Social Entrepreneurship"

15:00 Small Groups (4-5) around:

- ✓ Issues and Challenges in our Community?
- ✓ Ideas / Actions to address these issues? + Who is going to do it?
- ✓ Questions / Needs identified

15:30 Juice/Snack Break

15:50 Joint Reflections with the whole group, step by step:

1) Issues/Challenges,
2) Ideas/Actions, and
3) Questions/Needs

16:45 Project Life Cycle, with brief example

16:55 Fill in short questionnaire and give Homework

& Closing (done by 17h)

Homework: (printed out and distributed)

Think more deeply about an idea/project you like to work on, individually or as a group.

- What are you deeply passionate about and/or really good at?
- What issue or problem are you trying to address?
- What is your innovative idea to address it?
- What else is your project all about?

- Who is going to benefit?
- How will they benefit?
- When/how can you start with your project, and how would the first steps look like?
- How would you ideally see your project growing over time?
- What is the 'big dream' or ideal vision of your 'perfect and successful project'?
- Who is doing what to get there?
- What kind of resources will you need?
- What other kind of support would be helpful?
- How will you measure success?

Day 2 – Tuesday, 25 April'17

- ✓ CheckIn
- ✓ Youth Presenting their project/ideas they would like to work on (= homework from day 1)
- ✓ Feedback (Is the idea/project viable)
- ✓ Presentation: Budgeting and costing

Break (snacks)

- ✓ Group work/individual exercise: Budget & Costs
- ✓ Taking of pictures/scenarios for their profiles (Crowdfunding) platform
- ✓ Showing screenshots of different crowdfunding platforms and how people present themselves online
- ✓ Wrap up

Day 3 – Wednesday, 26 April'17

- Check the homework – verify if write up is correct

- Let the youths create email accounts for those don't have
- Show the youths how the system works and the step by steps on how to upload a project. This is because some of the youths have never seen the system before and it crucial that they know the steps before hand.
- Let the youths upload their project
- Close

6. Evaluation Questionnaire : C2:E2

Dear Click here to enter text.

Few months back you took part in a group activity with Asnath, in the first step of the activity you came up with a shared group goal:

"Deployment of the Crowdfunding System"

You were then asked to come up with a personal goal. You named a goal that you could complete in order to contribute and achieve the group goal. This is what you wrote:

Please answer the questions about your named goal/s on below

Goal:

1. Did you achieve this goal:

   Not at all completely

   1 2 3 4 5 6 7

2. Please name the steps you have taken so far to achieve this goal

   ……..

   .....

3. Do you want to continue working towards this goal?

   Not at all completely

   1 2 3 4 5 6 7

Please think back to the group goal:

Deployment of the crowd funding system

1. Do you think this goal has been achieved?

Not at all very much

1 2 3 4 5 6 7

2. How disappointed would you feel if this goal was not achieved?

Not at all very much

1 2 3 4 5 6 7

3. Do you think you have contributed to this goal

Not at all very much

1 2 3 4 5 6 7

4. Do you want to continue working towards this goal?

Not at all very much

1 2 3 4 5 6 7

New Questions

5. How many people did you manage to invite/convince to sign up on the crowdfunding system or at least come for the training?(proof maybe)

……

……

6. How did you invite others to join/ through what medium did you pass the message on?

……

……

a) If the method used worked? How did you made sure it worked? **Or**

……

……

b) Why do you think it did not work?

……

……

7. Looking at the adoption plan:

a) The steps that were not done, why haven't you completed those *(name the one not done?*

……

……

b) How effective was using Facebook and posters?

Not at all						**very much**
1	2	3	4	5	6	7

8. Why did you choose to commit?

……

……

……

9. What will you be doing from today on to ensure that the system is well deployed?

……

……

……

10. What would you like in return to ensure that **(9)** is completed?

……

……

……..

7. Registration form C3;AP3

Application form for the Training and for project registration on the crowdfunding platform

First name:

Surname:

Cell number:

Physical address:

Name of the person who gave you the form:

Project name:

……

…….

Describe your project in details here:

……

……

……

……

……

……

……

……

……

……

……

……

What is your goal?

……

……

……

……

What support do you need for your project to come to life?

……

……

……

……

How is your project benefiting the community?

……

……

……

……

……

……

……

……

Signature: **Date:**

Crowdfunding

- "The practice of funding a project or venture by raising many small amounts of money from a large number of people, typically via the Internet" (Oxford University Press, 2017)

Please take note:

- If you sing up and your idea is selected, you will attend a 3 day **FREE** training offered by RLabs Namibia. The training will be on Social entrepreneurship:
    - How you can solve acute problems in your community using entrepreneurship
    - You will be trained on how to budget for your project
    - How you can fine tune your idea
- Your project will be uploaded on the crowdfunding platform
- If you successfully complete the training, you will also receive a certificate of attendance and attend the RLabs Namibia graduation ceremony, which is attended by hundreds of youth from different suburbs in Windhoek.

8. Second training programme : Refining the adoption strategy

Day 1 Meet up with the youth to hand out the application/project idea form (30 min)

Proposed date: 29 September 2017

- The form will be handed over to all the contacts in Havana
- Everybody who accept to receive the form should bring all forms back, filled in or not
- All forms need to be delivered before the training. This way, it is easier for RLabs to know how many people will be trained and for them to have a look at the proposed ideas

- On this day, the youth will receive the name tags to identify them
- Forms to be returned on the 4th September 2017
- All names for of those that received the forms will be recorded as well as the names of their recruits. This will make it easier to track on who signed up who

Day 2 – 4 Training by RLabs

Proposed date 6-8 September 2017

- Only those that have submitted the ideas will be admitted in the training
- The third day the youth will sign up on the system
- All those that have successfully attended the training will receive a printed shirt
- Any of the youth that submitted forms back and their recruit managed to attend the training and sign up on the system will receive a reward of N$100.00 on their project. Hence, the more people you recruit and sign up on the system, the more money they will receive.

Throughout this process, there will be three rewards mainly for motivation purpose. The youth will be informed of the reward system from the first day

1. Get a tag with the forms
2. Get a T-shirt upon return of 5 forms or more
3. Get a 100 N$ on your own project upon successful upload of project of recruited person
4. The new people will get a certificate for the training (not a T-Shirt). Only recruiters get T-Shirts.

Initially, the refined strategy was supposed to be tested on a new system, however, considering the snags and lengthiness it took the youths to understand the system, we have reconsidered applying the refined version to the crowdfunding system again.

9. Informed Consent Form

Consent Form

You are invited to take part in research and development activities with the team from the Faculty of Computing and Informatics at the Namibia University of Science and Technology (NUST).

We will jointly engage in technology co-design sessions. We will additionally have discussions, questionnaires, and interviews, enquiring about your needs, thoughts, and personal information. The specific aim of these will be communicated before each activity.

You will be told about the time of each session before you begin. You can decide whether you want to take part or not. Taking part is voluntary and you are welcome to stop taking part at any time.

Participation in this study is limited to individuals **age 18 and older.**

There are no known risks to taking part in this study beyond those of everyday life.

Any information that identifies you individually will not be passed onto third parties; only members of the team will have access and treat your information confidentially.
We would like your permission to take pictures, take video and or/voice recordings during the sessions.

If there is anything about your participation that is unclear or that you do not understand, and if you have questions or wish to report a research related problem, you can email Shilumbe Chivuno-Kuria at schivuno@nust.na or call at 2072057.

I have read and understand the information above. I agree that I have read and understand the information above and that I want to participate in this research.

Name Signature Cellphone number