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**The Development of Northern Sotho Linguistic
Terminology for Higher Education in South
Africa.**

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Master's Degree.**

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Linguistics**

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Declaration.

I declare that, the development of Northern Sotho Linguistics terminology for higher education in South Africa has not been submitted for any degree or examination in any other university and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Mmanape Mosana Hlungwane

March 2020

Dedication.

In a world that calculates your worth based on your profession, it has been hard to remain motivated and dedicated to one's goal. To have made it this far with all the obstacles required a lot out of me, it took a lot out of me. This study is dedicated to me, Mmanape Mosana Hlungwane. The road is still long but you got it.

Acknowledgement.

My deepest gratitude is to my God, for having carried me until this far. I am thankful for the courage and strength He has given me when I needed it the most. I am this far because of His grace.

To my family: Mom, aunts and siblings, my nephew and niece. Ke le rata ka kudu. Ke leboga thekgo ya lena le lerato la lena.

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Abstract.

Terminology development is one of the key elements to the promotion of multilingualism and language development. Globally, the field of terminography has advanced through computer technologies, however, terminology development of indigenous African languages remains inadequate (Alberts, 2010). The aim of this study was to develop a Northern Sotho linguistics glossary for higher education. The study followed a qualitative method and thematic analysis approach. The English terms collected in this research were sourced from course material of the undergraduate syllabus in African languages at the University of the Witwatersrand and linguistics dictionaries. The Northern Sotho equivalents of the English terms were searched from Terminology and Orthography No.4, 1988 (T&O, No.4), grammar books and Northern Sotho general dictionaries. The total amount of terms harvested in the source language were 163, from which, only 63 equivalents were found in Northern Sotho. The terms were purposively selected based on whether they appear in the undergraduate syllabus. The author followed the theory of onomasiology to study the nomenclature of Northern Sotho in order to coin neologisms. Terms found and coined were entered into a FLex program and produced the glossary. The significance of the study lies in the fact that it would increase the vocabulary of Northern Sotho by creating new special terms in the language. This will be essential in developing the language, but most importantly in facilitating learning in higher education for mother tongue speakers of the language.

Key words: Northern Sotho, Terminology, glossary, phonetics and phonology, terms and linguistics.

Table of Content.

DECLARATION.....	II
DEDICATION.....	III
ACKNOWLEDGEMENT.....	IV
ABSTRACT.....	V
TABLE OF CONTENT.....	VI
CHAPTER 1: INTRODUCTION.	1
1.1. PROBLEM STATEMENT.....	2
1.2. THE PURPOSE OF THE STUDY AND RESEARCH QUESTIONS.....	3
1.2.1. RESEARCH AIMS.	3
1.2.2. OBJECTIVES.	4
1.2.3. RESEARCH QUESTIONS.	4
1.2.4. SIGNIFICANCE OF THE STUDY.	4
1.3. THE ROLE OF THEORY IN THE STUDY.....	4
1.4. BACKGROUND.....	5
1.4.1. HISTORY OF BAPEDI.....	5
1.4.2. HISTORICAL BACKGROUND OF NORTHERN SOTHO.	6
1.5. RESEARCH DESIGN.	9
1.5.1. RESEARCH METHODOLOGY.	10
1.5.2. SAMPLING.	10
1.5.3. DATA COLLECTION.	11
1.5.4. DATA ANALYSIS.	11
1.6. GLOSSARY.....	12
1.7. TOOLS TO BE USED.	13
1.8. SYNOPSIS OF SECTIONS.....	13
1.8.1. CHAPTER 1: INTRODUCTION.	14
1.8.2. CHAPTER 2: LITERATURE REVIEW.	14
1.8.3. CHAPTER 3: METHODOLOGY.	14
1.8.4. CHAPTER 4: RESEARCH FINDINGS.	15
1.8.5. CHAPTER 5: CONCLUSION.....	15
CHAPTER 2: LITERATURE REVIEW.....	16
2.1. INTRODUCTION.	16
2.2. THE HISTORY OF MODERN TERMINOLOGY AND TERMINOGRAPHY.	16
2.2.1. THE ORIGIN OF MODERN TERMINOLOGY/ TERMINOGRAPHY.	16
2.2.2. TERMINOGRAPHY VS LEXICOGRAPHY.	18
2.3. TERM FORMATION PROCESSES.	19
2.3.1. TRANSLATION STRATEGIES USED IN TERMINOLOGY DEVELOPMENT.....	21
2.4. THEORY OF TERMINOLOGY.	23
2.4.1. THE ONOMASIOLOGICAL MODEL.....	24
2.5. TERMINOGRAPHY IN SOUTH AFRICA.....	26
2.5.1. THE BEGINNING OF THE DEVELOPMENT.....	27
2.5.2. CHALLENGES OF TERMINOLOGY DEVELOPMENT TODAY.	28
2.6. THE NEED FOR TERMINOLOGY DEVELOPMENT IN HIGHER EDUCATION.	30
2.7. CONCLUSION.....	34

CHAPTER 3: RESEARCH METHODOLOGY.	35
3.1. INTRODUCTION.	35
3.2. RESEARCH PARADIGM, APPROACH AND DESIGN.	35
3.3. RESEARCH METHOD.	37
3.4. SAMPLING.	40
3.5. ETHICAL CONSIDERATION.	41
3.6. DATA COLLECTION.	42
3.6.1. SECONDARY DATA.	43
3.7. REFLEXIVITY IN QUALITATIVE RESEARCH.	43
3.8. DATA ANALYSIS.	45
3.9. TOOLS USED.	47
3.10. VALIDITY AND RELIABILITY IN QUALITATIVE RESEARCH.	48
3.10.1. ENSURING VALIDITY IN THE STUDY.	49
3.10.2. RELIABILITY IN QUALITATIVE RESEARCH.	49
3.11. CONCLUSION.	51
CHAPTER 4: FINDINGS.	52
4.1. INTRODUCTION.	52
4.2. DATA MANAGEMENT.	52
4.3. THEORETICAL ANALYSIS.	53
4.3.1. PHONETICS.	53
4.3.1.1. INTRODUCTION	53
4.3.1.2. Acoustic phonetics.	54
4.3.1.3. Auditory Phonetics.	56
4.3.1.4. Articulatory Phonetics.	56
4.3.1.5. Vocal organs.	57
4.3.1.6. Airstream Mechanism.	61
4.3.1.7. Voicing.	62
4.3.1.8. Place of Articulation.	63
4.3.1.9. Manner of Articulation.	65
4.3.1.10. Vowel Articulation.	67
4.3.2. PHONOLOGY.	70
4.3.2.1. Phonotactics.	72
4.3.2.2. Syllable structure of NS.	75
4.3.2.3. Prosodic Features.	77
4.4. THE GLOSSARY.	78
4.5. FINDINGS.	79
4.5.1. ACCESS TO TERMINOLOGY.	79
4.5.2. NORTHERN SOTHO NOMENCLATURE.	80
4.6. CONCLUSION.	81
CHAPTER 5: CONCLUSION.	82
5.1. INTRODUCTION.	82
5.2. SUMMARY OF STUDY.	82
5.3. SUMMARY OF FINDINGS.	83
5.3.1. SOURCE DATA SEARCH.	83
5.3.2. NORTH SOTHO EQUIVALENTS SEARCH.	83
5.3.3. TERMS WITHOUT EQUIVALENTS.	85

5.4. THE GLOSSARY.....	88
5.5. CHALLENGES.....	89
5.6. IMPLICATIONS.....	89
5.7. LIMITATIONS.....	90
5.8. FUTURE WORKS.....	90
5.9. CONCLUSION.....	91
REFERENCES.....	92

Table of Figures.

FIGURE 1. FAMILY TREE OF NORTHERN SOTHO.....	7
FIGURE 2. GEOGRAPHICAL PLACES WHERE NORTH SOTHO IS SPOKEN.....	8
FIGURE 3. ŠTEKAUER'S ONOMASIOLOGICAL THEORY OF WORD FORMATION (PANOCOVÁ, 2015. P, 16).....	25
TABLE 1. DITHO TŠA MEDUMO 'VOCAL ORGANS'.	ERROR! BOOKMARK NOT DEFINED.
TABLE 2. <i>DITHO TŠA MEDUMO 'VOCAL ORGANS'</i>	61
TABLE 3. EQUIVALENTS OF <i>MOKGWA WA PUO</i> 'MANNER OF ARTICULATION'.....	66
FIGURE 4. IPA CHART OF THE NS VOWELS.	69
APPENDIX A.	99
APPENDIX. B	101
APPENDIX C.	105

Chapter 1: Introduction.

Various scholars such as (Alberts,2010), (Msimang, 2000), (Nkomo, 2010), etc. have studied the effect of terminology development on language and agree that the development of terminology leads to the promotion of multilingualism and language development. Standardized terms in special fields are instrumental to language practitioners and contributes to the quality of work that they do such as editing, dictionary compilation, translation, and subject related communication (Alberts, 2010). At a global level, the field has grown through the rise of computer technologies (Msimang, 2000). Though, terminology in South Africa has grown over the years, it is still inadequate with the result that official indigenous languages are not used as medium of instruction in most of the country's higher institutions (Msimang, 2000).

Though African languages have a sizable corpus of terminology, they remain undocumented or unavailable to date. The argument of the research is informed by (Nkomo, 2010)'s paper which discusses the issues confronting speakers and language specialists of indigenous African languages with regard to the deficiency of suitable glossaries for an assortment of purposes. In the article he examines specialised glossaries and draws from Wigand's general theory of lexicography and the theory of lexicographic functions and affirms the role of specialised glossaries and their impact on European languages, and also gives insights into how such glossaries might be valuable and created for the development of African Languages. He contends that glossaries in general have a significant task to carry in the development, acquirement and utilization of indigenous African languages (Nkomo, 2010).

In line with Nkomo's argument this research develops a glossary of linguistics terms, in NS for higher education in order to facilitate teaching and learning of the field. The glossary leads to

the development of NS by creating more new special terms in the language. Alberts (2010) and Msimang (2000) support the development of indigenous African languages to be taught in their own media in higher education. Alberts (2010) asserts that developing official languages into functional languages in all spheres of life is significant. Transferring, assimilating and retrieving information should be done in the first language.

1.1. Problem Statement.

In light of section 29(2) of the constitution that states that everyone has the right to receive education in the official language or language of their choice in public institutions where that education is reasonably practicable, the updated 2002 revised language policy for Higher Education declares that universities must diversify the languages of instruction to include indigenous official languages (Department of Education, 2002). This has seen some universities such as Rhodes, North West University and others move to teaching African languages in their own media. Some work has also been done for lower education such as the production of learner's dictionaries and the government's terminology and orthography, from 1983 to 1993. However, communicating scientific language in indigenous African languages remains a challenge in higher education.

The national language services (NLS) were established in 1998 with the aim of terminology development (Alberts, 2000). Its terminology division created terms and coined term list on various subjects such as Biology, Zoology, Physics, Weather Terms, Basic Health, Indigenous Birds, Commercial and Financial terms, Administration, Election terminology and others. The NLS became the foundation of information for the languages at a local, provincial, and national level, but more so for scientific and technical communication (Beukes, 2004).

Terminological work has since been taking places from private institutions and higher education, yet, to date some universities still teach the scientific study of languages in English. Webb, Lepota and Ramagoshi (2004) observed that Northern Sotho (NS) functions effectively as Medium of Instruction (Mol), the only problem is that it lacks technical learner's dictionaries. The only resources available are textbooks, learner's assessment certificates and orthography and spelling rules. Taljard and Nchabeleng (2011) argue that the only available dictionaries in NS are the bilingual term lists that help learners to contextualise the basic concepts in Science and Mathematics. As such, there is a dire need to develop terminology of the scientific study of NS in order to move towards teaching the linguistics of NS in its own media in higher education.

1.2. The purpose of the study and research questions.

1.2.1. Research Aims.

Communicating scientific language knowledge in indigenous languages remains a challenge due to the lack of resources and tools. Though, through the years there has been a paradigm shift to teach African languages in their own media, with some Universities having begun this journey, many still use English. The aim of the study is to develop and analyse a glossary of NS linguistic terms for Higher Education. This glossary will increase the vocabulary of NS by creating specialised linguistic terms in the language. This will not only be essential in developing the language's vocabulary but most importantly facilitate teaching and learning in Higher Education for mother tongue speakers of the language.

1.2.2. Objectives.

The objectives of the research are 'four' fold:

1. To harvest linguistic terms in English.
2. To find and analyze equivalents of the terms in North Sotho.
3. To coin and analyze neologism where research draws insert a blank.
4. Lastly to develop a term bank for these terms.

1.2.3. Research Questions.

To achieve the aim of the research the following questions will be addressed:

1. How will the terms be collected and stored?
2. What are the equivalents of the harvested terms?
3. What theories will be used to develop and analyze the neologisms?

1.2.4. Significance of the study.

Terminology development of official languages leads to the development of the languages into utilitarian languages in all circles of life such as higher education, politics and others (Alberts, 2010). Therefore, the significance of the study lies in the fact that it would increase the vocabulary of NS by creating more new special terms in the language. This will be essential in developing the language but most importantly facilitate teaching and learning in Higher Education for mother tongue speakers of the language.

1.3. The role of Theory in the study.

The theory utilised within the study is called the theory of Onomasiology. Onomasiology is a theory of terminology that deals with concepts and/or phenomena and the terms that represent them, in particular contrasting terms for similar concepts in a lexicon. The theory looks at the designations of a particular concept, that is, at a multiplicity of expressions which

form a whole (Grondelaers, & Geeraerts, 2003: 69). Onomasiology studies the terms and understands the concepts by relating them to other concepts before giving terms their actual terms. According to Onomasiology a term must have the conceptual, linguistic, pragmatic and foreign specifications. Taking into consideration the objectives of the study that is to harvest linguistic terms, to find the equivalents for the terms given; to coin new terms where there are no equivalents and to develop a term bank for these equivalents. This study will use the Onomasiological approach because it offers an analytical tool with its goal of finding words that describe a given concept, idea, or object.

1.4. Background.

1.4.1. History of Bapedi.

The precursors of the Pedi are thought to have settled in the present district around 500 years' prior in the wake of having moved from Central Africa to Southern Africa (Mokwana, 2009:32). The Bapedi originated from small chiefdoms formed before the 17th century. The armies of Mzilikazi, the king who founded the Matabele kingdom, defeated them in the 19th century. Pedi chief Sekweti then revived them. The Pedi are of Sotho origin, known to have descended from Bakgatla. In spite of the fact that uncommonly little is known about the historical backdrop of the Kgatla for the initial two ages after their originator, Mokgatla, had prevailing from the parent gathering. Legabo, Pogopi and Botlolo succeeded him. The tribe was divided into two after the death of Botlolo, lead by Mogale and Tabane. Mogale, the elder son, remained near Rustenburg and this section became known as Moseitlha. While the bakgatla ba Moseitlha remained together as one tribe, Tabane left with his group and settled at what is known as Schilpadfontein. This group eventually gave rise to the Mmakau, and

Motšha. A junior brother of Mmakau was 'Lellelateng' whom later conquered the Pedi-clans and became their first chief, Thulare (Breutz, 1989).

Despite the fact that the Pedi began from the Bakgatla and were of Sotho origin, their intermarriage with other tribes by defeating them brought about the use of numerous different words in the Pedi language and customs that are not of Sotho origin but that are similar to Zimbabwe's Venda, Lovedu and Karanga (Mokwana, 2009).

1.4.2. Historical background of Northern Sotho.

The NS language consists of a collection of approximately 30 related dialects such as seTlokwa, seBirwa, seKhutswe, seTswapo, seBidi etc, all generally mutually intelligible and all related to each other. Generally, what is presently the official language has been founded fundamentally on Sepedi, as the evangelists who built up the orthography had contact with the pedi people. The name Sepedi in this manner came to be respected, to some degree inaccurately, as being synonymous with Sesotho sa Leboa, and further disarray emerged when the constitution referred to Sepedi as the official language. This is not strictly correct, as it would exclude other NS dialects from official recognition. As such, when alluding to the official language, it is preferable to use the term Sesotho sa Leboa (Semenya & Potgieter, 2014).

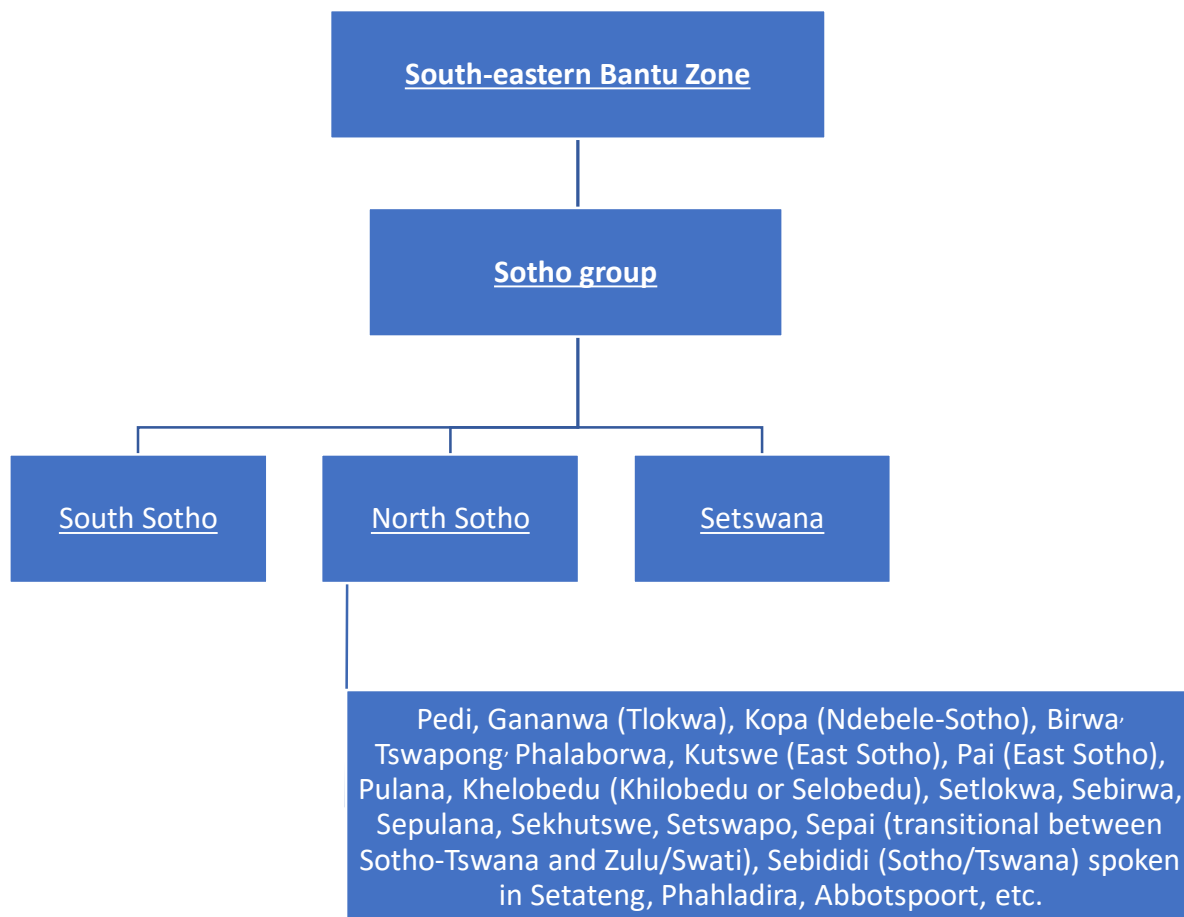


Figure 1. Family tree of Northern Sotho.

Sesotho sa Leboa is most closely related to two other languages in the Sotho language group, Southern Sotho also known as Sesotho and Setswana as shown in Figure 1. above. The three falls under the Sotho group and together with the Nguni group, Venda and Tsonga group are part of the South-eastern Bantu Zone. South Sotho and Setswana also include a number of dialects that are mutually inteligeable. The division into these three principle dialects has commonly been founded more on chronicled and social variables than phonetic elements (Guthrie, 2017). There is a large amount of mutual intelligibility between all three. The map

in Figure 2 below depicts the geographical places where NS is spoken in South Africa. The areas are Limpopo (Dark blue), Mpumalanga (light blue) and Gauteng (light green).



<https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pinterest.com%2Fpin%2F314055773992848760%2F&psig=AOvVaw1h34DRB7z127qZXej7usc&ust=1590141535313000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCKiB9v3cxOkCFQAAAAAdAAAAABk>

Figure 2. Geographical places where North Sotho is spoken.

Northern Sotho is one of the 11 official languages primarily spoken in South Africa and is known to be the first language of people from Limpopo, Mpumalanga and Gauteng. NS has several distinct varieties (dialects) such as Lobedu also known as Khilobedu or Selobedu which is a variety of NS that exist only in an unwritten form. Though there are efforts to reduce it to its written form, the Khilobedu community uses the standard NS language and orthography for teaching and writing. Khilobedu is spoken mainly in Modjadjiskloof, in the Limpopo province. It is associated with the monarch Queen Modjadji also known as the Queen of Rain.

Sepulana also known as sePulane is also one of the NS variety that exist in an unwritten form. Like the Khilobedu community, the Mapulana community use the standard NS Language and orthography for teaching and writing. Sepulana is spoken mainly in the Bushbuckridge area in the Mpumalanga province. There are other NS varieties such as seTlokwa, seBirwa, seKhutswe, seTswapo, seBidi with urban varieties of it such as Pretoria Sotho having acquired clicks from Nguni languages (Breutz, 1989).

The morphological and lexical variety among these dialects has prompted the affirmation that NS is close to a holding classification for otherwise unclassified Sotho-Tswana assortments spoken in south-eastern Bantu Family. The linguistic terms of this study are compiled in the standard NS, as such some terms might not be found in the different varieties (Mokwana, 2009).

1.5. Research Design.

The philosophical assumption underlying this research is that of constructivist/interpretive tradition. This implies a transactional epistemology and the ontological position that meaning is socially constructed through language. The study follows a qualitative approach. The qualitative research approach is an investigative research method that is used to seek understanding of opinions and motivations (Arghode, 2012). It provides insights into a research problem and helps develop hypotheses. The methodology of the study is also informed by the theory of the study that is the theory of onomasiology. The theory provides detailed steps in coining a term that the researcher has followed in creating neologism.

1.5.1. Research Methodology.

The research explores existing technical linguistics terms in NS from the undergraduate African Languages program searching for what has been done and what has not been done. It follows the steps provided by the theory of Onomasiology in analysing the practicality of the existing terms and neologisms. The theoretical framework presents four steps/methods to be used for analysing information. Firstly, is to observe the concept or phenomenon. With this step the researcher studied the term in order to note down the characteristics of the concept and how it relates to other concepts around it. Secondly, is to assign the concept a speech value. Through studying how and where the concept manifest, the speech value also called a term is assigned based on its relation to other concepts. Thirdly, is to check the practicality of the term given in the second step. This steps check that the term has relation to others. Lastly, is to check whether the neologism bears the same characteristics as its foreign equivalent. As such the researcher studied the etymology of the source term in order to determine whether the term bears the characteristics of the concept fully.

1.5.2. Sampling.

The data was sampled following a purposive sampling strategy. Purposive sampling method is used within qualitative research method to identify and select information-rich data that provides the researcher with effective use of data (Patton, 2005). The researcher selected data from a range of sources in the source language that would be able to contribute to the research. The benefit of purposive sampling is that it relies more on the researcher's prior knowledge about the purpose of their study for a proper choice of data. The scope of the data is purposefully selected based on how it appears thematically in the course material for undergraduate studies. The inclusion and exclusion of terms was based on what was not part

of the syllabus of undergraduate. The study utilised a homogenous purposive sampling technique that involves the selection of data based on shared characteristics.

1.5.3. Data collection.

The source data of this research was harvested from the undergraduate programme that is, from first year to third year syllabus of African Languages at the University of the Witwatersrand and includes terms from English linguistic dictionaries. The Linguistic terms comprises of 163 phonetics and phonology terms provided in English. These terms are mined based on how they are thematically taught in the undergraduate programme, as such the terms are harvested per concept in a logical flow.

The equivalents of the data in NS were harvested from NS grammar books, Terminology and Orthography No.4, 1988 and academic journals. T&O, No.4 is a revised edition written by the NS language Committee of the South African minority government. Though due to the fact that phonetics and phonology are not taught in Sepedi, the equivalents are searched haphazardly across the above-mentioned sources

1.5.4. Data Analysis.

The data was analyzed following a thematic analysis approach. As a method of analyzing qualitative data, thematic analysis provides steps that allow the researcher room for flexibility and arrangement of the data analysis. The approach provides three steps in analyzing the data, first to familiarize oneself with the data, within the study the researcher used this step to account for the data, looking at the total number of terms and where they were found along what was not found. The second step of the analysis is coding, within the study the data was coded based on how the concepts appear in the undergraduate syllabus.

The third step of thematic analysis is that of creating codes. The researcher did not have to create themes as the concepts appeared thematically in the undergraduate course material. Fourthly, to review the themes created to ensure that themes are a true representation of the data. The research had to search for terms outside the course material that are verbally taught and not presented in the material in order to ensure that a theme is fully represented. The last step provided by the approach is to write up, a step accounted for by the steps of the theory in section 3.3. of the methodology chapter. The approach was used due to its relatedness with the steps of term creation provided by the theory (cf.1.4). The study followed an inductive approach of the thematic analysis, allowing the data to create the themes.

1.6. Glossary.

The equivalents found on the data bases together with the neologism are put together to develop the glossary. The macrostructure of the glossary follows the requirements of the macrostructure of a Language for special purpose dictionary (LSPD). It presents two components, comment on form and comment on semantics. Comment on semantics falls under microstructure while comment on form falls under macrostructure. The LSPD presents fewer entries than that of a General purpose dictionary (GPD). A GPD entry would include the phonetic, morphological and the grammatical information. The LSP may have the phonetic markings though this is not always the case. For the purpose of this study the entry will have the headword, part of speech, gloss, definition and examples where necessary. The glossary of this study is arranged alphabetically.

1.7. Tools to be used.

There are many tools out there for the development of dictionaries/glossaries such as *Tswanelex*, *toolbox*, *Lexique pro* and *FLex* to state a few. This research paper uses the *FLex* programme to develop its term bank. It uses *FLex* because *FLex* unlike *Tswanelex* is a freeware while *Tswanelex* is licensed. The reason it does not use *toolbox* and *Lexique Pro* is that the two softwares' have been improved and incorporated within *FLex*. Fieldworks Language Explorer is an information management program that encourages the chronicle and examination of phonetic and anthropological information. It is an open source desktop application intended to help field linguists perform numerous regular assignments (Rogers, 2010).

Fieldworks Language Explorer 3.0 is a software for sorting out and investigating semantic information and it is available for free download by SIL International (SIL). *FLex* is the lexical and text tools component of SIL FieldWorks. It can assist one with recording and oversee lexical data, arrange and trade lexicons, interlinearize texts, analyse discourse features, study morphology, gather and sort out social and different notes and through this product, exact dictionaries/glossaries can without much of a stretch be sent out send/get which underpins remote coordinated effort (Rogers, 2010). Fieldworks Language Explorer is used within this study to develop the source terms and their equivalents to be found into a glossary.

1.8. Synopsis of Sections.

This section provides a brief summary of what each chapter of this research will entail. This research consists of five chapters in total, an introductory chapter, the literature review, the

theoretical framework, the research results and lastly the concluding and recommendation chapter. A description of what each chapter will entail is given in 4.1. to 4.5. Below.

1.8.1. Chapter 1: Introduction.

The first chapter introduces the research with the rationale. It gives a brief background of the study, the aim, the objectives and research questions. It looks at the role of theory in the study. It further provides the reader with a brief summary of what some of the chapters will be discussing.

1.8.2. Chapter 2: Literature Review.

The second chapter consist of the literature of the research, it gives a brief description of the field of the study and its progressions to date in contrast to its related field. It further goes into detail about what each field focuses on. It then reviews papers written on the need for development of terminologies in Higher Education and the works done thus far. Lastly reviews how developing terminologies for African language in Higher Education will contribute to the development of the languages.

1.8.3. Chapter 3: Methodology.

The third chapter discusses the Theoretical framework of the study, it provides a brief discussion on the theory used within the field of the research in contrast to its relating field. It gives details on how both theories function. Further gives the rationale behind the theory used for the study. This chapter also includes the methodology of the study which is informed by the theory. It gives details on how the research is carried out, and a brief discussion on the data collocation and scope alongside the tools used in the research.

1.8.4. Chapter 4: Research Findings.

This chapter gives a detailed analysis of the research results. It gives a numerical analysis of the data dealt with and an onomasiological analysis of the concepts. Numerically it shows how many terms the study harvested, how many equivalents were found through research, how many were not found and how many were found in what source. It further analysis the terms found for their rebuttal or approval, and suggest neologisms for terms not found using onomasiology.

1.8.5. Chapter 5: Conclusion.

The last chapter of the research presents a summary of the study. It gives the findings of the research in reference to the objectives. The conclusions drawn from the results of the research. Finally, the chapter presents the implications, limitations, challenges, and future works of the research.

Chapter 2: Literature Review.

2.1. Introduction.

This chapter presents a detailed mapping of the body of knowledge within terminology and terminography as reference to the study of linguistic terminology development in NS. It first gives a brief account of the history of modern terminology and terminography. Further differentiates terminography and lexicography in detail with the goal to show how the study fit within the field of terminography and looks at the different term formation processes that are used within the field. The study looks at theories utilised within the field of terminology development with the aim to justify the chosen theory applied in the study. It maps the beginning and growth of terminography in South Africa. The study looks at Terminography pre-1994 and post-1994 and the challenges the field faces in order to account for the current status of terminology today. This involves a track of terminological works that were established by the government and private institutions and their progress. Lastly, it gives a detailed justification for the need of terminology in higher education in order to outline the gap of the study.

2.2. The history of modern Terminology and Terminography.

2.2.1. The origin of modern Terminology/ Terminography.

Cambo (2013) states that the roots of modern terminology can be traced back to the 1930's in Australia with the work of Australian engineer Eugen Wuster. Wuster described terminology as a linguistic and pragmatic profession that provides comparison between concepts and terms of special language. In his doctoral dissertation as pointed out by (Castellví, 1999), Wuster introduced arguments for systematizing working strategies in

terminology, to develop various standards for managing terms and delineated the most major purpose of a philosophy for handling terminological data. Wüster (1985) contended that terminology is a tool that can be utilised to expel equivocalness from logical and specialised correspondence. His interest in the theory of terminology developed at a later stage, and though his work has been received in both positive and negative ways, many scholars have dealt in one way or another with (Wüster,1985) work, especially the general theory of terminology (Cambo, 2013). The interaction with his work lead to new kinds of theory approaches to terminology observed on works of scholars such as (Cabr ,2002) and (Gaudin, 2003). Hence one can argue that his work in terminology forms a focal point for international terminological works.

The field of terminology took off with the development of mainframe computers that provided databanks for the storage of terms. Terminology as a tool for modernization of languages came to be evident (Castellvi, 1999). Nedobity (1990) documented the introduction of computers to terminology development and states that terminologists were equipped with tools and resources that made their terminological works simpler and more effective. These included the development of databanks that facilitated the processing of terminological data. Terminology at the time was facing arguments from scholars who viewed it as a field on its own and others such as (Sager, 1998), who regarded terminology as a subfield of lexicology. This created a blur in terms of the definition of terminology and its practice (Castellvi, 1999). At the time of Wuster's work within terminology, the field of terminography was referred to as terminological lexicography. The term terminography was presented in 1975 in the ISO 1087 standard to supplant the terms terminological lexicography and special lexicography. It appears, in any case, that terminography should not be only a short structure for terminological lexicography. The term terminography was coined on the analogy of

lexicology: lexicography: terminology: terminography. The essential point of this term was to stress that it should only deal with the description of the general vocabulary, whereas the description of terminology should be accounted for by another discipline (Kudashev, 2007).

2.2.2. Terminography VS Lexicography.

Terminography is defined as a field of study involving the compilation of scientific language terminological glossaries (Kudashev, 2007). Terminology is the investigation of scientific language terms within a specific subject matter (Kageura, 2015). Similarly, lexicography is concerned with the compilation of glossaries, though lexicography exclusively compiles glossaries of the general language (Alberts, 2001). Whereas lexicology is the investigation of words in the general language. Though, over the years terminography has been categorised as a subfield of lexicography, scholars such as (Alberts,2001) and (Nkomo,2010) have come to define terminology as a field on its own. Alberts argues that terminography is a field on its own because lexicography is solely concerned with general language while terminology is concerned with disciplines, special fields and domains (2001). A reputation the field has kept to date.

Alberts argues that the distinction between the two professions is that while terminography is prescriptive, lexicography is descriptive in its nature (2001). The function of terminography is to create strong relationship between concept and designations by prescribing what designations should be used and how they should be used (Alberts, 2001). Hence the core element of terminography is the concept, terminological work is headed by the formation of the concept (Alberts, 1999). The concept within terminography is represented by a term (Cabr , 1998). The lexicon of lexicography is not confined to a specific style or register they are nearer to the expectation of the common user; thus the essential element lexicography is the word (Alberts, 2001).

The difference between a term and a word is that the term is a regular symbol that stands for a specific idea in a specific field, whereas a word represents ideas within the general language (Khan, 2016). Hence, terms are unambiguous in nature and are stored in terminological dictionaries, also referred to as Language Specific Dictionaries (LSP) while a word can have different meanings and are stored in General Language Dictionaries (GPD) (Bergenholtz, & Tarp, 2010). Example in North Sotho:

In a GPD: **Leina** /N/, a name of a person, place or object. '*leina la gagwe ke Lethabo*'

In a LSP: **Mmadiphethane**, a simple device for for figuring, comprising of an edge with columns of wires or furrows along which facial hair are slid.

Leina 'name' is a general word used in general language to refer to everyday life while *mmadiphathane* is a mathematical instrument used within the field of mathematics. The basic element of an LSP is that it is compiled to meet the needs of specialists in a particular field while GPD are compiled to meet the needs of the ordinary reader (Mihindou, 2004). Hence, *mmadiphathane* would be used more within the field of mathematics by specialist of the field than in general language.

This is due to the fact that it is compiling and coining terms for concepts within a special field of linguistics. The terminological list is meant for specialists and learners who are in the field of linguistics. The study uses terminology creation methods to coin the terms that are not found through research. The compilations of the special terms are stored in a glossary form following both the macro and the microstructure of an LSP dictionary.

2.3. Term Formation Processes.

The idea of origination and acquaintance of a new concept to a language inescapably includes the assignment of a term to represent it. Although each new term introduced to a language

to represent a concept is always called a neologism. A neologism is defined as a new term used to refer to a new concept to a language. These new terms can either be multi-word, single-word, complex terms or simple terms that are created through word formation processes such as borrowing, compounding or derivation. Therefore, new terms coined through borrowing cannot be called a neologism (Valeontis, & Mantzari, 2006).

Terms that cannot be referred to as neologisms include new multi word terms that are compounded using single word terms that already exist within the language. Although (Valeontis & Mantzari, 2006) argue that the definition of a neologism cannot exclude borrowed words, since borrowed words from other languages still follow the morphological properties of the target language when adapted into language. Hence, (Valeontis, & Mantzari, 2006) define neologism as:

A neologism is any new single-word lexical unit – simple or complex – which is formed and used for the first time in a language, and it can be the product of the combination either of existing linguistic elements from the same language or of linguistic elements from the same language together with borrowed elements from other languages or with older forms from the same language.

This study adopts (Valeontis & Mantzari, 2006)'s definition of a neologism to coin new terms adopted into the NS language.

Terminology development draws from two sources, borrowing from other languages referred to as the source language and internal word formation process in the language. Though, in both sources the creation of the new term is highly depended on the morphological properties of the internal language (Mtintsilana & Morris, 1988). Term creation sourced from the internal language involve the following processes:

1. **Derivation** – is a term formation processes that forms new terms from existing stems.

This is done through the addition of an affix to the stem (Valeontis, & Mantzari, 2006).

e.g. **English:** deliver + *-ance* = deliverance, modern + *-ise* = modernise

In NS a morpheme is affixed to a word and that changes the category of the word, eg.

N + locative suffixes = adverb, i.e. *noka + ing = nokeng* ‘at the river’.

2. **Compounding** - is a term creation process that involves the creation of compound lexemes. Compounds can be complex terms, phrases or blends (Valeontis, & Mantzari, 2006). e.g.

English – tea + spoon = teaspoon, **biological** + **electronic** = bionic

Northern Sotho – lešala + padi = lešalapadi ‘quantitative noun’, lešala + šupi = lešalašupi ‘demonstrative noun’

Terms can also be obtained from external languages. Borrowing is defined as a term creation process that involves borrowing the term from a source language, into the target language (Panocová, 2015). e.g.

English – piano - [Italian] ‘pianoforte’, yoghurt - [Turkish] ‘yoğurt’

Northern Sotho – terene [English] ‘train’, tafola [Afrikaans] ‘tafel’

As stated before the study will utilise the above word formation processes to coin the neologisms. Terms found through research will be studied using the Onomasiology theory for their approval or rebuttal to avoid inconsistencies in how the concepts are coined.

2.3.1. Translation Strategies used in terminology development.

Technical translation is defined as translation of text that belongs to a particular technical field or specialised field (Nchabeleng, 2012). Alberts, (1999) argues that in a multilingual

setting the documentation of technical translations requires the documentation of the terms in the source language followed by the provision of the equivalent in the target language. This means that a translation equivalent is an equivalent of the source term in the target language (Mojapelo, 2018). There are various ways of providing the translation equivalent in the target language such as transliteration, synonym, borrowing and paraphrasing.

Sager, (1990) defines transliteration as the process of borrowing from other languages but changing the morphological characteristics, pronunciation and spelling of the term to fit the target language. For example:

English	Sepedi
Amino acid	<i>aminoesiti</i>
Casino	<i>khasino</i>

Though, transliteration changes the term to fit the morphological characteristics of the language to the extent that the term is absorbed into the vocabulary of the target language and develops the vocabulary it is not a favourable strategy. Scholars such as (Alberts, 1999) and (Mtintsilana & Morris, 1988) argue that transliteration loses the character of the language and should be used as a last resort towards terminology development. Hence, transliteration in this research will be utilised after the previously mentioned term creation method have ran short in providing an accurate equivalent for a new concept.

In multilingual context such as South Africa where the source language is mainly English, terminographers face historical, social and economic difference in terminology development. Synonym becomes an alternative strategy to coining a translation equivalent. According to (Mojapelo, 2018) a synonym is words or phrases that belong to the same language that have similar or the same language. There are two types of synonyms which are total synonym and partial synonym. Mothiba (2012) defines total synonyms as synonyms that share the same

meaning to the extent that the words can be used interchangeably in every context. For example, in NS:

Dimonamonane 'sweets'

Malekere 'sweets'

Lekganyane (2006) defines partial synonyms as words or phrases that have similar meaning but differ in different contexts. The partial synonyms cannot be used interchangeably within a sentence. Example of such synonyms in NS is:

botse 'beautiful' and bose 'nice'

Though, translation through synonyms keeps the character of the target language without adoption of characteristics of other languages it presence ambiguity to words. The key element of special terms for specific fields is that they are unambiguous in their nature. Like transliteration the process of coining neologism through synonyms in this research will be applied as a last resort.

2.4. Theory of terminology.

The field of dictionary/glossary compilation is related to two theories, semasiology and onomasiology. The theory of semasiology is a theory of lexicology that deals with words and phrases and the concepts that they represent. Semasiology considers the isolated word and the way its meanings are manifested. The theory on Semasiology is best suited for lexicography. As such it will not be dealt with in detail, this study concerns itself with the theory of onomasiology because it's more suited to terminology. Onomasiology is a theory of

terminology that deals with concepts and/or phenomena and the terms that represent them, in particular contrasting terms for similar concepts in a lexicon (Grzega, 2005).

The theory looks at the designations of a particular concept, that is, at a multiplicity of expressions which form a whole. Onomasiology studies the terms and understand the concepts by relating to other concepts before giving terms their actual terms. According to Onomasiology a term must have the conceptual, linguistic, pragmatic and foreign specifications (Grzega, 2005). The aims of this study are three-fold, first is to find equivalents for the terms in the target language; to coin new terms where there are no equivalents and to develop a glossary for these equivalents. This study uses the Onomasiological approach because it offers an analytical tool with its goal of finding words that depicts given concept.

2.4.1. The onomasiological model.

The onomasiological model distinguishes word formation process as an autonomous element of linguistics. The model is a representation of three crucial sets of relations between the concept/object that needs to be named, the speech community and the word formation processes (Panocová, 2015). The model places emphasis on an element most ignored by most word formation processes, that naming of an object/concept is dependent on the needs of the speech community. Though, no word formation theories can be said to respond to the interest of the considerable number of speakers of a language. Hence the notion of a speech community may or may not reach a wider range of the speakers.

According to (Štekauer, 2005) the model eliminates the risk of terms being rejected by the speakers as it puts emphasis on the users of the language when coining new concepts and not necessarily on theories. The model is maintained by (Koch, 2006)'s notion of the onomasiological viewpoint that places importance on the speaker as a linguistic innovator (2006). Hence the model suggests a thorough investigation of concepts that are related to

the one to be coined in order to be able to assign a term to the new concept. Fernández-Domínguez (2019) argues that this negates the process of naming an intellectual one relying on cognitive capacity of the coiner to study existing relations between the concepts.

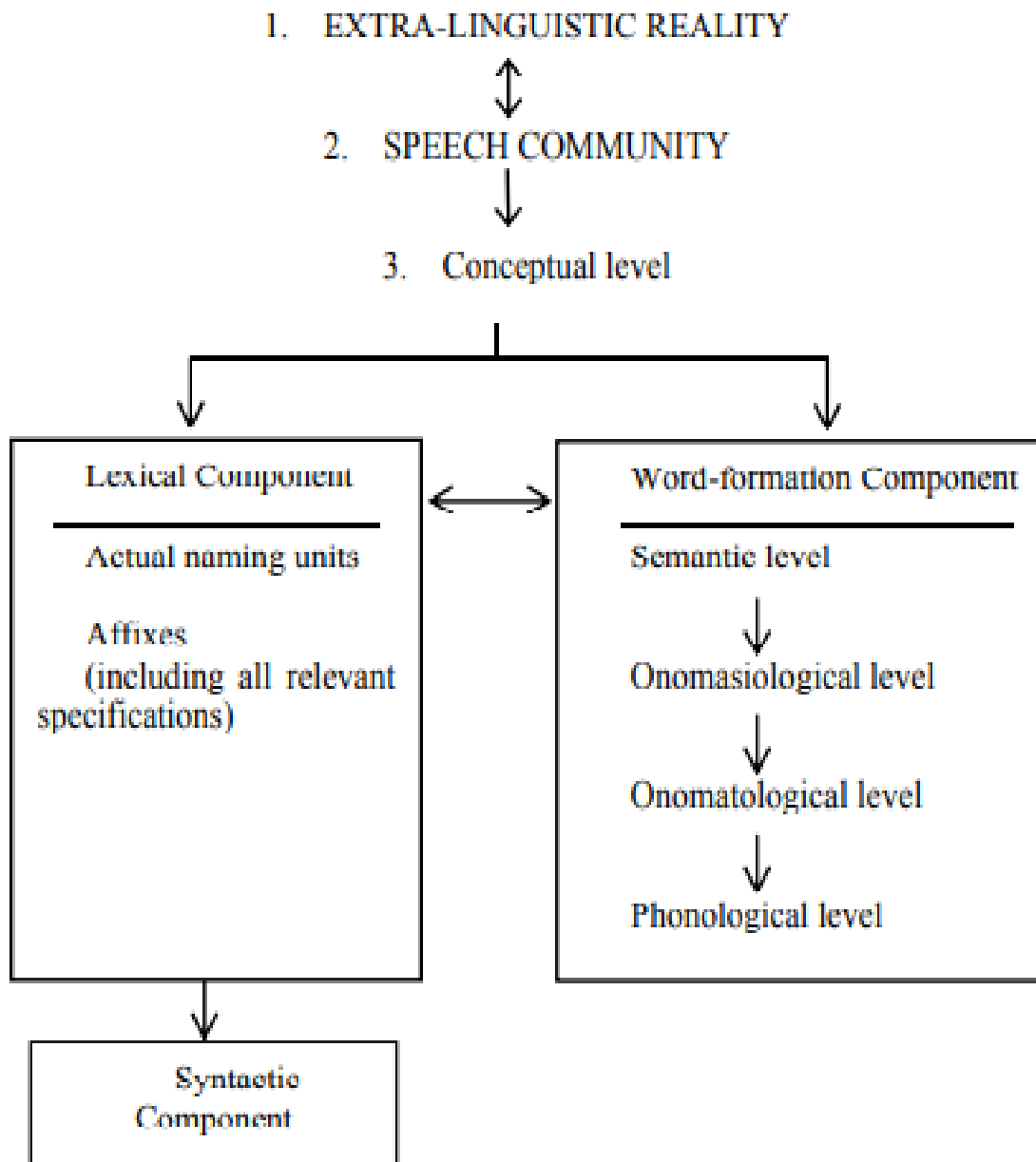


Figure 3. Štekauer's onomasiological theory of word formation (Panocová, 2015:16).

Štekauer's onomasiological theory of word formation will be followed to coin equivalents of terms not found and check the validity of those found through research.

2.5. Terminography in South Africa.

The documentation of colonialism over the years has been focused on the economic utilization of the land of the native people and the force used to achieve the latter. Though, these factors are important over the years they came to shadow the impact of colonialism on the cultural and linguistic practises (Alberts, 1999). The cultural and linguistic practices of the colonisers established superiority over non-European languages and cultures (Mtintsilana & Morris, 1988).

Today in post colonialism, with the gain of political independence the decolonisation of European cultural and linguistic practices still remains a challenge. Though, a fight has been progressing that attempts to remove the stigma from non-European cultural and linguistic practices and questions the acknowledged European prevalence. By examining the frontier business as usual, the earlier colonized people expect to make sense of how to situate themselves in association to their recent colonizers and others, comparably undermining, powers, for instance, globalization.

One of the principle battlegrounds for this is in education. The education system was established during the colonial stage, it was developed on European frontier models and to this point in time, keeps on executing to a progressively noticeable or a lesser degree a noteworthy number of the pioneer's etymological and social methodologies and is in this manner instrumental in supporting colonial discourse (Engelbrecht et.al, 2010). The government and private institution have been in the forefront of trying to fight these historical impediments.

2.5.1. The beginning of the development.

The development of the field within indigenous African languages has been impeded by the above historical factors that build the ideological and educational regression. Terminology development pre-1994 has been concentrated on the development of Afrikaans to bring it to the level of English even though the British never accepted it to be (Antia, 2015). Before 1994 the government's language promotion stipulated that the development of African Languages was not its responsibility but that of the national states a self-governing region. Hence the development of African languages terminology began with the supports from homeland government (Alberts, 2000).

The development of terminology in African languages began in 1928 with the establishment of the language committee. As stated before, the committee was principally financed by the homeland government and had agents from the legislature as members. The committee had boards for every African Language at provincial levels. The boards hired terminologists to develop terms for different fields to systematise and standardise. This resulted in terminology development in fields such as The South African Defence Force (SADF), The South African Broadcasting Corporation (SABC), the South African Bureau of Standards and others (Alberts, 2000). In 1971 a Coordinating Terminology Board (CONTERM) was created to synchronise the terms put together by the various offices. Later CONTERM merged with the Vaktaalbuuro of the SAAWK to establish a new Terminology Bureau that was called National Terminology Services (NTS). NTS amalgamated with the State Language Services of The Department of Arts, Culture, Science and Technology DACST in 1998 and became National Language Services (NLS) (Alberts, 2000:236).

According to Beukes (2004) the NLS started research work on indigenous languages word-formations methods and creating multilingual technical glossaries in the various South African

Languages. Since then, terminology in various fields of South African Languages were developed. This included multilingual terminology for fields such as Biology, Zoology, Physics, Weather Terms, Basic Health, Indigenous Birds, Commercial and Financial terms, Administration, Election terminology and others. The NLS became the basic foundation of knowledge for all the language at a local, provincial and national level but more so for scientific and technical communication. Later, NLS began work with the Pan South African Language Board (PANSALB), a self-governing legislative body appointed by the Senate in March 1996 (Alberts, 2000).

In 1999 the PANSALB Act was reconsidered to include the foundation and the board of national lexicography units of the various official languages. The terminology part of the Bureau creates terminology mainly from a source language (Beukes, 2004). Due to its vast terminology development the source language of the terminologist was mainly the English Language (Alberts, 1999). When it came to coining of neologisms, the terminologist consulted linguists and subject specialists. Since 2000 terminologist of the NLS consult the language bodies established by PANSALB (Alberts, 2000). These boards have seen the development of terminologies in scientific fields that prove to be useful today. Though even in the present time after democracy and the many initiatives taken both by the private and the government sector, the field of terminology and terminography still faces challenges that impede their impact of language development.

2.5.2. Challenges of Terminology development today.

Even after the various efforts to develop the terminology of the indigenous languages, terminology development in South Africa still faces challenges. Alberts (2010) argues that amongst others terminology development in South Africa is impacted by the low or non-existent dictionary culture of the speakers of the indigenous African Languages. Nkomo

stipulates that amongst the challenges that face indigenous Language terminology development is the issue of language policies and theoretical problems (2010).

According to (Nkomo, 2010), indigenous African Languages are under unfavourable conditions when it comes to their development because governments assign restricted roles to them. There is a lack of allocation of necessary resources to promote the languages in the restricted domains, as a result these results in ideologies that suggest that the languages are inadequate to communicate special knowledge. The lack of allocation of resources has also been a handicap to the implementation of the country's multilingual language policy. Despite the language policy challenge many scholars on individual and institutional level have undertaken several projects to develop the terminology of the indigenous languages (Nkomo, 2010).

Though, (Nkomo, 2010), argues that the scholars also face theoretical problems when it comes to the development of the terminologies. Many face various challenges of calling their products LSP Dictionaries as they are limited in range and information, while taking into consideration that there has been many criticisms of dictionaries and numerous noted advantages of glossaries. Though, the difference between the two is not clear, many scholars have argued that the difference is of no practical use as the major area of confluence is amongst themselves (Nkomo, 2010).

As stated before, the domination of English is still a stigma the country battles with. The conceived language attitudes promoting the domination of English within both the speech community and the education system at large, have proven to influence the marginalisation of the indigenous African languages within these realms. In a country like South Africa that considers itself to be democratic and the creation of language policies is governed on the concept of democracy these attitudes tend to have fundamental implications. As a result, the

English linguistic hegemony impacts and affects many higher power decisions with regard to the development of the indigenous languages (Dalvit, Murray, & Terzoli, 2009). Though this has lost momentum over the years, it had dire impacts on the minds of the speakers of the indigenous languages. It has produced first language speakers of English who are non-whites, with a low regard for the languages. Hence even with the support from those in power for the development of the languages. The courses offered towards this development lack the students.

Over the year scholars have investigated ways to overcome the challenges facing African languages terminology development. Alberts (2014) notes that though there has been work done at institutions and government boards, these works are done in isolations and often do not reach standardization point. She proposes that publishing houses, private initiatives, terminology and tertiary institutions work together to coordinate terminology that they are currently working on. Alberts also suggested a terminographical model that could be followed by the above institutions to address the matter, putting more attention on terminology training and development by tertiary institutions themselves (2014).

2.6. The need for terminology development in higher education.

Alberts (2011) notes that the need to develop terminologies for African languages is not to elevate it to the status of English though the long-written vocabulary is enhanced by creating terminology in African languages to express new scientific terms. The development of this vocabulary will enhance the work of writers, teachers, learners, linguists and media practitioners. The assimilation and transfer of effective scientific, economic and technological knowledge along with the communication skills of laypeople and subject specialists can be exceptionally evolved through using the right terminology (Alberts, 2010). Hence the

development of terminologies is an essential action towards the advancement of the languages and their users (Alberts, 2010).

As stated before, there has been terminological works in South Africa within indigenous languages through institutions such as PANSALB. This has seen the development of LSP dictionaries in hard science fields such as Physics, Maths, archeology and others (Mawela, 2007). The developments of terminological works include the various glossaries developed by the Department of Arts and culture in Limpopo for health and Medical (Mojapelo, 2018). This was through the established Language Research and Development Centre (LRDC) which's main function was to coordinate terminological works that was monitored by the NLS. The LRDC established at a provincial level language unit that were required to develop terms that were verified by the NLS.

However, terminology development in higher education still remains inadequate, as a result communicating scientific language in these languages still remain a challenge (Msimang, 2000). As such teaching in most higher educations is still carried out in English, with emphasis placed on the teaching of the indigenous South African languages. Teaching in the indigenous South African languages has been taken on by a few universities such as University of KwaZulu Natal (UKZN), Sol Plaatje University, Tshwane University of Technology (TUT) and Rhodes University.

Many scholars have written about the intellectualization and modernization of indigenous African languages to develop and be used in more restricted domains. Msimang, (2000) wrote about the need for special terms in moving towards and guaranteeing productivity in teaching indigenous languages in their own media and the development/modernisation of the languages. He notes that although there are confinements to instructing the grammar of African languages in their own media, there is an agreement on the critical need for

terminology development that fills the gaps within standardization processes. Msimang also notes that newly developed terminology does receive criticisms in terms of their legitimacy and speakers viewing them as being imposed upon them (2000). Bearing in mind the above, he argues that the criticisms are invalid as they do not consider the fact that the linguistic impact of terminologies' rebuttal or acceptance is based solely on the speakers. In accordance to this, Madiba (2001) suggests a pragmatic approach for the development of terminology that proposes borrowing as a respected approach because it increments the chance of acceptance by speakers.

Though, despite borrowing decreasing the chances of refusal of terms from speakers, this study uses term formation prescribed by the theory of onomasiology to form neologisms and only borrows when concepts stand alone and cannot be studied in relation to others. This is because when the neologisms formed represent the concept to its fullest it leaves little room to be refused by the speakers. Taking into consideration what is currently amiss in the development of indigenous South African languages, which is the terminology to teach these languages in their own media in higher education. This study aims to develop a glossary of linguistic terms for higher education syllabus in NS with the hope to facilitate teaching and learning in higher education.

Educators within higher education teach and describe concepts and phenomenon that are foreign to their students. The concepts and phenomena that are taught within lecture rooms are usually defined in books and course materials. Though the definitions provided within these materials are normally provided in English. Therefore, terminology development in higher education could be beneficial to students through the production of bilingual and multilingual term lists. As such students registered for language related courses would be enabled with the ability to process concepts in their own languages. For other courses

information retrieval would be made easier. Though these students may write their formal work in English they would have had gained understanding of the concepts (Alberts, 2014).

At present, there are a few higher institutions that have embarked on developing multilingual polythematic terminology in postgraduate studies. These include the work of universities such as Stellenbosch University which produces terminographical work within their language centre. The unit of isiXhosa in the language centre has a few trilingual Xhosa-English-Afrikaans term lists. These terminological lists include works such as the generic administrative lists, departments, lists of faculties, etc. In 2009, Rhodes University began working on multilingual terminological data for various specific subjects. This resulted in the production of Xhosa-English term lists that in turn enhanced the teaching of isiXhosa. The development of the terms also laid a foundation for research by postgraduate students in Xhosa (Alberts, 2014).

The initiatives towards multilingualism also include the Bachelor of Education Honours Modules offered in isiZulu as a medium of teaching and learning in 2012 at the University of KwaZulu-Natal (Mgqwashu, 2013). One major development with regard to indigenous languages and higher education involves the full dual-medium BA degree in Contemporary English Language Studies (CELS) and Multilingual Studies (MUST) that was established in 2013 by the University of Limpopo. The MUST programme uses NS as both a medium of instruction and learning, whereas the CELS uses English for both learning and teaching (Ramani, & Joseph, 2002). The efforts towards terminology development include "Some of the strands in work being carried out in UWC's Department of Linguistics challenge prevailing disciplinary orthodoxies and, paradoxically, question the contemporary relevance of the institution's language policy responses to the protests of the early years" (Antia, 2015. P.579).

2.7. Conclusion.

The availability of specialised Northern Sotho glossaries within higher education will offer the possibility of moving from an education system that is mainly on remediating the limitations of the students' English and will promote the use of students' language and knowledge in higher education. The vocabulary on NS is expanded through the development of neologisms in the field of linguistics following word-formation theories such as Onomasiology mentioned in section 2.4.

Chapter 3: Research Methodology.

3.1. Introduction.

This chapter presents the research paradigm, approach and design of the study. It presents an account of the different methods used within research with the aim to position the study within the chosen research approach. The study further looks at the interconnection between the chosen research design and the philosophical assumptions of the author and methods. The study presents the types of data generation techniques and the sampling method that was utilised in the study. It looks at the ethical requirements of conducting research and how the study met them and discusses reflexivity in qualitative research in relation to the study. Furthermore, it looks at the tools utilised in the production and analysis of the data. The chapter provides a discussion on the concept of validity and reliability within qualitative research method and how the study met the requirements of the two concepts.

3.2. Research Paradigm, Approach and Design.

Research paradigm is an approach or research model of conducting research. A paradigm is defined as a worldview or a set of assumptions about reality (Krauss, 2005). There are different types of research models such as positivist, constructivist and pragmatist. Therefore, the philosophical assumptions underlying this research study is that of constructivist/interpretive tradition. This implies a transactional epistemology and the ontological position that meaning is socially constructed through language. The study was guided by the following research questions:

- a) How will the terms be collected and stored?
- b) What are the equivalents of the harvested terms?
- c) What theories will be used to develop and analyze the neologisms?

This study aimed to develop a glossary of linguistics terms in NS for higher education in order to facilitate teaching and learning. This study explores NS linguistics data from different sources looking at what has been done and has not been done. It did not aim at providing the ultimate strategy towards moving teaching African languages in their own media but rather to investigate one of the steps that could be taken to reach this goal. The decision of what research approach to use within a study is dependent amongst other things on the philosophical assumptions of the researcher (Creswell, & Creswell, 2017).

The selection of a research method is also determined by the nature of the research problem being dealt with and the audience of the study. Creswell & Creswell (2017), argue that research design and research methods are crucial to research as they represent the perspective of the research which gives details in a successive way from broad constructions of research to the narrow procedures of methods. The study aimed to use a mixed method research design. Though through analysis of the data, aspects of quantitative research method were minimal to the extent that the researcher decided it was not relevant to the study. Hence the study follows a qualitative research design with its aim of analysing data in order to gain knowledge about the topic on hand.

The method is relevant to the study due to its nature of analysing existing data in order to derive knowledge. The study analyses existing terms to derive knowledge about the nomenclature of NS, in order to coin neologisms. A qualitative approach was also useful to the study as it provided different methods of coining terms and how terminology development is carried out. Thematic analysis was used to provide a classification of the terms looking at what terms were found where and which were not found and to provide a thematic interpretation of the terms.

3.3. Research Method.

The research explores existing technical linguistics terms in NS from the undergraduate African Languages program searching for terms that have been coined and what has not been developed. The method of the study is provided by the theory employed, i.e. the theory onomasiology. The theory of onomasiology is theory of word-formation process that is concerned with concept and/or phenomena and the terms that represent them, in particular contrasting terms for similar concepts in a lexicon (cf. section 2.2 of chapter 2). The theoretical framework presents four steps/methods to be used for analysing information that the researcher followed in the following manner. Firstly, is to observe the concept or phenomenon. To note and understand what the concept is, where the concept manifest itself and to note the characteristics of the concept and how it relates to other concepts around it.

For example, the term:

Acoustic phonetics

The term manifest itself in the field of linguistics, it is a subfield of the broader field that is phonetics. As such the concept is related to terms such as auditory phonetics and articulatory phonetics. The terms acoustics phonetics, auditory phonetics and articulatory phonetics are related in the sense that they are all subfield of the broader field of Phonetics.

Secondly, is to assign the concept a speech value. This speech value is also called a term and it is assigned based on its relation to other concepts. The suggested speech value of the term studied above in NS is:

***Thutokemo ya medumo* ‘acoustic phonetics’.**

The phrase is made of the compound word *thutokemo* ‘study of the state’, that is made of the word *thuto* ‘study’ and *kemo* ‘state’ analysed below respectively. The phonological analysis of the word *thuto*:

Given verb	<i>ruta</i> 'teach' → <i>thuto</i> 'study'
Deverbalise [/-a/ → /-o/]	<i>ruto</i>
Assign noun class 9 prefix	<i>nruto</i>
Assimilation [/-r-/ → /-th-/]	<i>nthuto</i>
Underspecify [/n-/]	<i>thuto</i>

The derivation of the word *kemo* 'state' is given below:

Given verb.	<i>ema</i> 'stand' → <i>kemo</i> 'state'
Deverbalise [/-a/ → /-o/]	<i>emo</i>
Epenthesisise [/k-/]	<i>kemo</i>

The phrase *thutokemo ya medumo* is also made of the possessive concord *ya* 'of' and the word *medumo* 'sounds'.

Thirdly, is to check the practicality of the term given in the second step. These steps check that the term has relation to others.

The phrase *thutokemo ya medumo* 'acoustic phonetics' is related to concepts that are subfields of *thutomedumo* 'phonetics' such as the concept *thutokutlo ya medumo* 'auditory phonetics' and *thutopolelo ya medumo* 'articulatory phonetics'. The concepts maintain their relationship by having the same internal structure in the equivalents. They are made of [*thuto* 'study' + what kind of study it is + possessive concord *ya* 'of' + *medumo* 'sounds']. The equivalents only differ in terms of what kind of study they are but maintain their relationship to the broader concept through maintaining the words that appear in it *thuto ya medumo*.

Lastly, is to check whether the neologism bears the same characteristics as its foreign equivalent.

Though, the etymology of the word acoustics points to hearing, the study of acoustics phonetics studies the qualities of speech waves heard by the listener. As such the equivalent

kemo refers to the state of the sounds. The phrase *thutokemo ya medumo* is a true representation of the concept as it is directly translated as the study of the state of sounds.

The above steps provided by the theory are applied to the originate data and neologisms for their confirmation or rebuttal. The first step is to search for the linguistic terms in African languages undergraduate course material that is from first to third year and linguistic dictionaries, secondly to find the equivalents in the target language for the data, and in this case, NS. The equivalents will be searched from several types of dictionaries. They will also be mined from NS grammar books, academic journals, and finally from the Terminology and Orthography No.4, 1988. T&O, No.4 is a revised edition written by the NS language Committee of the South African minority government. Terms included in T&O No.4, edition are intended in the first place for the use in the primary school and have mainly been taken from the syllabus for the various subjects of the basic education phase, though many terms in the edition are used in Higher Education too.

NS equivalents are noted and studied following the onomasiology steps to investigate the accuracy of the terms in the analysis. Where research draws blank neologism are formed to establish nomenclature. The onomasiology steps mentioned above are followed again to form the neologisms. Concepts are studied in terms of their relation to others and are given a linguistic form. The linguistic form is checked if its practical based on the nomenclature of concepts that relate to it. Lastly, etymology of the source term is studied in order to check if the linguistic form assigned represents the concept it stands for.

The equivalents found on the data bases together with the neologism are put together to develop a term bank (LSP). The macrostructure of an LSPD dictionary has the same ordering of that of a GPD. It presents two components, comment on form and comment on semantics. Comment on semantics falls under microstructure while comment on form falls under

macrostructure. The LSPD presents fewer entries than that of a GPD. A GPD entry would include the phonetic, morphological and the grammatical information. The LSP may have the phonetic markings though this is not always the case. For the purpose of this study the entry will have the headword only. The LSP glossary of this study will be arranged alphabetically e.g.

Tlogelo. *N.* Elision. The omission of a sound or syllable when speaking. [*e.g. bona + mobona = mmona, i.e. mb =mm*]

Tumankong. *N.* Nasal. Sounds that are produced with the velum lowered and blocking airflow into the oral cavity. [*e.g. n – naga ‘land’, /ng/ - ngwana ‘child’, /n/ -nko ‘nose’*]

Melao ya popamedumo. *N.* Phonological rules. A formal way of expressing phonological processes of a language. [*e.g. Khuetsano ‘assimilation’, ruta ‘teach’ → thuto ‘education’ where /r/ assimilates to be more like the noun class /n/ and in turn changes to /th/.*]

3.4. Sampling.

The study used purposive sampling method to select the data. The researcher selected data from a range of sources in the source language that would be able to contribute to the research. Purposive sampling method is used within qualitative research method to identify and select information-rich data that provides the researcher with effective use of data (Patton, 2005). An example of this is within the theme of acoustics phonetics. The field of acoustics phonetics is not taught in detail within the undergraduate syllabus, though readings are assigned it is not an area of concentration. As a result, the researcher had to choose terms in the field that are introduced such as the term *setšeaseswantšho* ‘spectrograph’ and *seswantšho sa medumo* ‘spectrogram’.

One of the advantages of purposive sampling is that it relies more on the researcher's prior knowledge about the purpose of their study for a proper choice of data. The scope of the data is purposefully selected based on how it appears thematically in the course material for undergraduate studies. Due to the aim of the study that is to produce a comprehensive phonetics and phonology glossary for higher education, the data was also collected from linguistics dictionaries for terms not covered within the course materials. The inclusion of terms relied more on the researcher's knowledge of the field and what was taught in the field of phonology and phonetics in the undergraduate program. As such the exclusion of terms was based on what was not part of the syllabus of undergraduate such as terms that appear in advanced linguistics. The study utilised a homogenous purposive sampling technique. Homogenous sampling involves the selection of data based on shared characteristics.

Within qualitative research, the exact number of data cannot be resolved earlier the investigation. As such the research data is informed by the degree to which the exploration question has been tended to (Macleod, 2002). When the research data arrives at a point of immersion, for example at a point where new themes stop developing, the collection of data can be concluded (Macleod, 2002). Taking into consideration the aim of the study that is to develop phonological and phonetics terms for higher education, terms were chosen based on the basis that they are fall under the two fields. Data was collected up to the point where themes in the field no longer appeared, the data ended up at 163 across both fields.

3.5. Ethical Consideration.

Taking into consideration the significance of ethics in the process of conducting research along the challenges around conducting research, higher institutions put forth an admirable attempt to secure the nobility and wellbeing of research participants (Silverman, 2013). Due

to the nature of this study there was no need to acquire ethical clearance certificate. Irwin (2013) state that the use of secondary data involves the use of data that is openly accessible on the internet, books and other public forums, authorization for additional utilisation is therefore implied.

This study did not require ethical clearance as it made use of data that was freely available through books, internet and public forums. The use of secondary data within this study also did not contain identifying information of participants or information that could lead linked to identifying participants. The source data of this research that is in the English language was collected through secondary data along some of the target data in NS, though data that was not found in the target language was generated, it was through the study of the secondary data and did not involve any human participants in their production.

3.6. Data collection.

The source data of this research was collected through secondary data. The data was harvested from English linguistic dictionaries and also includes terms that cover the syllabus of linguistics terms in African Languages department in the faculty of humanities at the University of the Witwatersrand for undergraduate programme, that is, from first year to third year. The Linguistic terms comprises of 163 phonetics and phonology terms mined in English. These terms are mined based on how they are thematically taught in the undergraduate programme, as such the terms are harvested per concept in a logical flow.

The equivalentents of the data in NS was harvested from NS grammar books, T&O, No.4, 1988 and academic journals such as Zerbian (2007) and Madigoe (2003). Though due to the fact that phonetics and phonology are not taught in Sepedi, the equivalentents are searched haphazardly across the above-mentioned sources.

3.6.1. Secondary Data.

Hox & Boeije (2005) characterizes secondary data as data that was initially compiled for various purposes that is then reused to address another research question. There are several advantages of using secondary data such as the fact that it is time convenient as the data exist in the format you need. One of the reasons for using secondary data in the source language is because NS linguistics has been studied and taught in higher education, hence the concepts exist in English. Secondary data is under many circumstances processed by experts of that particular field. This creates room for better analysis of the data. The data of this study has been compiled and analysed by linguists, this makes the development of neologisms easier as this process requires an in-depth study of the concept before it is coined.

Secondary data provides the researcher with more ways of looking at the problem at hand as it allows for realizations of patterns one would have not looked for. It also eliminates the chances of improper sampling and observer bias. The use of secondary data in this study ensured accurate sampling of the data, though the researcher was familiar with the subject at hand the secondary data gave a chronological flow of the terms ensuring that no terms were left out. The field of phonetics and phonology was not developed in a short period but developed over a long period of time. As such the use of secondary data allows the researcher rich data that was collected over time that they might not have had.

3.7. Reflexivity in qualitative research.

Within qualitative research the researcher is considered to have a vital role towards the collection of data and the analysis of it (Berger, 2015). The process of research is carried out by subjective individuals and as such the subjectivity of the individual should be recognized (Parker, 1994). Furthermore, when the subjectivity of the researcher is acknowledged it

makes it possible for the researcher to be able to identify the reasons or justifications that led to them conducting the research problem that they are investigating. This is due to the fact that the viewpoint of the researcher along their background and perceptions have a high probability of influencing the way they collect and analyse data (Berger, 2015).

The researcher in this research project is a master's student in the department of African languages who has her own experiences regarding being taught African languages in English. The researcher was introduced to the field of Phonetics and Phonology from the second year of her degree. This semester long course was conducted in English language where many conversations with fellow students and course coordinators about the need to develop the scientific vocabulary of the course into the different African languages were had. Through intense reading on the subject, the researcher is aware that moving towards African languages in their own media will not happen over-night but will be a process that is made up of different efforts. Though what is clear is it not an impossible task to embark on.

Reflexivity within research enables the researcher to have a deeper comprehension of the meaning of the phenomenon they are investigating (McCabe, & Holmes, 2009). As such this allows the researcher the ability to draw from their own background and experience in conducting research which in turn enables them to get a better understanding of their data. Although the viewpoint and experiences of the researcher play a fundamental role in the research, what remains fundamental is the interpretation of the data. Therefore, in interpreting the data it is crucial that the researcher is able to put aside their viewpoint of the subject in investigation and be able to realise patterns the data shows. Though the rationale of this study is substantiated by the viewpoints of experts in the field, it is still important that

the researcher continuously reflect on her subjectivity in the process and stay focused on the interpretation of the data.

3.8. Data Analysis.

The study used a thematic content analysis. Thematic content analysis is a method of analysing qualitative data. It is utilised in the study because it allows the researcher a lot of flexibility in interpreting the data and the arrangement of the terms into themes allowed for a more efficient analysis of the large amount of terms (Anderson, 2007). The approach is also used due to its relatedness to the steps provided by the theory applied in the study. Thematic analysis is made of two approaches that is the inductive and deductive approach. An inductive approach includes permitting the data to determine the themes while deductive includes preconceived themes depended on theory or existing information (Anderson, 2007). The study followed an inductive approach to the analysis of the data, allowing the terms to create the themes.

For example, terms that fall under the concept of organs of speech such as the ‘palate’ *magalagapa*, ‘uvula’ *lelengwana*, ‘tongue’ *leleme* etc, would be harvested before the concept of place of articulation that is which organ touches which organ for the production of speech sounds. Example of this concept in the data of the research is given below:

English Term	NS Equivalent
Assimilation	khuetšano
Elision	Tlogelo
Epenthesis	tsentšo ya ditumanoši
Substitution	Kemelo
Derivation	matšo

The above table lists terms that fall under the broader concept of phonological processes. As such they would be under the theme 'phonological processes'. This is not a theme chosen by the researcher but one that the data naturally fall under by the nature of them being changes in the phonology of languages.

Thematic analysis provides steps into the analysis of the research data. The first step is to familiarize oneself with the data. This step within the research was used to give an overview of the data looking at how many terms were found in the English language and where they were found from along how many equivalents of the terms were found in NS and how many were not found. This also involved an account of where the NS terms were found. The second step of the approach is coding, this involves the arrangement of the data in a way that is convenient to the researcher. The data of the study was arranged according to how the concepts appear in the undergraduate programme in their English form such as organs of speech, airstream mechanism, voicing etc. Though due to the relatedness of the concepts in linguistics the terms had a logical flow of themes, hence the researcher did not need to arrange the terms into themes.

The third step of the approach is creating codes, this step studies the terms to realise patterns and create themes. Due to the fact that the terms in English are extracted from the undergraduate syllabus, the terms appear thematically, and the NS terms are also analysed thematically following the source language. The fourth step involves reviewing the themes created, this is to ensure that the themes are a true representation of the data. This step within the study involved a search of terms outside of the course materials as they excluded other concepts that students are meant to self-study. This was to ensure that the terms are complete and follow a logical thematic arrangement. The final step of the approach is writing

up, this involves a clear account of the methods of data collection and term creation that was provided by the theory in section 3.3.

3.9. Tools used.

There are many tools out there for the development of dictionaries/glossaries such as *Tswanalex*, *toolbox*, *Lexique pro* and Fieldworks Language Explorer (FLEX) to state a few. This research paper uses the FLEX programme to develop its term bank. It uses FLEX because FLEX unlike *Tswanalex* is a freeware while *Tswanalex* is licensed. The reason it does not use *toolbox* and *Lexique Pro* is that the two softwares have been improved and incorporated within FLEX. Fieldworks Language Explorer is Fieldworks Language Explorer is an information management program that encourages the chronicle and examination of phonetic and anthropological information. It is an open source desktop application intended to help field linguists perform numerous regular assignments (Rogers, 2010).

Fieldworks Language Explorer 3.0 is software for sorting out and investigating semantic information and it is available for free download by SIL International (SIL). *FLEX* is the lexical and text tools component of SIL FieldWorks. It can assist you with recording and oversee lexical data, arrange and trade lexicons, interlinearize texts, analyse discourse features, study morphology, gather and sort out social and different notes and through this product, exact dictionaries/glossaries can without much of a stretch be sent out send/get which underpins remote coordinated effort (Rogers, 2010). FLEX is used within this study to develop the source terms and their equivalents to be found into a glossary.

3.10. Validity and reliability in qualitative research.

3.10.1. Denzin and Lincoln (2005) argue that qualitative research focuses more on the degree of which the outcomes are steady after some time (reliability) and whether the examination really measure what it proposed to quantify (validity). As such qualitative research places importance on the exactness of the data and the degree to which the data can be generalised. Qualitative research questions the possibility of generalizability of results and argues that meaning is logically organized, as such two individuals cannot experience the same problem similarly. Within qualitative research there is a variety of data and results that cannot be generalised across various settings (Denzin and Lincoln, 2005).

Within qualitative research reference is made to different systems that can be utilised to assess and improve the nature of qualitative research. One distinctive feature of qualitative research is that it outlines the idea of reflexivity that has been mentioned in detail in section 3.7 and gives a clear account of the researcher's subjectivity towards the process of conducting research (Martinez, 2017). Reflexivity in qualitative research also involves the acknowledgement from the researcher that their experiences and viewpoint had an influence on the conception of the research. As such a description of the researcher experiences in relation to the topic allows them to give a clear foundation and context that the research is grounded upon.

Koch (2006) states that the trustworthiness of the process of conducting research also lies in the degree of which the research gives detailed information and the procedure by which the results has been come to. As such the validity of qualitative research is based on the extent to which the researcher can give adequate data that will make it possible for the reader to derive meaning from. Ultimately, validation highly relies on the researcher's transparency about the procedure of collecting data and the analysis of it. This methodology chapter

presents greater details about the research methodology, data collection and analysis processes in line with the requirement of validity in the process of conducting research.

3.10.1. Ensuring Validity in the study.

Shurink (2003) and Gibbs (2002) argue that validity in relation to qualitative research method is a construct that quantifies how much the meaning got from the exploration information is legitimate and successfully capture the theme being referred to. As such validity in qualitative research requires consistent checking and rechecking of the data to the extent that the data analysis is self-correcting (Gibbs, 2002). Validity also depends on the researcher's ability to "identify when to continue, stop or modify the research process" (Morse et.al, 2002:17). Due to the fact that the data of this study was searched from different sources, such as course books and dictionaries the researcher paid attention to the process of data collection and analysis in order to note any repetition of terms and terms that did not necessarily belong in the field of phonetics and Phonology. This process was helpful in guiding the researcher about when to end or continue with data collection along the analysis.

3.10.2. Reliability in qualitative research.

Gibbs (2002) states that reliability in qualitative research measures the extent to which the findings of the research can remain the same across different repeated investigations with different researchers together with the generalizability of the results. Due to the fact that this research makes use of secondary data, reliability is pre-established. However, the NS terms include primary data as a result of equivalents not found through research. The reliability of the primary data was established through the theory utilised in the study. The theory gives clear steps/methods of term creation, discussed in detail in section 3.3 that ensures that terms are formulated in the correct manner. The theory was helpful in coining terms through

a thorough study of the word formation processes of NS, the nomenclature of the language made it possible to obtain the internal structures of related concepts and coining of the terms more convenient. Example of this is illustrated by the concept of *sethong sa puo* ‘place of articulation’ in NS, list of related concepts is given below:

English term	NS Equivalent
Velar	Tumatlalongwala
Uvular	Tumalelengwaneng
Glottal	Tumakgokgokgo
Alveolar	Tumarinini

The concepts above illustrate that concepts related to *sethong sa puo* ‘place of articulation’ have the following internal structure [voice + organ of speech]. As such the terms in NS are made of the word *tuma* ‘sound’ and *setho sa puo* ‘organ of speech’. Though internal structures were helpful in coining concepts, not all related concepts had the same internal structure. The researcher experienced a lot of challenges with concepts that did not have the same internal structure. The formulation of these terms had to rely of the knowledge of NS vocabulary of the researcher and translation strategies.

An example of such terms is that of the movement of the tongue during vowel articulation: *phetogo ya godimo* ‘vertical modification’ and *bogodimo bja leleme* ‘tongue height’. The two concepts are related in the sense that they are both a manner of tongue movement during vowel articulation but are not related typological, both in the source language and the target language. Hence the translation was depended on the study of the etymology of each word, such as the etymology of the word ‘vertical’ that is from Latin word *verticalis* ‘directly overhead’ the equivalent of the term relied on the NS vocabulary of the researcher of what is something that is overhead and that is *godimo*.

3.11. Conclusion.

This chapter outlined how the research was conducted, illustrated the process used to select the data of the study, the research method followed as well as the approach that was used in analysing the data. Though the data aimed to follow a mixed method design, the quantitative aspects of the data were too minimal to include. The research data was sampled through a purposive sampling strategy, where rich data that aligned with the study was chosen purposively. The research method was guided by the theory of onomasiology that provided the steps mentioned in section 3.3 in the creation and confirmation of terms. Due to the fact that the study uses secondary data, validity and reliability is pre-established. The data analysis was presented following a thematic analysis where the data was accounted for numerically and analysed thematically. The terms were presented alphabetically in a glossary form.

Chapter 4: Findings.

4.1. Introduction.

This chapter presents an analyses the data of the research. The analysis covers concepts in the field of Phonetics and Phonology from African Languages undergraduate syllabus at Wits and linguistics dictionaries. The data is accounted for in data management looking at what number of terms were found in the source language, the target language and what number of terms were not found in the target language. The data is analyzed chronologically based on how the concepts appear in academic course books for undergraduates. Terms that were found through research were presented while terms that were coined by the author were proposed. Taking into consideration the aim of the study is to develop a glossary of Linguistics terms in NS, the research looks at the strategies applied to create the glossary and presents the created glossary. Finally, this chapter presents the results of the research and conclusions reached through data analysis.

4.2. Data Management.

The total number of terms collected in the source language (English) amounted to 163. These were found through course books, phonology and phonetics textbooks and linguistic dictionaries. Out of the 163 terms found in the source language 63 were found through research in the target language (NS). While from the 163 terms found in the source language, 5% were found in Phonetics and Phonology textbooks, while 85% was found in undergraduate course books and 10% in linguistic dictionaries. The 63 terms found in the target language, 24 terms were found in the government T&O, No.4 taking into consideration the fact that the terms in T&O, No.4 are not arranged by any field of study, mining the terms proved to be a

challenge. 16 of the terms were found in NS Grammar books while 8 of the terms were found in general dictionaries.

4.3. Theoretical analysis.

The following analysis follows the Onomasiological steps provided in chapter 2 to analyze the legitimacy of the equivalents found and to generate neologisms. The analysis is done chronologically looking at processes and concepts that occur in phonetics and phonology. The first step suggested by the theory is to study the concept that a term represent, and in doing so one is able to realise patterns such as what word formation processes are utilised within a language. Hence the study uses word formation processes that are found in NS along other translation strategies in the formation of the terms not found. Terms found through research are given and terms coined by the researcher are proposed.

4.3.1. Phonetics.

4.3.1.1. Introduction

Phonetics is the study and classification of human speech as a physical phenomenon (Davenport & Hannahs, 2013). The etymology of the English term is from the Late Latin word *phōnein* 'speak'. Hence phonetics is the study of the sounds produced when one speaks. The concept in NS is called ***Thutomedumo***, the term is coined through compounding. It is a compound of *thuto* 'study' and *medumo* 'sounds'. The word *thuto* is derived from the verb *ruta* that means to teach, a phonological process of how the word is derived is given below:

Given Verb	ruta → thuto
Deverbalise /-a ->-o/	ruto
Assign Noun class 9 prefix	nruto
Assimilation /r->th/	nthuto
Underspecify /n/	thuto

The second compound of the word *medumo* is a plural form of the word *modumo* that means sounds. The term *thutomedumo* encapsulates the meaning of the concept that is the study of sounds. The concept of phonetics is further divided into three subcategories that is acoustic phonetic, auditory phonetics and articulatory phonetics.

4.3.1.2. Acoustic phonetics.

The term **acoustic phonetics** is defined as the investigation of the physical properties of speech and means to break down sound wave flags that happen inside speech through changing frequencies, amplitudes and terms dependent on how they are seen (Davenport & Hannahs, 2013). The etymology of the word acoustic is from the Greek word *akouein* 'hear'. The recommended term for acoustics phonetics in NS is ***Thutokemo ya medumo***, the equivalent is a phrase that encompasses of a compound. The word *thutokemo* is a compound of the word *thuto* analysed above and the word *kemo* 'state'. The word *kemo* is derived from the verb *ema* that means to stand. A phonological analysis is provided below:

Given Vern	ema → kemo
Deverbalise /-a to -o/	emo
Ephentheseize /k-/	kemo

Though the etymology of the word acoustics points to hearing, the study of acoustics phonetics studies the qualities of the speech waves heard by the listener, hence the equivalent *kemo* refers to the state of the sounds. As such the term *thutokemo ya medumo* is a true representation of the concept as it is directly translated as the study of the state of

sounds. The phrase is made of the compound analysed, a possessive concord *ya* 'of' and the word *medumo* 'sounds' that is the core morpheme of the concept.

The field of acoustic phonology was greatly enhanced by the creation of a machine called a spectrograph. **Spectrograph** is a device used to measure and analyse the energy of waves (Ball & Rahilly, 2014). The suggested term for the concept in NS is **Setšeaseswantšho sa medumo**, the phrase is made of the compound *setšeaseswantšho* 'something that takes a picture', *sa* 'of', and *medumo* 'sounds'. The compound word of the phrase is made of the word *setšea* 'something that takes' that is derived from the verb *tšea* 'take' and *seswantšho* 'picture'. A phonological analysis of the former is given below:

Given Verb	tšea 'take' → setšea 'something that takes'
Assign noun class 7 prefix	setšea

A similar process is applied in the coinage of the word *seswantšho* 'picture' that is derived from the verb *swantšha* 'compare/impression'. An illustration of the processes is given below:

Given Verb	swantšha 'compare' → seswantšho 'picture'
Deverbalise [-a-> -o]	swantšho
Assign noun class 7 prefix	seswantšho

The phrase **Setšeaseswantšho sa medumo** encapsulates the concept of a tool that is used to take pictures of the sound waves.

The energy wave captured by the spectrograph is converted into a spectrogram. A **spectrogram** is a photo displaying properties of time, frequency and intensity of the speech sound (Ball & Rahilly, 2014). As such the proposed term for a spectrogram in NS is **Seswantšho sa medumo**, the phrase is made of the word *seswantšho* 'photo' analysed above, *sa* 'of', and *medumo* 'sounds'. The term encapsulates the meaning of the concepts of a spectrogram as a photo of the properties of sounds.

4.3.1.3. Auditory Phonetics.

The concept **auditory phonetics** is the study of the perceived speech sounds (Davenport & Hannahs, 2013). The etymology of the word auditory is from the Greek word *audire* 'hear'. The suggested term for auditory phonetics in NS is ***Thutokutlo ya medumo***. The word *thutokutlo* is a compound of the word *thuto* 'study' (cf 4.3.1.) and the word *kutlo* 'something heard'. The word *kutlo* is derived from the verb *kwa* that means to 'hear'. A phonological analysis of the word is given below:

Given Verb	kwa 'hear' → kutlo 'something heard'
Deverbalise [-a -> -o]	kwo
Assimilation [-w- -> -u-]	kuo
Epenthesis [-tl-]	kutlo

The term encapsulates the concept of the study of sounds and hearing. The field of auditory phonetics is concerned with speech perception, as such at a physical level it studies the anatomy of the ear and its functions. While at a cognitive level it studies the intelligibility of speech sounds.

4.3.1.4. Articulatory Phonetics.

The last concept of phonetics is that of **articulatory phonetics** that is defined as the study of articulation and ways that humans produce speech (Roach, 2010). The etymology of the word articulatory is from the Latin word *articulus* 'small connecting part'. The proposed term in NS is the phrase ***Thutopolelo ya medumo*** that contains a compound like the previously mentioned concepts. The word *thutopolelo* is a compound of the word *thuto* 'study and *polelo* 'speech'. The term *thutopolelo ya medumo* captures the concept of the study of speech production. It is made of the analysed compound, a possessive concord *ya* 'of' and the word

medumo 'sounds' that is the core concepts of phonetics. The basic unit of articulatory phonetics is a phone. A **phone** is any distinct speech sound. The term in NS is referred to as **Modumo** 'sound'.

4.3.1.5. Vocal organs.

The concept of *thutopolelo ya medumo* 'articulatory phonetics' is further divided into other sub-concepts such as the **vocal organs**. Vocal organs are organs that take part in the production of speech sounds, the term is a phrase made of two terms that is vocal and organs (Rogers, 2014). The etymology of the word vocal is from the Latin word *voc* meaning 'voice', while the etymology of the word organ is from the Greek word *organon* 'tool, instrument'. The suggested term for this concept in NS is **Ditho tša medumo**. The word *ditho* exist within the general language as body organ, hence the equivalent is a phrase conjoint by the possessive concord *tša* 'of' and *medumo* 'sounds'. The term represents the meaning of the concept that is organs that are involved in speech production. The table below is a list of vocal organs and their recommended equivalents.

Term	Equivalent
Lungs	Maswafo
Glottis	Lešobakgokgokgo
Larynx	Kodu
Pharynx	<i>Mogolonthago</i>
Uvula	Lelengwana
Velum	<i>Legalagapa le boleta</i>
Palate	Magalagapa
Alveolar ridge	<i>Kutupele legalagapeng</i>
Teeth	Meno
Lips	Pounama
Tongue	Leleme
Blade	<i>Mathomo a leleme</i>
Tip	<i>Ntlha ya leleme</i>
Back of the tongue	<i>Morago ga leleme</i>
Medial	<i>Lelemegare</i>
Root	<i>Kutu ya leleme</i>
Vocal fold	<i>Mara a medumo</i>

Table 1. Ditho tša medumo ‘vocal organs’.

It is important to note that the above organs have a primary physiological function and speech production is a secondary function. As such most of the terms exist in the language and some are recommended. Sounds that exist include the teeth, for example, are used to break down food before entering the digestive system. The tongue is used to taste and swallow food, while the lips closes the mouth and the velum allows for breathing through the nose or mouth. As a result, the terms of *ditho tša medumo* ‘vocal organs’ would be found in the general language and differentiated from them being terms by the different functions they hold as linguistics terms. The term **leleme** ‘tongue’, for example is considered the most active articulator as most sounds are produced with the tongue touching another speech organ. The secondary functions of the term **meno** ‘teeth’ is to help with pronunciation.

The **pharynx** is defined as the part of the throat behind the mouth and nasal cavity, and above the larynx (Rogers, 2014). The etymology of the term is from the Greek word *pharunx*

meaning the 'back of the throat'. The proposed term in NS is **Mogolonthago**, the term is a compound of the word *mogolo* which means the 'throat' and *nthago* meaning 'at the back'. The term encapsulates the concept of a pharynx as an organ at the back of the mouth. The **velum** also known as the soft palate is defined as the membrane at the back of the tongue (Rogers, 2014). The etymology of the word comes from the *velum* meaning 'covering'. The proposed equivalent in NS is **Legalagapa le boleta**, the term is translated into a phrase that encapsulates the meaning of a soft palate. It is made of the word *legalagapa* 'palate', a conjunction *le* 'that is' and the word *boleta* which means 'soft'. It is important to note that these are the organs of articulation hence they are nouns however the organs as places of articulation possess different but similar names.

The **alveolar ridge** is defined as the membrane behind the upper front teeth before the hard palate (Rogers, 2014). The etymology of the word alveolar comes from the Latin word *alveolus* 'small cavity' while the etymology of the word ridge is from the German word *rücken* 'back'. Hence it is the small cavity behind the teeth. The proposed equivalent in NS is **Kutupele legalagapeng**, the term is made of the compound *kutupele* and *legalagapeng*. The word *kutupele* is made of the word *kutu* which means a 'bump' and *pele* which means 'before, in front or ahead'. As such the term *kutupele legalagapeng* represents the concepts of a small cavity, although the English term refers to the back of the teeth the NS equivalent point to the front of the palate which is the same place.

Though the term **leleme 'tongue'** appears in the general language, different parts of the tongue are used to produce different sounds. The tongue is divided into the tip, blade medial, back and the root. The **tip of the tongue** is the end of the tongue translated into **Ntlha ya leleme**, *Ntlha* meaning 'tip'. The **blade of the tongue** is the beginning of the tongue translated

into ***Mathomo a leleme*** ‘blade of the tongue. The **medial** part of the tongue is the middle of the tongue, the suggested equivalent is ***Lelemegare***, the equivalent is a compound of the word *leleme* ‘tongue’ and the word *gare* ‘middle’. The **back of the tongue** is translated into ***Morago ga leleme***. Lastly the **root of the tongue**, the suggested term for the concept in NS is ***Kutu ya leleme***. The phrase is made of the word *kutu* ‘root’, the possessive concord *ya* ‘of’ and *leleme* ‘tongue’.

The last vocal organ analysed is that of the **vocal folds**. The vocal folds are two membranous tissues which extends inwards from the inside the larynx. The edges of the cords vibrate in the airstream to produce the voice (Rogers, 2014). The etymology of the word cords is from the Middle English word *accord* meaning musical instrument. The proposed NS equivalent is ***Mara a medumo***, the phrase is made of the word *mara* ‘membrane’ and *medumo* ‘sounds’. The phrase is a representation of the concept of the vocal fold as a membrane in the larynx that produce sounds. The graph below is a representation of *ditho tša medumo* ‘vocal organs’:

No.	Term	Equivalent
1	Mosela wa nko	Nasal cavity
2	Kutupele legagapeng	Alveolar ridge
3	Legagapa	Palate
4	Legagapa le bolete	Velum
5	Teeth	Meno
6	Lelengwana	Uvula
7	Melomo	Lips
8	Mogolonthago	Pharynx
9	Mafelo a leleme	Tip of the tongue
10	Mometšo	Epiglottis
11	Mathomo a leleme	Blade of the tongue
12	Mara a medumo	Vocal cords
13	Lelemegare	Medial
14	Lešobakgokgokgo	Glottis
15	Morago ga leleme	Back of the tongue
16	Kodu	Larynx
17	Moyakakgotso	Trachea

Table 2. *Ditho tša medumo 'vocal organs'.*

4.3.1.6. Airstream Mechanism.

The second concept of *thutopolelo ya medumo* 'articulatory phonetics' is the concept of direction of air or **airstream mechanism**. The airstream mechanism is the method by which airflow is created in the vocal tract (Davenport & Hannahs, 2013). The etymology of the word stream is from the Greek word *rhein* 'to flow', while the etymology of the word mechanism is from the Greek word *mēkhanē* 'contrivance' which means a 'procedure or processes'. The suggested equivalent in NS is the phrase ***Tsela ya moyakelelo***. The phrase is made of the word *tsela* 'route/procedure', a possessive concord *ya* 'of' and the compound word *moyakelelo* 'air flow'. The compound is made of the word *moya* 'air' and *kelelo* 'flow'. The phrase is a true representation of the concept of the ways in which air flows in the production of speech. There are two different ways in which air flows in the production of speech sounds that is the ingressive airstream and the egressive airstream.

The **ingressive airstream** is the flow of air by ingress into the vocal tract (Davenport & Hannahs, 2013). The term ingressive stems from the word ingress, the etymology of the word ingress is from the Latin verb *ingredi* meaning 'to enter'. Hence the term ingressive has reference to the air entering the lungs through the production of sounds. The proposed NS equivalent of the term is **Moyakelelogare**, the compound is made of the word *moya* 'air', *kelelo* 'flow' and *gare* 'inside'. The phrase represents the concept fully without any room for ambiguity. It is a representation of the flow of air into the lungs for the production of sounds. The second airstream is the **egressive airstream**, unlike ingressive it is the flow of air from the lungs to the exterior through production of sounds (Davenport & Hannahs, 2013). The term stems from the word egress, the etymology of the word is from the Latin verb *egressus* that means 'to go out'. The verb egress in the phrase has reference to the air going out through the production of sounds. The recommended equivalent in NS is the phrase **Moyakelelontle**, the compound is made of the air *moya*, *kelelo* 'flow' and the word *ntle* 'outside'. As such the phrase encapsulates the concept of airflow from the inside to the outside. The air flowing through both mechanisms depends on the constrictions and movement of the vocal organs to produce voice.

4.3.1.7. Voicing.

The concept **voice** or **voicing** is an articulatory process in which the vocal cords open or close in the production of voiced or voiceless sounds (Daniel, 2011). The etymology of the word voice is that of the Latin word *vox* that mean voice. The concept of voice in NS is referred to as **kodu**. As such **voiced sounds** are sounds that are produced with the vocal cords closed and vibration (Daniel, 2011). The suggested term for the concept in NS is **Tumakodu**, the term is a compound of the word *tuma* 'sound' and *kodu* 'voice'. The term encapsulates the concept

of sounds that are produced with voice. Sounds that are produced with the vocal cords open and not vibrating are called **voiceless sounds** (Daniel, 2011). The proposed equivalent for the term in NS is **Tumakodutu**, the compound is made of the word *tuma* 'sound', *kodu* 'voice' and *tu* 'low'. The equivalent represents the concept of sounds that have voice but lower than that of voiced sounds.

Another important aspect is that of the position of the velum. The Velum earlier defined as the soft palate determines whether sounds are nasal or oral, based on whether it is raised or lowered. **Nasal** sounds are sounds produced with the velum lowered and air flowing through the nose (Daniel, 2011). The term nasal is derived from the noun nose. The NS Equivalent for the term is **Tumankong**, the term is a compound following the nomenclature of terms in manner of articulation (cf, 4.6.). It is made of the word *tuma* 'sound' and the word *nkong* 'at the nose', *nkong* is derived from the word *nko* where the locative suffix 'ng' is suffixed to the core morpheme *nko*. Examples of nasal sounds in NS include [ng; n; m]. **Oral sounds** are sounds produced with a raised velum and air flowing through the mouth (Daniel, 2011). The etymology of the word oral is from the Latin word *os* 'mouth'. The suggested NS term is **Tumamolomong**, the term is a compound of the word *tuma* 'sound' and *molomong* 'at the mouth'. The word *molomong* is derived from the word *molomo* 'mouth' where the locative suffix was epenthesised to show it is a location. Examples of oral sounds include [p; l; s; z].

4.3.1.8. Place of Articulation.

The production of different sounds also depends on the different movement of the vocal organs. Different sounds are articulated at the different organs, this is referred to as places of articulation. **Place of articulation** is the point of contact in the vocal tract (Davenport & Hannahs, 2013). The etymology of the word articulation comes from the verb *articulare* 'utter

distinctly'. The proposed equivalent is ***Sethong sa puo***, the phrase is made of the word *sethong* derived from the noun *setho* 'organ' where the locative 'ng' was epenthesized to turn the word into a locative, *sa* 'of' as the possessive concord and the word *puo* meaning 'speech'. The phrase is a representation of the concept of the place where speech is produced. The vocal organs also called the articulators are made of the active and the passive articulators.

The **active articulators** are vocal organs that move through speech production (Davenport & Hannahs, 2013). The proposed equivalent is ***Dithotiro tša puo***, the phrase is made of the word *dithotiro* which is a compound of the plural word *ditho* 'organs' and *tiro* 'action', *tša* 'of', and *puo* that is 'speech'. The phrase *dithotiro tša puo* encapsulates the concept of organs that are active during the production of speech sounds. The **passive articulators** are the organs that do not move through the production of speech sounds (Davenport & Hannahs, 2013). The etymology of the word is from the Latin adjective *passivus* meaning acted on by an external agency. The suggested equivalent in NS is ***dithotirwa tša puo***, the phrase is made of the compound *dithotirwa* which is made of the word *ditho* 'organs' and *tirwa* 'passive', *tša* 'of', and the word *puo* 'speech'. The phrase is differentiated from the active articulators by the lack of the word *tiro* 'action' and the existence of the word *tirwa* 'passive' to show the lack of action performed by the passive articulators. Based on the previously analysed vocal organs, the active articulators are the tongue, lips, and the vocal fold all the others are passive articulators.

As noted before the vocal organs have physiological function before speech production. The organs as adjectives have different names. Hence sounds produced at the lips are called **labial sounds**. The etymology of the word labial comes from the Latin noun lip. Sounds produced at the lips in NS are called ***ditumapounameng, tumapounameng*** is singular. The term is a

compound of the word *tuma* 'sound' and *pounameng* that is derived from the word *pounama* 'lips' where the locative */-ng/* is suffixed to indicate at the lips. The term encapsulates the concepts of sounds that are produced at the lips. Examples *ditumapounameng* are [p; b; m]. Sounds produced with the teeth and lower lip called **Labiodentals** are called ***ditumapouinong, Tumapouinong***, the compound word is made of the word *dituma* 'sounds', *puo* that is the core morpheme of *pounama* 'lips' and *inong* 'at the tooth'. *Inong* comes from the noun *leino* 'tooth' where the prefix 'le' was removed and the suffix 'ng' was epenthesised in order to show that it is a locative. An example of *tumapouinong* is [f]. Sounds produced at the teeth are called **Dentals**. The term in NS is referred to as ***Ditumainong***. The compound word is made of the previously analysed words *ditho* 'organs' and *inong* 'at the teeth'. The data shows that the nomenclature of concepts related to place of articulation is that of compounding. The terms are compounds of the word *tuma* 'sounds' and the name or core morpheme of the vocal organ participation in the production of that sound.

4.3.1.9. Manner of Articulation.

The way the vocal organs approach each other when producing speech results in different ways in which the sounds are produced. This concept is called ***manner of articulation***, unlike place of articulation it is the structure based on how the organs approach one another. The etymology of the word *manner* is from the Latin word *manuarius* meaning 'of the hand'. The proposed equivalent of the term in NS is ***Mokgwa wa puo***, the phrase is made of the word *mokgwa* which means *manner*, *wa* 'of' and *puo* 'speech'. The phrase encapsulates the concept that is how the sounds are produced. There are various ways of articulation based on what organ is approaching which one. The table below is a list of the different manner of articulation with their equivalents:

Term	Equivalent
Stop	Tumakhutlo
Nasal	Tumankong
Fricative	Tumagwasa
Africatives	Tumagwasa
Liquid	Tumakelelo
Plosives	Tumathupa
Coronal	Tumatheko

Table 3. Equivalents of *Mokgwa wa puo* ‘manner of articulation’.

The analysis of the terms of manner of articulation is to establish the nomenclature of the terms based on the fact that the terms have been coined in the languages. Like the terms of the place of articulation, the above terms are formed through compounding. The terms are compounds of the sound ‘*tuma*’ and the manner of how the sound is produced. An example with the term *tumanko* ‘nasal’. The term is a compound of the core concept that is *tuma* ‘sound’ and how the sound is produced that is through the nose hence the term *nko* meaning nose and is a noun.

The different ways in which sounds are articulated are divided into four categories that is non-continuant, continuant, obstruents and sonorants. **Continuants** are sounds that are produced with no obstruction of the oral cavity (Rogers, 2014). The etymology of the term is from the Latin word *continuuus* that means ‘continuing’. The proposed equivalent for the term in NS is ***Dielelo***, the term is derived from the verb *elela* ‘to flow’. A phonological process of how the word was derived is given below;

Given verb	<i>elela</i> → Kelelo
Deverbalise /-a -> -o/	<i>elelo</i>
Assign noun class 10 prefix	<i>Dielelo</i>

The term represents the concept of sounds that flow without obstruction. As such sounds that flow with the obstruction of the oral cavity are called **non-continuant** (Rogers, 2014).

The proposed equivalent is *diemišo*, the term is derived from the verb *ema* ‘stop’. The term represents the concept of sounds that have obstruction. Examples of *diemišo* include stops and affricates.

Obstruents are sounds that are produced with partial obstruction of airflow (Rogers, 2014). The term is derived from the Latin word *obstruere* ‘blocking up’. The proposed term in NS is *ditswalelwano*, the term is derived from the verb *tswalela* ‘close’. A phonological process of how the term was derived is given below:

Given verb	tswalela → ditswalelwano
Dimunitise /-ana/	tswalela+ana
Labialization /-a- -> -w-/	tswalelwana
Deverbalise /-a -> -o/	tswalelwano
Assign noun class 10 prefix	ditswalelwano

The term is a representation of sounds that are produced with partial obstruction of air. Examples of *ditswalelwano* ‘obstruents’ are Non-nasal stops, fricatives, and affricates.

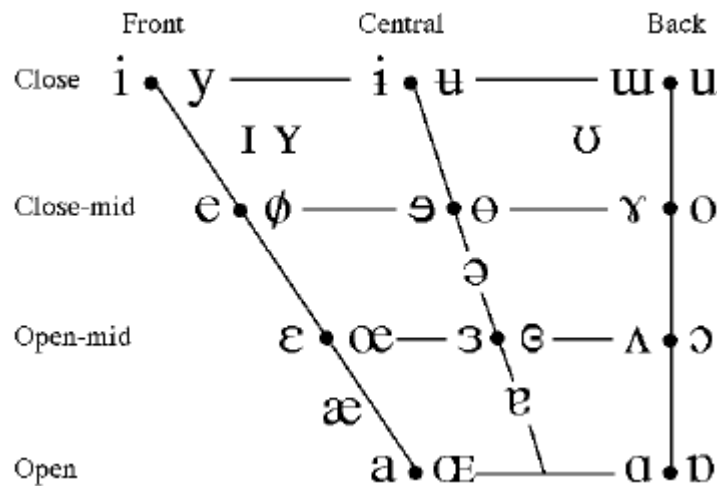
The last concept *sonorants* are sounds that are articulated with the air resonating in the oral or nasal cavity. The term is derived from the Latin word *sonor* meaning sound. The proposed term for the concept in NS is *Ditumotlalo* ‘sounds’. The term is a compound made of the word *ditumo* ‘sounds’ and *tlalo* ‘fullness’ that is derived from the word *tlala* ‘full’. Vowels within a segment are considered the most sonorant sounds.

4.3.1.10. Vowel Articulation.

The articulation of vowels is different from that of consonants, NS has seven vowels that is a, e, ê, i, o, ô and u. The articulation of the different vowels is depended on the movement of the tongue up and down, a concept known as **vertical modification** (House, 2013). The

etymology of the word vertical is from the Latin word *verticalis* ‘directly overhead’, the word modification is derived from the verb modify which means to change. The proposed term for the concept is ***phetogo ya godimothwii***, the phrase consists of the word *phetogo* that means ‘change’, the possessive concord *ya* ‘of’ and *godimothwii* ‘vertical’. The phrase encapsulates the meaning of the term as movement in the vertical direction. Vertical modification is expressed in terms of **tongue height**. The suggested equivalent of the term is ***bogodimo bja leleme***, the phrase is made of the term *bogodimo* derived from the word *godimo* ‘high’ through the epenthesis of the prefix *bo* the word became height, *bja* ‘of’ and *leleme* ‘tongue’. As such vowels are described in terms of whether they are articulated with the tongue ***godimo*** ‘high’, ***tlase*** ‘low’, ***godimogare*** ‘mid-high’ and ***garefase*** ‘mid-low’.

The articulation of vowels is also dependent on the **horizontal modification** of the tongue. Horizontal modification of the tongue is the forward and backward movement of the tongue, the word horizontal is derived from the word horizon (House, 2013). The proposed equivalent is ***rapamego bja leleme***, the phrase is made of the term *rapamego* ‘horizontal’, *bja* ‘of’, and *leleme* ‘tongue’. Horizontal modification is described based on whether the tongue is *pele* ‘forward’ or *morago* ‘backward’. Lastly, the articulation of vowels is based on the shape of the tongue when produced. The lips may spread resulting in the articulation of vowels with unrounded lips or they may be rounded. The concept of **unrounded vowels** is proposed to be ***tumanoši tše gašitšweng***, the phrase is made of the word *tumanoši* ‘vowel’, *tše* ‘which’, and *gašitšweng* ‘that is spread’ that is derived from the word *gaša* meaning ‘spread’. While the concept of **rounded vowels** is proposed to be ***kgokolo ya ditumanoši***, the phrase is made of the word *kgokolo* ‘round’, *ya* ‘of’, and *ditumanoši* ‘vowels’. The two concepts represent the concepts that entail horizontal modification. Below is a vowel chart that include NS Vowels.



https://upload.wikimedia.org/wikipedia/en/5/5a/IPA_vowel_chart_2005.png

Figure 4. IPA Chart of the NS vowels.

Vowels are also further classified into monophthongs, diphthongs, and triphthongs.

Monophthongs are vowels that has a single perceived auditory quality (House, 2013). The term is a compound of the word *mono* and *phthongs*. The etymologies of the words are from the Greek language, with *mono* meaning 'single' and the word *phthong* meaning 'sound'. The proposed equivalent in NS is **Tumanošitee**. The equivalent is a compound of three words that is *tuma* 'sound', *noši* 'alone', and *tee* meaning 'one'. The concept is a representation on the concept of a single vowel. The vowels mentioned above are all monophthong.

Diphthong is a sound formed by the combination of two vowels in a single syllable (House, 2013). The term is formed by prefixing *di* from the Greek language meaning 'twice' to the word *phthong* 'sound'. The proposed term for the concept in NS is **Tumanošipedi**, the equivalent is a compound of three words. It is a combination of the word *tuma* 'sound', *noši* 'alone' and *pedi* 'two'. The term represents the concept of two vowels that coexist within the same syllable. The last concept **triphthong** is that of sounds that are formed through a union of three vowels pronounced in one syllable (House, 2013). The term is formed by prefixing *tri* from the French language meaning 'three' to the word *phthong* 'sound'. The proposed

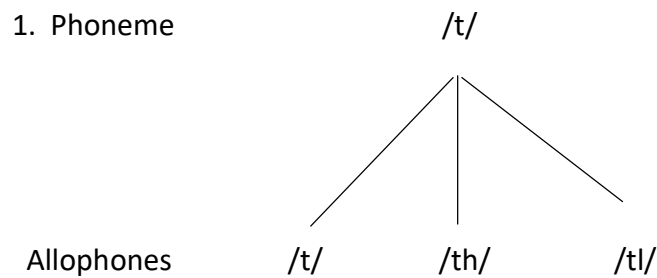
equivalent in NS is ***Tumanošitharo***, the equivalent is a compound of three words. It is a combination of the word *tuma* 'sound', *noši* 'alone' and *pedi* 'two'. The term represents the concept of two vowels that coexist within the same syllable. The above terms are made of the compound word *tumanoši* that means 'vowel', the compound is made of the words *tuma* 'sound' and *noši* 'alone'. As such the compound encapsulates the idea of a vowel as a sound that can stand alone.

4.3.2. Phonology.

The above analysis has looked at sounds as single unit. The study of how these sounds are used systematically to form words is called **Phonology** (Gussenhoven & Jacobs, 2017). The term phonology is a compound of the Greek words *phone* 'sound' and *logy* 'study'. The equivalent term of the concept in NS is called ***Thutopopamedumo***. The term is a compound of three words; *thuto* 'study', *popa* 'build' and *medumo* 'sounds'. The term is a true representation of the concept of the study of the patterning of sounds. The most basic unit of terminology is the phoneme. A **phoneme** is a sound, or various sounds that are perceived to have similar function by speakers of a language (Gussenhoven & Jacobs, 2017). The term is known as ***lebopamedumo***, the term is a compound of the word *lebopa* 'builder' derived from the verb *bopa* 'build' and *medumo* 'sounds'. The term encapsulates the concept of the building up of sounds.

The concept of a phoneme is made of set of multiple possible spoken sounds called **allophones** (Gussenhoven & Jacobs, 2017). The term is a compound of the word *allo* meaning different and the word *phones* 'sounds'. As such allophones are different sounds used to pronounce a single phoneme. The suggested equivalent for the term in NS is ***Medumofapano***, the term is a compound of the word *medumo* 'sounds' and *fapano* 'different'. The concept

represents the concept of different sounds that build up one phoneme. The illustration below is of an example of NS allophone:



The illustration shows that /t/, /th/ and /tl/ are different instances of the single phoneme /t/.

An important aspect of allophones is where in the word they appear within a phoneme.

Consider the words below:

/t/	/tl/	/th/
Taba ‘news’	Tlala ‘hunger’	Thaba ‘mountain’
Setena ‘progress’	Sekotlelo ‘dish’	Mathatha ‘problems’
Sebete ‘liver’	seatla ‘hand’	Borotheo ‘bread’

The data shows that the different allophones of /t/ can appear in the middle of a word, at the beginning, and the end of the word. Though the different allophones above cannot replace each other, meaning replacing one allophone with another would change or distort the meaning of the word. Sounds that appear in the same environment and replacing one sound with the other can change the meaning are said to be in **contrastive distribution** (Hayes, 2011). The suggested term for the concept in NS is **Abagano e fapanago**, the phrase is made of the term *abagano* ‘distribution’ derived from the verb *abagana* ‘distribute’, the conjunction *e* ‘that is’, and *fapanago* ‘different’. The phrase encapsulates the concept represented by the allophones listed above. The concept of **Minimal pairs** provides evidence that two phones are in contrastive distribution. Minimal pair is two words with the same number of sound segments, and which differ in segment only, and which have different

meanings (Hayes, 2011). The suggested term for the concept in NS is ***Dihlopha tše nyenyane***.

The phrase is made of the word dihlopha 'groups', tše 'that are', and nyenyane 'small'.

Allophones that can appear in the same environment and can replace one with the other without changing meaning are said to be in **free variation** (Hayes, 2011). The suggested term for the concept in NS is ***kabo e lokologilego***, the phrase is made of the word *kabo* 'distribution', conjunction *e* 'that is', and the word *lokologilego* 'free'. The phrase encapsulates the concept of different sounds that can appear in the same place of the phoneme freely without distorting the meaning of the word. When allophones appear in different parts of the phoneme they are said to be in **complementary distribution** (Hayes, 2011). The etymology of the word complementary is from Latin word *complementum* meaning complete. The equivalent of the term in NS is said to be ***Kabo ya tlaleletsano***, the phrase is made of the word *Kabo* 'distribution' that is derived from the verb *aba* 'distribute', a possessive concord *ya* 'of', and the word *tlaleletsano* 'to complement each other' derived from the verb *tlaleletso* 'compliment'. The phrase is a true representation of the concepts of allophones that appear in different environments.

4.3.2.1. Phonotactics.

The study of the rules governing the possible phoneme sequences in a language is called **Phonotactics** (Gussenhoven & Jacobs, 2017). The term is a compound of the word *phono* derived from the Greek words *phone* 'sound' and *tactics* from *tacticos* 'having to do with arranging'. The suggested term for the concept in NS is ***Thutopopadinoko***, the term is a compound of the word *thuto* 'study', *popa* 'build' and *dinoko* that is a plural form of the word *senoko* 'syllable'. The term represents the concept of the study of the building up of syllables in a language. A syllable is a fundamental aspect of phonology, the choice of allophones

depends on the syllable structure of the particular language. A syllable is a unit of organization for an arrangement of speech sound, it normally comprises of a nucleus that is usually a vowel and an optional initial and final margins that are usually consonants (Zec, 2007). The field of phonotactics has a set of rules that ensures that words in the language follow the syllable structure permitted in that language. These are called **Phonological rules**, the suggested term for the concept in NS is **Melao ya popamedumo**.

Phonological rules appear when new words are formed or borrowed in a language where phonological processes happen to ensure the word follows the syllable structure of the language. **Phonological Changes** is any sound change that alters the distribution of phonemes in a language (Gussenhoven & Jacobs, 2017). The suggested term for the concept is **Diphetogo tša medumo**, the phrase is made of the word *diphetogo* that is the plural form of the word *phetogo* 'change', possessive concord *tša* 'of', and the word *medumo* 'sounds'. The phrase represents the concept of sound changes. There are different types of phonological processes that occur through word formation process. Taking into consideration the morphological process, deverbilization which is a process where a verb is turned into a noun.

An Example of the process is given below:

Given Verb	rata 'to love' → thato 'love'
Deverbalise /-a - . -o/	rato
Assign noun class 9	nrato
Assimilation /-r -> -th/	nthato
Underspecify /-n/	thato

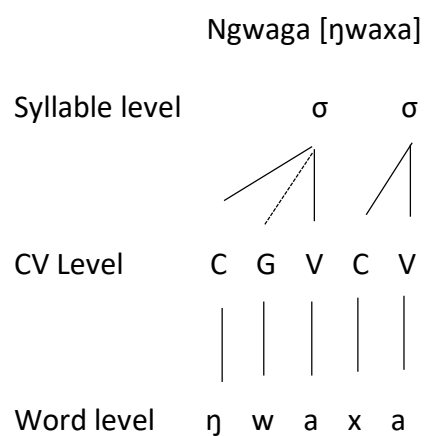
The example shows how *rata* 'love' became the noun *thato* 'love'. The first step was to deverbilise the verb by changing the default suffix of verbs /a/ into a /o/, secondly to assign the word a noun class 9 prefix in order to nominalise it, the noun class prefix turns the /r/ into /th/. Lastly, underspecify the noun prefix /n/. The morphological processes show the

phonological rule of Assimilation where /r/ assimilated to be more like /n/. **Assimilation** is sound change where some phonemes change to be more like other phonemes in their surrounding (Jun, 2004). The term in Ns is ***Khuetšano*** ‘to influence one another’, the term is derived from the word *khuetšo* that is ‘influence’. The kind of assimilation that occurs in the morphological process above is called **Progressive assimilation**. Where a sound influences the sound that follows it in a word to change (McCarthy & Smith, 2003). The term in NS term is ***Khuetšo ya go tšwelapele***, the phrase is made of the word *khuetšo* ‘influence’, *ya go* ‘that goes’, *tšwelapele* ‘forward’. The phonological process of *khuetšo* ‘assimilation’ occurs with other processes such as ***phumulo*** ‘deletion’, ***tsentšho ya ditumanoši*** ‘epenthesis’, and others listed in the glossary.

The notion of a syllable has led to many linguistic analytical insights. Different languages have different syllabic structures. A syllable in most languages is said to have a **Nucleus**. The term is adopted from the Latin language and it means ‘inner part’. The suggested equivalent in NS is ***Senokogare***, the term is a compound of the word *senoko* ‘syllable’ and the word *gare* ‘centre’. The equivalent represents the concept of a nucleus as the centre of a syllable. Prior to the nucleus, that is at the beginning of the syllable is the **Onset**. The onset is the consonant or sounds at the beginning of a syllable. The Equivalent of the term in NS is ***Hlogo ya senoko***, the phrase is made of the word *hlogo* ‘head’, the possessive concord *ya* ‘of’, and *senoko* ‘syllable’. The phrase is a representation of the concept of the first consonant of a syllable. Post the nucleus is the coda. A **coda** is the consonant at the end of a syllable. The etymology of the word is from the Latin word *cauda* ‘tail’. The suggested equivalent in NS is ***Mosela wa senoko***, the phrase is made of the word *mosela* ‘tail’, the possessive concord *wa* ‘of’, and *senoko* ‘syllable’.

4.3.2.2. Syllable structure of NS.

Hyman (1975:161) noted that the /cv/ syllable structure occurs in every language. NS consist of the following syllable structures /ccv/, /cc^wv/, /cv, /c^wv/ (Madigoe, 2003). The division of words into syllables is called **Syllabification**. The suggested equivalent for the term in NS is **Kabo ya dinoko**, the phrase is made of the word *Kabo* "division", possessive concord *ya* 'of', and *dinoko* 'syllable'. The phrase is a representation of the concept of a syllable division in a word. A syllabification of the word *ngwaga* 'year' is given below:



Syllabification of the word *ngwaga*.

The processes of syllabification first require the transcription of the word. This is given the top of the illustration. The illustration is a bottom up system beginning from the word level. The levels are referred to as segmental tiers, they contain the features that define the segments articulated in the phonological representations. A **segment** is any discrete unit that occur in a sequence of sounds which can be broken down into phonemes, syllables or words in a language. The etymology of the word is from the Latin word *secare* 'to cut'. The equivalent for the term in NS is **Seripa**, the term is made of the word *seripa* 'part'.

As such the equivalent of the term **Segmental tiers** in NS is proposed to be **Seripa sa ditekanešo**, the phrase is made of the word *seripa* 'part', *sa* 'of', and *ditekanešo* 'tiers'. The syllabification process begins at the word level where the word is written in its underlying

representation. The **Underlying representation** of a word is the dynamic structure that a word is proposed to have before any phonological principles have been applied (Gussenhoven & Jacobs, 2017). The suggested equivalent for the phrase in NS is ***Kemedi ya ka tlase***, the phrase is made of the word *kemedi* ‘representation’, *ya ka* ‘of’, and *tlase* ‘below’. The word is then written phonetically through transcription that is it is written in its surface representation. The **Surface representation** is what surfaces after the word has gone through phonological processes (Gussenhoven & Jacobs, 2017). The suggested term for the concept in NS is ***Bokagodimo bja kemedi***, the word is made of the word *bokagodimo* ‘surface’, *bja* ‘of’, and *kemedi* ‘representation’.

The different levels are linked with **Associative Lines**, the suggested term for the concept in NS is ***Methalo ya tswalanyo***, the phrase is made of the word *methalo* ‘lines’, the possessive concord *ya* ‘of’, and *tswalanyo* ‘relation’. The phrase is a representation of the concept of associating levels through lines. The level above the phonetic level is the **Parts of speech level**. At this stage the transcribed word is assigned a part of speech. The concept parts of speech in NS is ***Diripa tša polelo***, the phrase is made of the word *diripa* ‘parts’, *tša* ‘of’, and *polelo* ‘speech’. At this level sounds are identified as consonants, vowels, or glides. This level is followed by the syllable node level, the vowel as the nucleus of the word determines how many syllables a word has. Associative lines are drawn to identify the vowels as the nucleus and assign a syllable node to them.

Associative lines are then drawn to connect the consonants and glide to the syllable node. The connection of consonants to the syllable node does not follow the **Onset first principle (OFP)**. OFP states that onset that is the consonant on the left of the vowel should be considered first. The suggested equivalent for the principle in NS is ***Motheo wa Tumammogo ya mathomong a senoko***, the phrase constitutes of the word *motheo* ‘principle’, *wa* ‘of’, *tumammogo*

'consonant', *ya* 'of', *mathomong* 'at the beginning', *a* 'of', and *senoko* 'syllable'. The phrase encapsulates the concepts of the consideration of the consonant that come before the vowel. When a vowel is not preceded by a consonant neither proceeded by one, it becomes a **Syllabic**. The term in NS is suggested to be ***Senokonoši***, the equivalent consist of the word *senoko* 'syllable' and *nosi* 'alone'. The term represents the concept of the nucleus that exist alone.

4.3.2.3. Prosodic Features.

The concept of a segment can be described in terms of its features, the denoting of features of a segment is called **Suprasegmental** also referred to as **Prosodic features**. The term suprasegmental consist of the word supra and segmental, the etymology of the word supra is from Latin word *supra* that means 'above'. The equivalent of the term in NS is ***Senokophaphantšo***, the term is a compound that is made of the word *senoko* 'segment' and *phaphantso* 'difference'. The term encapsulates the concept of the features of a segment. Suprasegmental are features such as tone, stress, and pitch. **Tone** is the difference in the pitch of a sound while speaking. The term in NS is ***Segalo***, there are two distinctive tones in NS, namely the high tone (indicated by '́) and the low tone (indicated by '̀). The following are segmentally similar but semantically different due their distinct suprasegmental features:

Noka 'river'

Noka 'waist'

Noka 'spice food'

Length is the prolongation of sounds during speech production. The suggested term for length in NS is ***Botelele*** that means 'length'. The concept of length is connected to that of ***Prolongation***, the proposed term for the process is ***Telelefatšo***, the equivalent is a compound

made of the term *telele* 'long/tall' and *fatšo* 'process of doing something'. An example of length is given below:

Mol:lo

Sel:lo

The first /l/ in both words are followed by a semicolon to indicate that /l/ is pronounced with length. The last feature **Pitch** is the extent of stress produced when articulating a sound. The equivalent of the term NS is *Kgatelelo* 'emphases'. The concept of pitch is not observed in the Indigenous African Languages.

4.4. The glossary.

The glossary developed include two languages. The lemmas are in NS and definitions in English. The entry is made of a lemma, part of speech, gloss, the definition and an example where necessary. The lemmas are arranged alphabetically with the first word of a phrase determining the alphabet under which it would be placed. The examples below are of how simple words, compounds and reduplicates and phrases are entered in the glossary.

Theledi. *N. Glide.* Sounds that are semi-vowels and semi-consonants. [e.g. /w/ in *ngwana* 'child', /y/ in *yaka* 'mine']

Magoro a popafoko. *N. Syntactic categories.* Word classes, largely corresponding to parts of speech. [e.g. *lediri* 'verb', *leina* 'noun']

Tumagwaša. *N. Fricative.* Sound that are produced with a friction of breath in a narrow opening. [e.g. /s/ *selepe* 'axe', /f/ *fepa* 'feed']

4.5. Findings.

4.5.1. Access to terminology.

The collection of terms proved to be challenging from both the source and the target language. Though English has a lot of concise linguistics dictionary, it was rather a challenge to select data that was appropriate for undergraduate syllabus. This created a lot of confusion as the researcher had to remember what was and what was not taught undergraduate so not to include concepts that do not exist within the language mainly because they appear both in the English dictionaries and the African languages materials. Due to fact that the African languages linguistics course is taught in English finding equivalents in NS presented its own challenges that differed from the English data.

Many authors such as Mojapelo (2018), Nkomo (2010), Alberts (2010) have written about the obscure channels of terminology dissemination. Batibo (2010) argued that issues relating to the dissemination of terminology to the relevant users stems from the bodies that are in charge of terminology development. The department of arts and culture (DAC) is responsible for terminology development and dissemination, the NLS and PanSALB are sectors dedicated to terminology development within DAC. These sectors produce dictionaries, glossaries for publication, though through a search of their work there was no concise linguistics dictionary or any learners' dictionaries. Their data consisted of a lot of hard science dictionaries.

As a result, a lot of the NS terms were found from the discontinued Terminology and Orthography No.4, 1988, online linguistics terminology dictionary by *Tswanelex*, Grammar books and academic papers that wrote about the linguistics aspects of NS. Though most of the academic papers were written in English hence the linguistic concepts were used in the source language and examples of the concepts would be in NS. Terms found through these

channels were those that also appear within the general language while complex linguistic terms such as Egressive pulmonic airstream, ingressive pulmonic airstream, vocal tract etc, would not be found in these resources.

4.5.2. Northern Sotho nomenclature.

There are many term creation processes, such as borrowing, transliteration, paraphrasing, semantic transfer, and compounding. Different languages utilise or rather favour different strategies over others based on the morphology of each language. Though there is a variety of methods to term creation, the different languages use different methods based on backgrounds of certain domains (Magagane, 2011). NS like many indigenous African Languages applies the CV morphology rule which is consonant vowel syllable. The analysis of the data was quidded by the internal structure of the language, even though terms may represent the concept in hand fully, it mattered that the term was not in violation of the morphological structure of the language.

Equivalent found and analysed revealed that the nomenclature of the North Sotho terms is either simple words, compounds, reduplicates, or phrases. Most of the terms used Compounding over the other processes. Compounded terms were made of a descriptive word and the core morpheme or word of the main concept. When a term is compounded by combining the descriptive word with the core morpheme, the core morpheme is suffixed to the descriptive word. When a term is formed by compounding the descriptive word and the word of the main concept, the word of the main concept is prefixed to the descriptive word. Mphasa (2006) notes that compounding is one of the term formation process that involves coining of terms through combining two or more words to form one long entity. Usually compounds have two heads that is on the left and on the right. Compounding can be a noun to a noun, noun to verb, adjective to noun, adverb to noun, and many more. Taking into

consideration the fact that linguistics is the scientific study of the general language, a lot of the scientific terms that occur within the field can be expressed in general language through paraphrasing, compounding or translation. As a result, the data dealt with in this study did not involve any borrowing from the source language.

4.6. Conclusion.

As stated before, the majority of the NS equivalents were found in the government O&T. The book is a terminology book of all terms in the language it is not a field specific terminology book. The other terms were found in NS general dictionaries and grammar books. Though these resources provide terms that appeared both in the general language and linguistics but not field specific terms. The NLU's of PanSALB are mandated by the government to develop terminology. Over the years they managed to compile monolingual and bilingual general dictionaries. Though searching their data bases shows no development of specialised dictionaries. NS faces a lot of deficit in scientific language dictionaries. Within the field of linguistics, many authors have written about the linguistic structures of NS. Though all the papers are analysis of the language in the English language, the examples of the papers are in NS, but the concepts are expressed in English.

Chapter 5: Conclusion.

5.1. Introduction.

This final chapter contains a summary of the study, the findings and its conclusions. The findings are presented according to the objectives of the research. As such, the study gives feedback on the results of each objective. The objective of the study is four-fold. Firstly, to harvest the source data. Secondly, to find and analyse their equivalents in NS. Thirdly, to suggest neologisms where research draws blank. Lastly, to develop a term bank for the terms. As such, the results below present the outcome of each objective, respectively. Finally, the chapter presents the implications, limitations, challenges, and future works of the research.

5.2. Summary of study.

The aim of the study was to develop a glossary of linguistics terms in NS for higher education. In line with the problem statement of the research, that is the need for terminology development in higher education, the study was conducted for the purpose of facilitating learning and teaching of African languages in their own media in higher education. The study followed a qualitative approach to the analysis of the data. The theory of onomasiology was used to confirm the appropriateness of existing equivalents and to coin terms that did not have equivalents. The selection of the source data was based on purposive sampling technique where secondary data that is relevant to the topic of the research was purposively selected. The analysis followed a thematic analysis approach, where the data was accounted for numerically and thematically based on how they appear in the field of phonetics and phonology. Various equivalents that were found through research are presented in the analysis while terms that are coined by the researcher are suggested. The terms are entered into the FLex program to produce a bilingual glossary of NS and English.

5.3. Summary of findings.

5.3.1. Source data search.

The source data of the research that is the English terms were collected from the African languages undergraduate course materials, from first to third year, linguistics books and linguistics dictionaries. The English data amounted to 163 terms across Phonetics and Phonology. Eighty-five percent of the English data was sourced from African languages linguistics course books, while the 10% was found in linguistics textbooks and 5% in linguistics dictionaries. The reason why other terms were found outside of the course materials taught to the undergraduate is because some concepts are verbally taught but not presented in their course material. Terms within phonetics such as the subfields of phonetics are not present in the course material though students are made aware of all the aspects that make up the field of phonetics. As such, terms such as 'acoustics phonetics', 'spectrogram', and 'spectrograph' would be found in linguistics books and dictionaries. The data was listed thematically in order to make the search of NS equivalents easier.

5.3.2. North Sotho equivalents search.

The second objective of this research was to find equivalents of the harvested English linguistic terms in NS. Thirty-nine percent of the 163 English terms were found in NS through the search, while 61% of the terms were without equivalents. Out of the 39% equivalents found, 24% of the equivalents were found in T&O, No.4 while 10% was found in NS grammar book and the remaining 5% in NS dictionaries. Terms found in T&O, No.4 were more field specific such as the term; *Khuetšo ya ditumotswana* 'homorganic assimilation'. The terms found in grammar books were more of the accepted and standardized terms such as *segalo* 'tone', terms that are standardized and accepted such as *segalo* were found in all three

sources, the dictionaries, grammar books and T&O, No.4. Hence, terms found in dictionaries were those found in general language such as *Botee* 'singular'. Terms with equivalents are presented in table 1, appendix A.

The equivalents found were analysed following the steps provided by the theory of onomasiology. The analysis revealed that the nomenclature of the NS terms is either simple words, compounds, or phrases. Most of the terms used Compounding over the other processes. According to (Madiba, 2001) compounding strategy is a preferred method of word formation in many African languages. The analysis showed that compounded terms were made of a descriptive word and the core morpheme or word of the main concept. When a term is compounded by combining the descriptive word with the core morpheme, the core morpheme is suffixed to the descriptive word. For example, the term:

lebopamedumo 'phoneme'

The term is a compounded term made of the descriptive word *lebopa* 'builder' and suffixed core morpheme *medumo* 'sounds'. When a term is formed by compounding the descriptive word and the word of the main concept, the word of the main concept is prefixed to the descriptive word. For example, the terms:

tumakelelo 'liquits'

tumankong 'nasal'

the terms are compounds of the main concept *tuma* 'sound' that is prefixed to a descriptive word of where the sound comes from or how its produced, and in this case *kelelo* 'continuous flow' and *nkong* 'nose'.

Due to the closeness of the linguistics field to general language, the formation of simple terms was based more on descriptive words of the main concept at hand. The simple terms were

coined based more on the study of the etymology of the source term. An example is of the term:

Tlogelo 'Ellision'

The etymology of the word is from the Latin word *elidere* that means 'crush out'. Hence the equivalent in NS *tlogelo* is a description of something that is left out. The equivalents were also made of phrases. Unlike simple terms, phrases were more translations than descriptive in nature. Phrases in the target language were equivalents of phrases in the source language though not limited to the latter. For example, the phrase:

Diphetogo tša thutapopomedumo 'phonological changes'

The phrase is a translation of the concept 'changes' that is *diphetogo* in NS, and the concept 'phonology' that is *thutapopomedumo*. As stated above, phrases were more common when the source term is a phrase itself though not limited to it. An example of a term with a phrase equivalent include the term:

Tumarinini le magalagapeng 'Alveopalatal'

The source term is a compound of the word 'alveolar' and 'palatal'; the compound is an agglomeration of the two concepts. As such the equivalent phrase *tumarinini le magalagapeng* encapsulates the two concepts embedded within the source compound term.

5.3.3. Terms without Equivalents.

As noted in section 5.3.2., 61% of the 163 terms were without equivalents. The terms were studied following the steps of the theory provided in chapter 3. The suggested neologisms were assigned following the nomenclature made visible by related terms with equivalents. Hence, the suggested neologism were either simple words such as the term *ditumišo* 'articulators'. Though terms related to this concept are studied in order to coin the term. The etymology of the source term proved more useful in coming up with an equivalent that

represented the concept fully. The etymology of the word is from the Latin word *articulātus* that means ‘articulated’. The word *ditumišo* represents the concept of objects that produce sounds. Like the English term, the term *ditumišo* is ambiguous in nature, as it does not point out to the things that produce the sounds. Though like the term ‘articulators’, the NS term can be standardized within the field of linguistics to represent the body organs that produce speech sounds.

The suggested neologisms also included compound words. The nomenclature of the compound words involved a word of the main concept plus a descriptive word that answers where the concept occurs. For example, the term:

tumaleleme ‘coronal’

The term coronal is related to other terms that fall under the concept ‘manner of articulation’ such as plosives, fricatives, stops, etc. Based on the equivalents of related terms found through research, such as *tumankong* ‘nasal’, *tumakelelo* ‘liquid’ and *tumakhutlo* ‘stops’, it is visible that the nomenclature of the terms related to the concept of ‘manner of articulation’ is a combination of the word *tuma* ‘sound’ and a descriptive word of where the sounds is produced from. The etymology of the English word is from the Latin word *coronalis* ‘crown’. Coronal sounds are sounds produced with the front part of the tongue, the crown. As such, the equivalent is coined based on the nomenclature of the terms that is *tuma* ‘sound’ and *leleme* ‘tongue’ that is quidded by both the definition of what coronal sounds and the etymology of the word.

The equivalents coined also included phrases. The phrases occurred mostly when the source term is a phrase but not limited to it like the equivalents found. As stated in section 5.3.2. Above, the phrases were more of translations, although the steps given by the theory are followed to ensure that the suggested phrase represents the concept it stands for. As such,

the etymology of the main word of the concept is considered and the phrase is studied in relation to concepts it is related to. For example, the term:

Kgokolo ya ditumanoši 'rounded vowels'

The concepts fall under the larger concept of *ditumanoši* 'vowels' and is therefore related to *tumanoši tše gašitšweng* 'unrounded vowel'. The etymology of the term round is from the Latin word *rotundus* meaning 'circular'. The equivalent of the phrase in NS *Kgokolo ya ditumanoši* is guided by the etymology and meaning of the source term. The phrase is made of the word *kgokolo* 'roundness', *ya* 'of' and *ditumanoši* 'vowels' that encapsulates the concept of vowels produced through rounded lips. As noted before equivalent phrases were not limited to phrases in the source language. For example, a simple term would have an equivalent phrase such as:

Abagano ya dinoko 'syllabification'

The term is related to other terms such as *senoko* 'syllable', *senokonoši* 'syllabic', *kago ya senoko* 'syllable structure', etc. The main concept of the term syllabification is a 'syllable', as such, the term syllabification is the division of syllables. The etymology of the term syllable is that of the Greek word *syllable* 'that which is held together'. The meaning of the term is a unit of association for an arrangement of speech sounds. The equivalent in NS *senoko* is based more on the meaning of the term being a unit of speech. As such equivalent of syllabification in NS represent the concept of *abagano* 'division', *ya* 'of', *senoko* 'syllable'. Equivalent phrases were also formed from compound words in the source language such as *tumarinini le magalagapeng* 'alveopalatal'. Terms that stood alone without relating concepts were formed through translation, such as the term *Rapemego bja leleme* 'horizontal modification'.

5.4. The glossary.

The 163 terms were entered into the FLex programme to develop a term bank. The terms were entered as lemmas into FLex programme and produced a glossary made of the lemma in NS, part of speech, the synonym and definition of the lemma in English and examples in both NS and English. The lemmas are arranged alphabetically with the first letter of each term, be it a simple word, as compound or a phrase determining the letter under which the term would be placed. Hence, a simple word would be stored as follows:

Ss

Segalo. N. Tone. The utilization of pitch in a language to recognize lexical or syntactic meaning.

The first letter of the simple word determines where in the alphabetical glossary is it stored, as such *segalo* 'tone' would be stored under the letter 'S' as noted above. The same principle applies to compound words exemplified below:

Tt

Tumakhutlo. N. Stops. Sounds produced with the closure of the articulators to obstruct the airstream. [e.g. /n/ in *nku* 'sheep', /ng/ in *ngapa* 'scratch'].

The compound word is entered based on the first letter of the concept that appears first within the word. As such the compound *tumakhutlo* 'stops' is stored under the letter 'T' as shown above. The first letter that appeared in the first word of a phrase also determined under which the letter would be phrased shown below:

Abagano e fapanago. N. contrastive Distribution. The connection between two distinct components where the two components are found in a similar domain with an adjustment in meaning.

The first letter of the first word in the phrase *abagno* 'distribution' would determine where the phrase is stored. The term bank is presented in Appendix C.

5.5. Challenges.

Most of the equivalent were found in Terminology and Orthography No.4, 1988, a book out of print and rare to find, hence it was difficult to work with as it could not be taken out of the library. The terms without equivalents presented the challenge of forming neologisms that described the concept and was not ambiguous within general language. With all the terms collected, the process of entering the lemmas into FLex proved to be a laborious duty due to the nature of the orthography of North Sotho. Every lemma required the special entry of the symbol [š]. Due to the fact that the glossary could not be saved from the program and can only be printed, turning the pdf document into word in order to allow editing substituted the special character. This meant that the researcher had to manually re-enter the symbol and this proved to be a labourous processe.

5.6. Implications.

As noted in section 5.2, 70% of the terms were found in NS, although the terms were mainly found in the government book T&O vol.4. Terms within this book are not arranged according to discipline but haphazardly. They are not given definitions or part of speech. Taking into consideration the rationale behind conducting this research, the scholarship now has a

glossary that is presented with meaning and part of speech that would contribute to the leaning and teaching of linguistics concepts in NS.

5.7. Limitations.

Due to the limited scope of a master's degree, the research was conducted focusing on the linguistics course material taught within the University of the Witwatersrand only. As such the concepts covered within the glossary may not include all the concepts taught in an undergraduate degree in linguistics. Though, the researcher has done an intensive search of the equivalents in NS it cannot be concluded that the equivalents are all that has been developed within the field of linguistics in NS.

5.8. Future works.

What this research proved was the lack of standardization of scientific language terms within African Languages. This lack is detrimental to the development of the languages. As mentioned in Chapter 2 standard terminology has an important role to play to dictionary/glossaries compilation, subject specific communication, editing and to the quality of translations (Alberts, 2010). Therefore, it is a tactical source and has a key role to play to the development of not only the languages but their users. Subsequently, successful exchange and absorption of information and skills among subject specialists and laypeople and the communication abilities of the residents of a nation are developed through the use of accurate terms (Alberts, 2010). With enough time for an intensive search of all concepts taught in linguistics, the researcher would develop a comprehensive linguistics glossary.

5.9. Conclusion.

Terminology development of official languages leads to the development of the languages into functional languages in all spheres of life such as higher education, politics and others (Alberts, 2010). This study developed neologisms for the field of linguistics for higher education. The neologisms together with the terms found through research were put together to produce a bilingual glossary. The terms created increases the vocabulary of NS by creating more new special terms in the language. This is essential in developing the language, but most importantly facilitates learning for mother tongue speakers of Northern Sotho in Higher Education and for mother tongue speakers of the language.

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Appendix A.
Equivalents found.

	English Term	NS Equivalent
1	Phonetics	Thutamedumo
2	Epiglottis	Mometšo
3	Larynx	Kodu
4	Oral cavity	Legano
5	nasal sounds	Tumankong
6	Phone	Modumo
7	Consonant	Tumammogo
8	Vowel	Tumanoši
9	Cardinal vowel	Tumanošikgolo
10	Syllable	Senoko
11	Labial sounds	Ditumapounameng
12	Labiodental	Tumapouinong
13	Dental	Tumainong
14	Bilabial	Tumadipou
15	Glottal	Tumakgokgokgo
16	Alveolar	Tumarinini
17	Palate	Magalagapa
18	Velum	Tlalongwala
19	Glottis	Lešobakgokgokgo
20	lungs	Maswafo
21	Uvula	Lelengwana
22	Stops	Tumakhutlo
23	Nasals	Tumankong
24	Fricatives	Tumagwaša
25	Affricatives	Tumagwaša
26	Aspiration	Moyafatšo
27	Labialization	Molomofatšo
28	Palatalization	Kgalagapišo
29	Alveolarization	Rininifatšo
30	Velarization	Tengwanafatšo
31	Elision	Tlogelo
32	Phonology	Thutapopamedumo
33	Phoneme	Lebopamedumo
34	Phonological changes	Diphetogo tša thutapopomedumo
35	Derivation	Matšo

36	Deletion	Phumulo
37	Substitution	Kemelo
38	Assimilation	Khuetšano
39	Homorganic assimilation	Khuetšo ya ditumatshwano
40	Progressive assimilation	Khuetšo ya go tswela pela
41	Epenthesis	Tsentšho ya ditumanoši
42	Vowel coalescence	Momagano ya ditumanoši
43	Glide formation	Popotheledi
44	Reflexivization	Leitirano
45	Passivization	Tirwano
46	Passivizer	Lebopantšu-tirwa
47	Associative	Lekgokaganyi
48	Idiom	Seka
49	Proverb	Seema
50	Numerical	Lebadi
51	Ordinal	Tatelano
52	Inflection	Popontšu
53	Predicate	Tiro/ Lediri
54	Levels	Maemo-tekanešo
55	Margin	Mollwane/Morato
56	Coda	Mosela wa senoko
57	Nucleus	Tumanoši ya gare ga senoko
58	Segment	Seripa
59	Syllable structure	Kago ya senoko
60	Tone	Segalo
61	Length	Botelele
62	Glide	Theledi
63	Liquid	Tumakelelo

Appendix. B

Terms suggested by researcher.

	English Term	NS Equivalent.
1	Acoustic Phonetics	Thutokemo ya medumo
2	Auditory Phonetics	Thutokutlo ya medumo
3	Articulatory Phonetics	Thutopolelo ya medumo
4	Spectrograph	Setšea seswantšho sa medumo.
5	Spectrogram	Seswantšho sa medumo.
6	Frequency	Modumopoeletšo.
7	Speech chain	Tatelalo ya puo
8	Vocal organs	Ditho tša medumo
9	Vocal tract	Tsela ya medumo
10	Airstream Mechanisms	Tsela ya moyaelelo
11	Nasal cavity	Mosela wa nko.
12	Oral sounds	Tumamolomong
13	Egressive pulmonic airstream	Moyaelelo goya ntle
14	Ingressive pulmonic airstream	Moyaelelo goya kagare
15	Vocal folds/cords	Mara a medumo
16	Phonation	Modumišo. ¹
17	Voicing	Modumišo. ²
18	Voiced	Tumakodu.
19	Voiceless	Tumatu.
20	Pharynx	Mogolonthago
21	Monophthong	Tumanošitee
22	Diphthong	Tumanošipedi
23	Triphthong	Tumanošitharo
24	Unrounded vowel	tumanoši tše gašitšweng
25	Rounded vowel	kgokolo ya ditumanoši
26	Vertical Modification	phetogo ya godimothwii
27	horizontal modification	rapamego bja leleme
28	Tongue height	bogodimo bja leleme

29	High	Godimo
30	Low	Tlase
31	Midlow	Garefase
32	Midhigh	Godimogare
33	Open syllable	Senoko se bulegilego.
34	Closed syllable	Senoko se tswaletšego
35	Monosyllabic	Senokotee
36	Disyllabic	Senokopedi
37	Open syllable	Senoko se bulegilego.
38	Closed syllable	Senoko se tswaletšego
39	Monosyllabic	Senokotee
40	Disyllabic	Senokopedi
41	Alveopalatal	Tumarinini le magalagapeng
42	Velar	Tumatlalongwala
43	Uvular	Tumalelengwaneng
44	Pharyngeal	Tumamogolonthago.
45	Place of articulation	Sethong sa puo
46	Articulators	Ditumišo
47	Alveola ridge	Kutupele legalagapeng
48	Blade	Mathomo a leleme
49	Tip	Mafelo a leleme
50	Root of tongue	Morago a leleme
51	Medial	Lelemegare
52	Passive articulators	ditho tša puo
53	Active articulators	Ditho tša tiro ya puo
54	Secondary articulation	Ditumišo tša bobedi.
55	Percussive	Tumaratha.
56	Articulation	Kwagatšo
57	Manner of articulation	Mokgwa wa puo
58	Plosives	Tumathupa
59	Coronal	Tumaleleme
60	Lateral sounds	Tumatheko
61	Tense	Ngango
62	Sonorant	Ditumotlalo
63	Obstruent	Ditswalelwano
64	Sonority sequencing principle	Motheo wa tatelano ya ditumatlalo.
65	Transcription	Mongwalo wa medumo
66	Non-continuants	Diemišo

67	Continuants	Dielelo
68	Sonority hierarchy	Namelō ya ditumatlao.
69	Distinctive features	Dipopomedumo ya go fapana.
70	Phonotactics	Thutopopadinoko
71	Allophone	Tumanošitharo
72	Contrastive distribution	Abagano e fapanago
73	Free variation	Phapano e lokologilego
74	Complementary distribution	Kabo ya tlaletšo/ Abagano ya tlaleletsano
75	Minimal pairs	Dihlopha tše nyenyane
76	Phonological rules	Melao ya popamedumo
77	Reversive assimilation	Khuetšo ya goya morago
78	Juxtaposed vowels	Tatelano ya ditumanoši
79	Association line	Methalo ya tswalanyo
80	Tiers	Ditekanetšo
81	Hierarchy	Namelō
82	Onset	Hlogo ya senoko
83	Underlying representation	Kemedi ya ka tlase
84	Surface representation	Kemedi ya ka tlase
85	Segmental phonology	Thutapopomedumo ya dinoko.
86	Universal syllable structure	Poposenoko ya lefase ka bophara.
87	Underspecification	Timelelo e itšego.
88	Syllabification	Abagano ya dinoko
89	Syllabic	Senokonoši
90	Suprasegmental	Senokophaphantšo
91	Pitch	Kgatelele
92	Stress	Kgatelele
93	Sequence	Tatelano
94	Segmental tier	Seripa sa ditekanetšo
95	Prolongation	Telelefatšo
96	Onset first principle	Motheo wa Tumammogo ya mathomong a senoko

97	Obligatory counter principle	Motheo wa tlamo ya medumo
98	Monosegmental	Senokotee
99	Latero-alveolar	Tumariningthoko
100	Delayed released sounds.	Lokollo diego ya medumo

Appendix C.

NS Glossary.

Aa

Abagano e fapanago. *Adv.* Contrastive distribution. The relationship between two different elements in which both elements are found in the same environment with a change in meaning. [e.g. /b/ bina 'dance' and /p/ pina 'song']

Bb

Bogodimo bja leleme. *Adj.* Tongue height. The position of the tongue in reference to the roof of the mouth when making vowel sounds. [e.g. tumanošigodimo 'high vowels' /i/, /u/ or tumanošifase 'low vowels' /e/, /a/]

Bokagodimo bja kemedi. *N.* Surface representation. The phonetic representation of a word after phonological rules have applied. [e.g. ŋ^wana 'child', /ɲala 'marry']

Botelele. *N.* Length. The perceived duration of a vowel sound. [e.g. lo:/ mo:llo 'fire' is a long vowel VS /o/ motho 'person' is a short vowel]

Dd

Dielelo. *Adj.* Continuants. A consonant produced with the vocal tract partially closed, allowing the breath to pass through and the sound to be prolonged. [e.g. /s/ sekolo 'school' /f/ fase 'floor', /l/ lewatle 'ocean']

Diemišo. *Adj.* Non-continuant. Sounds that are produced with a momentary and abrupt release of air. [e.g. /p/ poso 'mail', /t/ tate 'father' /k/ kobo 'blanket']

Dihlopha tše nyenyane. *N.* Minimal pairs. Words that differ in only one phonological element, such as a phoneme and have distinct meaning. [e.g. pitša 'pot' and bitša 'call' / ema 'stand' and apa 'dig']

Diphetogo tša medumo. *Adv.* Phonological changes. Sound change that alters the distribution of phonemes in a language. [e.g. *khuetšano* 'assimilation', *tlogelo* 'elision']

Diripa tša polelo. *N.* Parts of speech. Word categories assigned in accordance with their syntactic functions. [e.g. *maina* 'nouns', *lediri* 'verb', *lehlaodi* 'adjective']

Ditekanetgo. *N.* Tiers. A set of annotations that share the same characteristics. [e.g. *tekanetšo ya mongwalo* 'orthographic tier']

Ditho tša medumo. *N.* Vocal organs. Body parts that are involved in the production of speech sounds. [e.g. *magalagapa* 'Palate', *lešobakgokgokgo* 'glottis', *lelengwana* 'uvula']

Dithotiro tša puo. *N.* Active articulators. Vocal organs that carry out movement during the production of speech. [e.g. *leleme* 'tongue', *lešobakgokgokgo* 'glottis', *pounama ya ka godimo* 'upper lip']

Dithotirwa tša puo. *N.* Passive Articulators. Vocal organs that do not move during the production of speech. [e.g. *magalagapa* 'palate', *lelengwana* 'uvula', *mogolonthago* 'pharynx']

Ditswalelwano. *N.* Obstruent. Sounds produced with obstruction of the airflow. [e.g. /k/ *kagare* 'inside', /f/ *fetola* 'answer', /s/ *sega* 'laugh']

Ditumatlalo.₁ *N.* Sonorant. Sounds that are produced with continuous, non-turbulent airflow in the vocal tract. [e.g. /g/ *godimo* 'up', /m/ *molomo* 'mouth', /n/ *noka* 'waist']

Ditumatlalo.₂ *N.* Resonant. Sounds that are produced with continuous, non-turbulent airflow in the vocal tract. [cf, ditumatlalo₁]

Ditumišo. *N.* Articulators. Vocal organs that are involved in the production of speech. [e.g. *meno* 'teeth', *kodu larynx*, *melomo* 'lips']

Ditumišo tša bobedi. *N.* Secondary articulation. An additional feature in the pronunciation of a consonant. [*e.g. kgalagapišo 'palatalization', molomofatšo 'labialization', rininifatšo 'alveolarization'*]

Dipopomedumo ya go fapana. *N.* Distinctive features. Features of a sound system of a language that serve as the crucial distinguishing mark between two phonemes.

Hh

Hlogo ya senoko. *N.* Onset. The first phonological unit in a word. [*e.g. /s/ in senoko 'segment', /h/ in hlogo 'head'*]

Kk

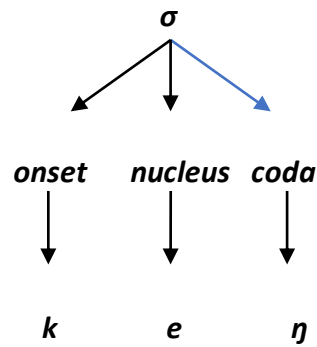
Kabo e lokologilego. *N.* Free variation. The phenomenon of two sounds appearing in the same environment without a change in meaning.

Kabo ya dinoko. *N.* Syllabification. The process of dividing words into syllables. [*e.g. /di/no/ko/ 'syllable', /ka/bo/ 'classification'*]

Kabo ya tlaletšano. *N.* Complementary distribution. Sounds that appear in mutually exclusive context.

Kago ya senoko. *N.* Syllable structure. A structure that represents the elements of a word such as its onset, nucleus and coda. [*e.g. keng 'what'*]

Syllable



Kemedi ya ka fase. *N.* Underlying representation. The underlying form of a word or morpheme is the abstract form that a word is postulated to have before phonological rules have applied. [*e.g. ngwana 'child', nyala 'marry', CF-bogodimo bja kemedi above*]

Kemelo. *N.* Substitution. A phonological process that involves the replacement of a word with another.

Kgalagapišo. *N.* Palatalization. Sound change in which a nonpalatal consonant changes to a palatal consonant.

Kgokolo ya ditumanoši. *N.* Rounded Vowel. Vowels produced with rounded lips. [*e.g./o/ motho 'person' /u/ mmutla 'rabbit'*]

Khuetšano ya ditumatswano. *N.* Homorganic assimilation. A phonological processe where the sound changes based on the sound before it and in turn changes the sound that changed it too.

khuetšano ya go tšwelapele. *N.* Progressive assimilation. A phonological change where a sound changes with reference to a preceding segment.

Khuetšano. *N.* Assimilation. A phonological process where a sound changes based on the sound near it.

Khuetšo ya goya morago. *N.* Reversive assimilation. A phonological change where a sound changes with a reference to the segment following it.

Kodu.1 *N.* Larynx. A speech organ situated in at the top of the neck that is also involved in breathing and protecting the trachea against food aspiration.

Kodu.2 *N.* Voice. A sound produced by the larynx and uttered through the mouth.

Kutupele legalagapeng. *N.* Alveolar ridge. The soft membrane behind the upper teeth before the hard palate involved in the production of speech sounds such as /l/, /t/, /n/.

Kutu ya leleme. *N.* Root of the tongue. The part at the far back and bottom of the tongue, forming the front wall of the pharynx.

Kwagatšo. *N.* Articulation. The formation of clear and distinct sounds of speech.

LI

Lebadi. *N.* Numerical. A word that expresses a number or numbers.

Lebopamedumo. *N.* Phoneme. The smallest unit of sound in a word that brings about the meaning of the word.

Lebopantšu-tirwa. *N.* Passivizer. A unit of speech that turns a verb into a passive. [*e.g.* /w/ *tiro* 'active' ---> *tirwa* 'passive']

Legalagapa le boleta. *N.* Velum. Membrane at the back of the mouth partly obscuring the opening of the throat. As a speech sound it is involved in the production of sounds such as /g/, /k/, /ng/.

Legano. *N.* Oral cavity. The space from the lips to the end of the hard palate involved in the production of sounds produced with oral organs such as the teeth, palate and the tongue.

Leitirano. *N.* Reflexivization. The action of making a verb, noun, phrase, etc. reflexive. [*e.g.* *rata* --> *ithata*, *seha* ---> *itshega*]

lekgokaganyi. *N.* Associative. Words that show association of words.

Leleme. *N.* Tongue. An organ inside the mouth, as an organ of speech it is considered the most active articulator.

Lelemegare. *N.* Medial. The middle part of the tongue. as a vocal organ it is involved in the production of sounds such as: /l/, /n/, /t/.

Lelengwana. *N.* Uvula. A fleshy extension at the back of the soft palate which hangs above the throat. As a vocal organ it is involved in the production of sounds such as: /g/, /q/.

Lešobakgokgokgo *N.* Glottis. Part of the larynx consisting of the vocal cords and the opening between them.

Lokollo diego ya medumo. *Adj.* Delayed release sounds. The period of semi-closure during which the frication sound is produced.

Mm

Maemo-tekanetšo. *N.* Levels. Phonological stages of a word.

Magalagapa. *N.* Palate. The hard membrane at the roof of the mouth, as an organ of speech it is used in the production of sounds such as, /ny/, /j/.

Mara a medumo. *N.* Vocal folds. Two membranes inside the larynx that open or closed in the production of speech.

Maswafo. *N.* Lungs. Air-filled organs located on either side of the chest.

Mathomo a leleme. *N.* Blade of the tongue. The beginning of the tongue.

Matšo. *N.* Derivation. A phonological process where words are derived from other words.
[e.g. *Ruta* → *Thuto* 'education', *tsamaya* → *motsamayi* 'walker']

Medumofapano. *N.* Allophone. Variants of the same phoneme in a language which do not contribute to distinction of meaning.

Melao ya popamedumo. *N.* Phonological rules. Rules governing phonological changes in a language.

Melomo. *N.* Lips. Soft moveable membrane at the beginning of the mouth that serves as opening for food and articulation of sounds.

Meno. *N.* Teeth. Hard calcified structure found in the jaws used to break down food and articulation of speech.

Methalo ya tswalanyo. *N.* Associative lines. Lines that link segments on the tonal tier to the segments on the segmental tier.

Modumišo.₁ *N.* Phonation. A phonological process of uttering a speech sound.

Modumišo. *N.* Voicing. The utterance of a speech sound with resonance of the vocal track.

[*e.g.* /d/ *ditholwana* 'fruits', /p/ *Phutha* 'pack', /m/ *maswika* 'rocks']

Modumo. *N.* Phone. A distinct speech sound regardless of whether the sound is critical to the meaning of words.

Modumopoeletšo. *N.* Frequency. The speed of the vibrations of the speech waves.

Mogolonthago. *N.* Pharynx. The part of the throat behind the mouth and nasal cavity.

Mokgwa wa puo. *Adj.* Manner of articulation. The interaction of the different articulators in the production of speech. [*e.g.* *turnakhutlo* 'stops', *Tumagwaša* 'fictives', *tumankong* 'nose']

Molomofatšo. *N.* Labialization. A phonological process where non-labial sounds are turned into labial sounds.

Momagano ya ditumanoši. *N.* Vowel assimilation. Sound change where a vowel changes to be more like the nearby sound.

Mometšo. *N.* Epiglottis. A flap of cartilage behind the root of the tongue, which is depressed during swallowing to cover the opening of the windpipe and opened during speech production.

Mongwalo wa medumo. *N.* Transcription. The visual representation of speech sounds by means of phonetic symbols.

Morago ga leleme. *N.* Back of tongue. The end of the tongue, as a speech organ it is raised for the production of velar sounds.

Mosela wa nko. *N.* Nasal Cavity. The inside of the nose.

Mosela wa senoko. *N.* Coda. The syllable that follows the nucleus of the word. [*e.g. /ng/ in kgong 'firewood' and /ng/ in jwang 'grass'*]

Motheo wa tatelano ya ditumatlalo. *N.* Sonority sequence principle. A phonotactic principle that outlines the structure of a syllable in terms of sonority.

Motheo wa tlamo ya medumo. *N.* Obligatory counter principle. A phonological hypothesis that states that certain consecutive identical are not allowed in underlying representation.

Motheo wa tumammogo ya hlogo ya senoko. *N.* Onset first principle (OFP). A principle governing the division of syllables that states that the assignment of a consonant to a vowel are maximally to the onset first.

Moyafatšo. *N.* Aspiration. The strong burst of breath that accompanies the release of some obstruents. [*e.g./ph/ phatla 'forehead' /di/ thaba 'mountain', /kh/ khapha 'accompany'*]

Moyakakgokgoko. *N.* Trachea. A tube under the larynx commonly known as the windpipe.

Moyakelelogare. *Adj.* Ingressive airstream. Airstream mechanism where the air flow from outside into the lungs through the mouth or nose.

Moyakelelontle. *Adj.* Egressive airstream. Airflow where the air is pushed out of the lungs through the mouth or nose.

Nn

Namelo. *N.* Hierarchy. The organizational structure that ranks units according to levels.

Namelo ya ditumatlao. *N.* Sonority hierarchy. The ranking of speech sounds looking at what sounds are more sonorant or less sonorant.

Ngango. *N.* Tense. The time described by a verb shown by its grammatical form.

Ntlha ya leleme. *N.* Tip of tongue. The edge of the tongue, used in speech production to produce dental sounds such as: /th/.

Pp

Phetogo ya godimothwii. *Adv.* Vertical modification. Vertical tongue position refers to how close the tongue is to the roof of the mouth in the production of a vowel.

Phumulo. *N.* Deletion. The omission of one or more sounds in a word

popontšu. *N.* Inflection. The insertion of a sound in a word.

Poposenoko ya lefase ka bophara. *N.* Universal syllable structure. A syllable structure perceived to be shared by all languages of the world. [*e.g. /cv/ja 'eat'*]

Popotheledi. *N.* Glide formation. A process whereby an underlying high front vowel is realised as a glide. [*e.g. motho + ana = mothwana 'small person'*]

Rr

Rapemego bja leleme. *Adv.* Horizontal modification. Horizontal tongue refers to where the tongue is positioned in the vocal tract in terms of 'at the front' or 'at the back' when a vowel is produced.

Rininifatšo. *N.* alveolarization. A phonological process where non-alveolar sounds are turned into alveolar sounds.

Ss

Seema. *N.* Proverb. A short well-known pithy saying, stating a general truth or piece of advice. [*e.g. thakadu ga e tsene molete ga tee 'an ant-bear does not enter a whole once'*]

Segalo.₁ *N.* Tone. The use of pitch in a language to distinguish lexical or grammatical meaning.

Segalo.₂ *N.* Pitch. The relative highness or lowness of a tone as perceived by the ear.

Seka. *N.* Idiom. An expression that has a figurative or literal meaning. [*e.g. go hlanola direthe 'to run away'*]

Senoko se bulegileng. *N.* Open Syllable. A syllable ending with a vowel. [e.g. *lewatle* 'ocean' *lapa* 'family', *raga* 'kick']

Senoko se tswaletšeng. *N.* Closed syllable. A syllable that ends with a consonant. [e.g. *sekolong* 'at school' *at kerekeng* 'church', *toropong* 'at town']

Senoko. *N.* Syllable. A unit of pronunciation consisting of a vowel sound, with or without a surrounding consonant.

Senokogare. *N.* Nucleus. The central part of the vowel, mostly a vowel. [e.g. /u/ *rata* 'teach', /a/ *sekama* 'oblique']

Senokonoši. *N.* Syllabic. A unit of pronunciation made of one syllable.

Senokopedi. *N.* Disyllabic. A unit of pronunciation made of two syllables. [e.g. *seka*, *reka*, *raga*]

Senokophaphantšho. *Adj.* Suprasegmentals. Features of a unit of speech other than the consonantal and vocalic components. [e.g. *segalo* 'tone', *botelele* 'length', *kgatelelo* pitch]

Senokotee. *N.* Monosyllabic. A word made of one syllable. [e.g. *ja* 'eat', *nwa* 'drink']

Seripa sa ditekanetšo. *N.* Segmental tiers. Autosegmental level that include the features that define the segment articulated in the phonological representation.

Seripa. *N.* Segment. Discrete unit of speech that can be identified, either physically or auditorily.

Seripatee. *Adj.* Monosegmental. Consisting of one segment.

Seswantšho sa medumo. *N.* Spectrogram. A visual representation of the frequency, time and amplitude of speech waves.

Sethong sa puo. *N.* Place of articulation. The point of contact where an obstruction occurs in the vocal tract between an active articulator, and a passive articulator. [e.g. *pounameng* 'bilabial' *Menong* 'dental', *lelengwaneng* 'velar']

Setšea seswantšho sa medumo. *N.* Spectrograph. A machine used to measure and analyze the energy of waves.

Tt

Tatelano ya ditumanoši. *N.* Juxtaposed vowels. When two vowels are following each other.

[e.g. moengseatla 'hand', diaparo 'clothes']

Tatelano. *N.* Ordinal. A seven letters word used as an article or as a noun.

Tatelano.₂ *N.* Sequence. A unit of conversation that consist of two or more adjacent and functionally related turns.

Telelofatšo. *N.* prolongation. The extension of the duration of a sound. *[e.g. sello 'cries', me:tlwa'thon', mo:llo'fire']*

Tengwanafatšo. *V.* velarization. A phonological process where a non-velar sound is turned in to a velar sound.

Theledi. *N.* Glide. A sound that is similar to a vowel but does not function as the nucleus of the word. *[e.g. ngwana 'child', yena 'this one']*

Thutamedumo. *N.* Phonetics. The study and organization of speech sounds.

Thutapopomedumo ya dinoko. *N.* Segmental phonology. The study of how speech can be analyzed into discrete units, or segments, that constitute the basis of the sound system.

Thutokemo ya medumo *N.* Acoustics Phonetics. A subfield of phonetics that studies the physical properties of sounds, measured by pitch, amplitude and quality.

Thutokutlo ya medumo. *N.* Auditory Phonetics. A subfield of phonetics that studies the perceptions of speech sounds.

Thutopopadinoko. *N.* Phonotactics. The study of the rules governing the possible phoneme sequences in a language.

Thutopolelo ya medumo. *N.* Articulatory Phonetics. A subfield of phonetics that studies the articulation and ways that humans produce speech.

Thutupopamedumo. *N.* Phonology. A branch of linguistics that studies the organization of speech sounds.

Tirwano. *N.* Passivization. The transformation of a word/phrase into a passive. [e.g. rata 'like' → ratwa 'liked', bitša 'call' → bitšwa 'to be called']

Tlalongwalo. *N.* Velum. The soft membrane behind the hard palate, as a speech organ it is involved in the production of sounds such as: ngwana 'child', gae 'home', koko 'grandmother'.

Tlhahlomedumo. *N.* Speech Chain. A model of spoken communication that highlights the transformation of an intention in the mind of the speaker to an understanding of that intention in the mind of the listener

Tlogelo. *N.* Elision. A phonological process where a sound is deleted.

Timelelo e itšego. *N.* Underspecification. A phonological process where a sound is omitted in the underlying representation. [e.g. *ntau* –underspecify noun class = *tau*].

Tiro. *N.* predicate. The part of a sentence or clause containing a verb and stating something about the subject.

Tsela ya modumo. *N.* Vocal tract. The cavity where sound is produced.

Tsela ya moyakelelo. *N.* Airstream mechanism. The method by which airflow is created in the vocal tract.

Tsentšho ya ditumanoši. *N.* Epenthesis. A phonological process where a sound is inserted in a word.

Tumadipuo. *N.* Bilabial. Sounds produced by both lips. [e.g. *bala* 'read' *motho* 'person', *puka* 'book']

Tumagwaša.1 *N.* Fricative. Sounds produced with a partial closure of the airstream generation an audible friction. [e.g. /f/ fola 'get well', /sh/ shala 'remain', /s/ sekete 'thousand']

Tumagwaša.2 *N.* Affricatives. Sounds produced by the tip of the tongue against the back of the teeth. [e.g. /tš/ tšaka 'mine', /tsh/ tshalete 'money', /tsw/ tswara 'hold']

Tumainong. *Adj.* Dentals. Sounds that are preceded by the tip of the tongue and upper teeth. [e.g. thuto 'education' thaba 'mountain']

Tumakelelo. *N.* Liquid. Sounds produced with tongue producing a partial closure in the mouth, resulting in a resonant, vowel-like consonant. [e.g. lewatile 'ocean' rata 'like']

Tumakgoko. *N.* Glottal. Sounds produced by obstructing airflow in the vocal tract or, more precisely, the glottis. [e.g. /g/ gope 'again']

Tumakhutlo. *N.* Stops. Sounds produced by a complete closure of the airflow. [e.g. /t/ tate 'father', /p/ pata 'road', /k/ koloi 'car']

Tumakodu. *N.* Voiced Sound. Sounds produced with the vocal cords closed and vibrating. [e.g. /d/ dinoko 'segments' /ng/ ngwala Write; /m/ mosegare 'day']

Tumalelengwana. *N.* Uvular. Sounds produced at the uvular.

Tumammogo. *N.* Consonant. A consonant is a speech sound that is articulated with complete or partial closure of the vocal tract. [e.g. /f/ fofa 'fly', /r/ reta 'praise', /l/ lapa 'family']

Tumamogolonthago. *N.* Pharyngeal. Sounds produced with the pharynx.

Tumamolomong. *N.* Oral Sound. Sounds produced with the velum raised and air flowing through the mouth. [e.g. /b/ borotho 'bread', /k/ koko 'grandmother' /l/ leoto 'leg']

Tumankong. *N.* Nasal sound. Sounds produced with the velum lowered and air flowing through the nose. [e.g. /n/ naga 'land', /ng/ ngaka 'doctor', /m/ mollo 'fire']

Tumanoši tše gašitšweng. *N.* Unrounded vowel. Vowels produced with unrounded lips. [e.g. /s/ selepe 'axe', /i/ moreki 'buyer', /a, /abo 'distribution']

Tumanoši. N. Vowel. A speech sound produced by comparatively open vocal tract. [e.g. /e/ *legapu* 'watermelon', /a/ *apara* 'wear', /i/ *setsibi* 'professional']

Tumanošigarefase. N. Mid-low vowel. Vowels produced with a mid-low sound. [e.g. /e/ *metsi* 'water', /o/ *bolo* 'ball']

Tumanošigodimo. N. High vowel. Vowels produced with a high pitch. [e.g. /i/ *bina* 'dance', /u/ *buša* 'retun']

Tumanošigodimogare. N. Mid-high vowel. Vowels produced with a mid-low pitch.

Tumanošikgolo. N. Cardinal Vowel. Vowels produced when the tongue is in an extrema position, either front or back, high or low. [e.g. /i/ *fihla* 'arrive', /u/ *bula* 'open']

Tumanošipedi. N. Diphthong. A sound formed by the combination of two vowels in a single syllable [e.g. /et/ *leihlo* 'eye', /ea/ *seatl* 'hand', /ee/ *tee* 'one']

Tumanošitee. N. Monophthong. A vowel that has a single perceived auditory quality [e.g. /a/ *lapa* 'family', /e/ *ema* 'stand', /u/ *ruta* 'teach']

Tumanošitharo. N. Triphthong. A union of three vowels pronounced in one syllable.

Tumanošitlase. N. Low vowels. Vowels produced with a low pitch. [e.g. /e/ *wela* 'fall into', /a/ *akaretša* 'conclude', /o/ *boloka* 'burry']

Tumapuoinong. N. Labiodentals. Sounds produced by the lower lip and the upper teeth. [e.g. /f/ *fofa* 'fly']

Tumapuonameng. N. Labial sound. Sounds produced at the lips. [e.g. /b/ *bofa* 'tie', /f/ *fetša* 'finish', /m/ *metša* 'swallow']

Tumaratha. N. Percussive. Sounds produced with one speech organ striking another with force.

Tumarinini le magalagapeng. N. Alveopalatal. Sounds produced at the beginning of the hard palate and the end of the alveolar. [e.g. /sh/ *leshoko* 'labour pains', /tš/ *tšla* 'those']

Tumarinini. *N.* Alveolar. The membrane behind the teeth before the hard palate. As an organ of speech it is involved in the production of sounds such as /n/, /l/.

Tumarininingthoko. *N.* Latero-alveolar. Sounds produced with air flowing through the sides of the tongue and the tip touching the alveolar. [e.g. /r/ *rata* 'like']

Tumatheko. *N.* Coronal. Sounds articulated with the flexible front part of the tongue against a passive articulator. [e.g. /d/ *dino* 'drinks', /n/ *noga* 'snake', /l/ *lahla* 'throw away']

Tumathunya. *N.* Plosives. A consonant in which the vocal tract is blocked so that all airflow ceases in its production. [e.g. /t/ *tea* 'tea', /p/ *pasa* 'ID' /k/ *katse* 'cat']

Tumatlalongwalo. *N.* Velar. Sounds articulated with the back part of the tongue against the soft palate. [e.g. /n/ *nna* 'me' /l/ *lepara* 'cane']

Tumatu. *N.* Voiceless sound. Sounds produced with the lack of vibration of the vocal cords. [e.g. /s/ *sekepe* 'boat', /t/ *tala* 'green', /f/ *fologa* 'get off']