

https://dspace.org/

Chemistry in Sepedi: Translation strategies for success

Maleka, Raisibe Gloria

2007-02-22T11:14:13Z
http://hdl.handle.net/10539/2079

Downloaded from a DSpace repository. https://dspace.org/

CHAPTER 4: DATA ANALYSIS

DATA INTERPRETATION AND ANALYSIS

4.1 Background information regarding the work of P.T. Pare and F. Ntake

Mr. Pare taught Science in English to Standard 5 (Grade 7) pupils from 1985, Standard 6 (Grade 8) in 1986 and up to 1993 at Bopedi Bapedi secondary school which is a government school in Marishani, Limpopo. In 1997 he started teaching through English and Sepedi to a Standard 2 and a Standard 5 class in St Mark's College, which is an Independent Anglican school in Jane Furse, Limpopo. He also taught Physical Science at PROTEC in Phalaborwa from 1998 through to 2001. During the time that he worked at Bopedi Bapedi secondary school, he realised that he was using much of the time in Science classes trying to explain basic English expressions and that the learners responded well when he explained the expressions in Sepedi. From 1991 onwards, he started recording translation equivalents for English terms together with Fanuel Ntake, an educator of Physical Science and also by consulting his learners as well as English-Sepedi, English-Portuguese and English-Afrikaans dictionaries. He started translating Matric examination papers for Chemistry, which were compiled into a book that was published in 2001 by the Pan South African Language Board (PanSALB).

The motivating factor behind this were “the problems that my students were having in understanding English” and to indicate that Sepedi had “the terminology necessary to serve as a vehicle for conveying the content of the subject field” (e-mail correspondence, 29 June 2004). Pare’s corpus consists of 500 terms. These terms are words from general vocabulary and from chemistry, physics and mathematics.

4.2 Method of data analysis

In this study, my first aim was to investigate the translation strategies that were used in the translation of *Questions and Answers: Matric Physical Science* into one of the South African languages, and the effects of these strategies on the target text and its function. The terms are classified according to the translation strategy used. These classifications show which strategies represent domestication and foreignization (Venuti, 1995) and whether the strategies used were an attempt to adapt Sepedi as an LSP for science or whether they may prove successful in facilitating scientific knowledge through the mother tongue. This type of analysis is performed not to evaluate the quality of a given translation but to understand the decision-making process underlying the product of translation and to infer from it the translation norms adopted by the translators.

Translating a text from one language to another usually requires that a choice is first made between two basic translation strategies categories, domestication and foreignization. Domestication means making the text recognizable and familiar and thus bringing the foreign culture closer to the reader in the target culture, while foreignization means the opposite, taking the reader over to the foreign culture and making him or her feel the cultural and linguistic differences. The choice of strategy may result in source-culture bound translation – so-called foreignization, target-culture bound translation-so called domestication or in a 'hybrid' where the translation is a product of a compromise between two or more cultures. This choice between domestication and foreignization is also linked to questions of ethics: should the translator be accountable to the source or target culture, and to what extent? If target cultural conventions are followed in the translation process, the text will be readily accepted in the target culture (Venuti,1995).

A translation which adopts a domesticating approach, on the one hand, illustrates how the target culture's expectations and values are considered to be of greater importance than those of the source culture. Translations which draw more heavily on the foreignizing strategy, on the other hand, demonstrate how translators often attempt to maintain the foreign flavour of the source culture in the target text (Venuti, 1998:67). The next section looks at the translation strategies that were identified in the translated text:

(a) Indigenous equivalents

Only the following indigenous equivalents were supplied. In this case, there is no problem of non-equivalence between the source and target languages, as the TL possesses an indigenous (ready) equivalent of the SL term.

English	**Sepedi**
Alcohol	setagi
Cell	lelahle
Compound	tlhakantšhetšo
Curve	kobi
Decolourised	galošwa
Diagram	seswantšho
Dissociate	tlogelana
Dissolve	tologa
Displace	ntšha
Distill	hlotla
Energy	mafolofolo
Entries	ditsentšhwa
Equation	tekanelo
Equilibrium	tekatekanyong
Friction	kgohlano
Fuels	dibešwa
Graph	mothalopalo
Heated	huthumatšwa
Lead	morodi
Metal	tshipi
Neutral	magareng
Precipitate	sethihi
Pressure	kgatelelo
Rate	lebelo
Reactants	dikgohlagani

Reaction	kgohlagano
Reducing agent	sefokotši
Reduction	phokotšo
Soluble	tologa
Solubility	tologo
Solution	setološwa
Sulphur	sebabole
Vertically	bogodimothwii
Water	meetse
Weight	boima

In some cases the translators used the existing words, which do not seem equivalent as they first seem. The word “energy” was translated as “mafolofolo”. In Sepedi, when we say that “motho wo o na le mafolofolo” we mean that “this person is active”. In this case the term “mafolofolo” can be translated back as “being active”. A dictionary definition of the word “energy” is “the physical and mental strength that makes you able to be active” (Longman Dictionary of Contemporary English, 2001:453). But looking at the technical definition of the term “energy”, it means “ the capacity for, power of, doing work “(Hornby, A.S., Cowie, A.P. and Gimson, A.C, 1987: 284).

For the term “heated” (which means to make something become warm or hot, (Longman Dictionary of Contemporary English, 2001: 663), it was translated as ‘huthumatšwa’. The term ‘ huthumatšwa’ is a regional dialect of the term ‘ruthetšwa’ which means to ‘to be warmed’

For words that are specific to the science field, the translators coined new words to transfer scientific and technical knowledge to the mother-tongue linguistic community but they also used words that already existed in the Sepedi corpus. In fact they combined words to create new meanings, which is slightly different than having ready-made equivalents. Examples are:

English	Sepedi
Activation energy	mafolofolo- tsošeletšo
Balanced equation	tekanelo tekanywa

Conjugate pair	tswalano bobedi
Kinetic energy	mafolofolo-tšhišinyego
Potential energy	mafolofolo-kgonagalo

With the following terms, the translators tried to circumvent the lack of terminology by using circumlocutions. Fewer circumlocutions occur and this may indicate that the translators were aware of the requirements of term status (length restriction).

Emf	ktm (kgapeletšo ya tlhohleletšo ya mohlagase)
Energy complex	mafolofolo a tharanego ye e tsošeletšegilego

(b) Deverbatives

According to van Wyk, Groenewald, Prinsloo, Kock and Taljard (1992:67), deverbatives are *nouns* which have been derived from verbal stems. They can be formed in any noun class by placing (prefixing) the *class prefix* of the particular noun class to the left of the verbal stem and changing the *verbal ending* **–a** to **-i** or **–o.** For Lombard, van Wyk and Mokgokong (1985: 62), the verbal endings are also regarded to as *productive* endings. Deverbatives are not formed with the endings –*u* and –*e*. In this case, most of the deverbatives were derived from the noun class 9. When deverbatives are formed in class 9, the prefix **n-** is prefixed to the verbal stem and the verbal ending changes to -ô.

An example of deverbative term is “reduction” which was translated as “phokotšo”. The word “phokotšo” is a deverbative with the ending –o.

Noun class	**object concord**	**verbal stem**	**verbal ending**	**deverbative**
9	n-	-fokotš-	-a	phokotšo

Sound strengthening occurs with deverbatives in class 9. According to van Wyk, Groenewald, Prinsloo, Kock and Taljard (1992:28), when the object concord (-n-) is added to the left of certain verbal stems *sound strengthening* (occluvisation) occurs. Looking at this example: “phokotšo” which is derived from the prefix (n-) plus the verbal stem -fokotš- and the verbal ending –a, and after sound strengthening has occurred, a voiceless dentilabial fricative –f- changes to a bilabial plosive –ph- and the prefix falls away and the verbal ending changes to -o.

Another example of a deverbative is “pressure” which was translated as “kgatelelo”. The word “kgatelelo” is a noun derived from the verbal root –gatelel- (which means to “press”) and a suffix –a. Below is the structure of a deverbative “kgatelelo”.

Noun class	**object concord**	**verbal stem**	**verbal ending**	**deverbative**
9	n-	-gatelel-	-a	kgatelelo

For a word such as “concentration” which was translated as “tlalo”, “tlalo” is a noun derived from the verb” tlala” which means “to become full”. The verb “tlala” was then deverbatised by adding the verbal ending -o to become “tlalo”. Looking at the equivalent term for “concentration” the term “tlalo” which can be translated back as “the state of being full” which means a different thing as compared to the definition of “concentration” in the scientific field. In science, the term “concentration” would mean “the amount of a substance contained in a liquid.” (Longman Dictionary of Contemporary English, 2001: 275). Concentration is an antonym of dilution.

When the nominal root consists of two or more syllables (polysyllabic) the class prefix is not apparent. For monosyllabic words such as *nko* (nose) the class prefix will be n- plus the monosyllabic nominal root –ko. It is apparent from the table above that the class prefix of nouns in class 9 is not always discernible.

(c) Term-formation through transliterations

New scientific and technical terms are formed via a process of transliteration by adapting the phonological structure of the loan word (English word) to the sound system of the borrowing language (Sepedi). Transliterations are much higher than expected. According to French and King (1997:89), transliteration is a mechanism for term-formation which highlights a deep-rooted philosophical controversy. This difference of opinion centres around the need to make international information accessible (in a non-international language) in the most "internationalized" form, versus preserving the language and keeping it pure. Examples of transliterations are as follows:

English	Sepedi
Acid	esiti
Allotropes	dialotropo
Aluminium	aluminiamo
Ammonium	amoniamo
Ammonia	amonia
Atom	atomo
Base	peisi
Bromothymol	bromothaemol
Calcium	kalasiamo
Carbon	khabone
Carbonate	khabonate
Carbonic	khaponiki
Catalytic	katalise
Cathode	katode
Chemical	khemikhale
Chemistry	khemise
Chlorate	tlorate
Chloride	tloride
Chlorine	tlorine
Chlorite	tlorite
Chloroform	tlorofomo

Column	kholomo
Copper	koporo
Electron	elektrone
Electrolytes	dielektrolite
Endothermic	endothemiki
Ester	estere
Ethyl	ethaele
Exothermic	eksothemiki
Formula	fomula
Funnel	fanele
Gas	gase
Halogen	halotšene
Hydrogen	haetrotšene
Hydroxide	haetrokside
Iodide	ayotide
Iodine	ayotine
Ion	ayone
Isomers	diisoma
Kinematics	kinematiki
Laboratory	laboratori
Layer	leyara
Mass	mmase
Methyll	methaele
Molecules	dimolekule
Monoclinic	monotliniki
Nitric	nitriki
Nitrogen	naetrotšene
Oxygen	oksitšene
Paraffin	parafene
Phosphate	fosfate
Plastic	plastiki
Platinum	platinamo
Proton	protone
Redox	oksiphoko
Rhombic	rompase
Silver	silibera
Sodium	sodiamo
Sulphate	salfate
Sulphide	salfide
Sulphite	salfite
Temperature	themperetšha
Test-tube	tšhuputeki
Tube	tšhupu
Zinc	sinki

Pronunciation is a very important tool in translating Sepedi words and is fixed. For example, the vowel *a* in Sepedi will always be pronounced as *a.* However, this is a different case in English. In English the vowel *a* can be pronounced in many different ways. In words such as yard (a is pronounced as *a),* cat (pronounced as e), game (pronounced as ei) and small (pronounced as o). The same applies to the vowel *u, which* can be pronounced differently depending on its use. For example in the word "full" it is pronounced as *u* but in the word "bud" it is pronounced as *a.* For words such as "sulphate", "sulphide" and "sulphite", the sound "u" was changed to "a". In Sepedi the use of "u" in terms such as "sulphate" will be pronounced as "soolphate" which is a different sound altogether. The translators searched for the nearest sound and "a" was suitable.

Another example of a transliterated term is "layer" translated as "leyara". In Sepedi there is an existing equivalent word "letlakala" but this is a word from the general vocabulary. The word "letlakala" can be translated back as "a peel" which will not necessarily mean the "layers of chemicals" which are applicable to Chemistry.

In Sepedi, most words are borrowed from English and Afrikaans. When a word is borrowed the sound structure is adapted to correspond with that of Sepedi. For example, words such as "chemical" and "ion" translated, as "khemikhale" and "ayone" respectively, did not have endings in English. Northern Sotho basically has an open syllable structure; the syllables usually end with vowels. These sounds are added because Sepedi words cannot end in a consonant. It's a phonological rule that the word has to conform to.

(d) Translation by loan word (direct borrowing)

When translating, Ntake and Pare used "foreignizing strategies" such as using a loan word rather than searching for the Sepedi equivalent. Translation by means

of a loan word is a strategy in which the English spelling has been retained (Baker, 1992). A term is used in its original form without transliteration. The term is embedded in the target language without changing or adapting any part of the original source language term. This strategy, which Chesterman (1997:94) classifies as the use of a loan, and which is also called transference or direct transfer, is sometimes not even considered a translation strategy at all (Newmark 1988:81). It preserves the exotic feeling of the source text and thus contributes to a foreignized target text. The preservation of the exotic feeling might also indicate a lack of understanding of the source language concept.

English	**Sepedi**
Alkaline	alkaline
Alkane	alkane
Alkene	alkene
Bromo	bromo
Bromine	bromine
Bromide	bromide
Butane	butane
Dibromo-butane	dibromo-butane
Dibromo-ethane	dibromo-ethane
Ethane	ethane
Ethanoate	ethanoate
Ethanol	ethanol
Methanoate	methanoate
Mole	mole
Propane	propane
Propene	propene

Even though these words are loaned from English into Sepedi, a change in pronunciation occurs. The words are given a Sepedi pronunciation. In English, the sound *k* for “alkaline” will be pronounced as *kh.* In translating terms such as “alkaline”, the aspirated plosive *kh* was de-aspirated, and changed to the voiceless velar plosive *k.* In translating these words, the translators searched for the nearest sound. The translators did not change the spelling because they were trying to comply with the rule that when one translates using loan words, the English spelling has to be retained.

(e) Possessive constructions

Morphologically, the possessive particle is *polymorphematic*. Polymorphematic words always consist of *at least two* word aspects (Lombard, van Wyk and Mokgokong, 1985: 7). The word aspects may also be subdivided into two types, namely ROOTS (OR cores, LEXICAL MORPHEMES) and MORPHEMES. A polymorphematic word consists of a *concordial morpheme* as prefix followed by a *possessive root –a*. The concordial morpheme refers to the possession according to class" (Lombard, van Wyk and Mokgokong, 1985: 172). The possessive construction of Sepedi consists of a possessive concord which refers to a possession (noun) plus a possessive noun. Each noun class has its own possessive concord.

In this case, the terms in the original English list are mostly multiword terms or compounds consisting of two morphemes. These complexes are translated by circumlocutions containing Sepedi elements as well as English elements or transliterations. The translated phrases consist of two nouns combined by a possessive conjunction such as ***tša, la, ya, sa, wa*** etc. The following are examples:

English	**Sepedi**
Ammonium carbonate	khabonate ya amoniamo
Ammonium chloride	tloride ya amoniamo
Ammonium sulphate	salfate ya amoniamo
Amorphous sulphur	sebabole tlhoka sebopego
Calcium hydroxide	haetrokside ya kalasiamo
Carbon monoxide	**monokside wa khabone**
Carbon tetrachloride	tetratloride ya khabone
Carbonate ion	ayone ya khabonate
Carboxylic acids	diesiti tša khapoksi
Chemical name	leina la khemikhale
Electron acceptor	seamogedi sa elektrone
Endothermic reaction	kgohlagano ya endothemiki
Ethanoic acid	esiti ya ethanoiki
Halo-alkanes	dialkane tša halo
Hydrochloric acid	esiti ya haetrotloriki
Hydrogen-sulphide	salfide ya haetrotšene

Le Chatelier's principle	molao wa Le Chatelier
Monoclinic sulphur	**sebabole sa monotliniki**
Nitric acid	esiti ya nitriki
Salt bridge	leporogo la letswai
Sodium hydroxide	haetrokside ya sodiamo
Sulphur dioxide	**diokside tša salfa**
Van der Waal's forces	kgapeletšo ya Van der Waal

The highlighted terms are selected for an analysis to show how these terms were translated:

Class	Concordial morpheme	Possessive root	Possessive article	Examples
3	w-	-a	wa	monokside **wa** khabone
10	tš-	-a	tša	diokside **tša** salfa
7	s-	-a	sa	sebabole **sa** monotliniki

(f) Blending

Ntake and Pare have also used other term creation processes such as blending**.** According to Crystal (1992: 44), blending is a process in grammar or vocabulary which takes place when two elements that do not normally co-occur are combined into a single linguistic unit (a blend). For Hartmann and Stork (1972: 28), blending is a type of word formation in which two or more free morphemes are combined to form a new word which incorporates all the meanings of its constituents. A free morpheme is a morpheme which can be used on its own as a word with a distinct meaning. A free morpheme can occur unattached. An example of blending is "redox" which is a compound of two chemical processes: 'reduction' and 'oxidation'. The term "redox" is the name for a chemical process whereby electrons are transferred from one substance to another, and it was translated as "oksiphoko". "Oksiphoko' is a first and first syllable blends from "**oksi**tšenefatšo" and "**phoko**tšo". Oxidation was translated as "oksitšenefatšo" and "reduction" was translated as "phokotšo".

(g) Neologisms

Neologism is described as the creation of a new lexical item as a response to a changed circumstances in the external world, which achieves some currency within a speech community, also called coinage (Crystal, 1992: 269). For him, only some neologisms will become permanent features of the language, but it is never possible to predict which will stay and which will die out. An example of a neologism is the word "table" which was translated as "tlhopo". From the existing corpus of Sepedi words, the word "table" has always been translated as "tafola" which is a loan word, borrowed from the Afrikaans word "tafel". In the science field the word "table" does not necessarily mean "a flat board supported by one or more legs" but instead means a combination of columns and rows. The word "tlhopo" is a new word derived from the verb "hlopa" which means "to group".

(h) The use of suffixes *–fatšo* and *-šo* for scientific processes

The translators used the coined and/or existing words plus suffixes such as –***fatšo*** and –***šo*** to show the scientific processes. For example, "neutralization" is a term for a chemical process which was translated as "garefatšo" comprised of the stem -gare and the suffix -fatšo". The stem "gare" in general terms means "middle", which is a different term altogether. Scientifically, the term "neutralization" means the reaction between an acid and a base to form a salt and water and the reaction would be neutral i.e they are not acidic and not basic which is a different concept altogether. The word "neutral" in chemistry means neither acid nor base. Other examples of scientific processes are as follows:

English	**Sepedi**
Neutralization	garefatšo
Oxidation	oksitšenefatšo
Reduction	phokotšo

The chemical process "phokotšo" is a noun derived from the verb "fokotša" which means, "to reduce". In scientific terms, "reduction" means the process during

which electrons are received by a substance, thereby resulting in a decrease in oxidation number. "Oxidation", on the other hand, means a process during which electrons are donated by a substance, as a result of which its oxidation number increases.

4.3 **Initial norms**:

It is clear that Ntake's and Pare's choice of translation strategies enabled them to realize their initial norm as translators, i.e. to effect a compromise between the English source system and the Sepedi target system. In *Questions and Answers: Matric Physical Science*, Ntake's and Pare's aim is to encourage and promote the use of Sepedi as a medium of instruction. For them, the problem of introducing second languages at an early stage of schooling will continue to pose challenges to indigenous language speakers. This is in line with the University of the Witwatersrand's Language Policy which states that "currently millions of South Africans do not complete their schooling, partly because they are taught and assessed through the medium of English or Afrikaans and have no access to concepts in a language that they fully understand. To overcome this legacy, it is essential to develop African languages of South Africa in order to provide equal access to education" (Adopted on 14 March 2003).

Ntake and Pare suggest that the learners should be enabled to achieve CALP (Cognitively Advanced Language Processing) in the primary language before using the second language as sole medium of assessment. The motivating factor behind the translation of these examination papers was to elevate African languages, specifically Sepedi, to the same functional level as English and Afrikaans, providing the language and its speakers with the same opportunities and bestowing on them the same privileges that Afrikaans and English enjoyed prior to 1994. From the personal conversation that I had with Mr. Pare, and e-mail correspondence, it is clear that he was convinced that the pupils communicated and responded much better when Sepedi was used. The

motivating factor, according to Pare (e-mail correspondence, 29 June 2004) was “the problems that my students were having in understanding English”.

One of the difficulties that Pare indicated during our conversation was the fact that sometimes they did not know which strategy to use in translating the chemical concepts that have the same prefix, such as sulphite, sulphate and sulphide. Sometimes they (Pare and his colleague, Mr.Ntake) did not agree on the strategy to use: to use indigenous words or to make use of transliterations. As a result, the translation strategies were used randomly, that is no specific strategy was used consistently for certain types of terms. The translators used loan word at certain times, and transliterations and blending at others.

In conclusion, translating scientific texts does not only involve searching for translation equivalents in the target text, but understanding chemical processes and concepts. The translators have used various translation strategies ranging from the use of indigenous equivalents, translation through transliterations, translation through borrowing, coining new words through neologisms and blending. However, there is no strategy which was used consistently for certain terms**.** The use of indigenous equivalents and transliterations make up a higher percentage and this may be ascribed to an attempt by Ntake and Pare to adapt Sepedi for use as an LSP for Science.

4.4 ANALYSIS OF QUALITATIVE DATA

The qualitative data gathered through group interviews, face-to-face interviews, observations and open-ended questions from the questionnaires were analysed and interpreted qualitatively. This method of analysis, according to Gay (1996: 227) involves “making sense out of an enormous amount of narrative data”. Responses were interpreted and explained with the aim of comparing them with the assumptions derived from the literature review. The number of participants was too small to be analysed statistically or to be computerised. Four secondary schools where Chemistry is being taught were approached to contribute to this research project. The second aim of this research project was to establish whether the translation strategies used helped in developing Sepedi to be used as a medium of instruction in high schools. This question was asked with the aim of establishing the overall picture of the respondents with regard to their attitudes towards the translated examination papers which will eventually mean that they have to use Sepedi in teaching and learning Chemistry.

4.4.1 Learners’ responses

From the results obtained through interviews with various groups of learners and their educators, it was evident that most learners support the use of English in all subjects. In some of the schools that were approached to make contributions towards this project, there is a strong belief that the learners would learn more effectively in English as compared to Sepedi. The learners feel that the translated examination papers are not necessary and below are some of their responses:

> For the pride of our country it would be a good idea to have materials translated into Sepedi, but it would surely put most learners at a distance when considering the current state that we find ourselves in where English is used for much more than other languages. I do not support the idea of Sepedi in science (**quote 1**).
>
> "I wouldn't prefer the translated works because I have a problem with Sepedi itself. I have basics in English so it would be very difficult for me to learn in Sepedi (***quote 2***)."
>
> "These are new words to me, so they increase the number of terms that I must know. Thus, it consumes time because I still have to learn the language then learn the concepts of Chemistry" (**quote 3**)

An interesting issue that arises from the third quote when the learner says that he/she does not wish to have the examination papers translated and to be taught in Sepedi is the fact that he/she "has to learn the language first" but what the learner is failing to understand is that since English is not his/her first or mother tongue, he/she has to learn English as a subject first before he/she can apply the knowledge to Chemistry. Whilst white pupils enjoy the luxury of being taught in their mother tongues, the black pupils first have to grapple with language issues before dealing with the content.

From the interviews and the observations it became clear that most learners in both urban and semi-urban areas had problems with the language of instruction, which was English. Proficiency in this language was very low and some learners were unable to express themselves either orally or when they wrote their answers on the questionnaires. These are some of the responses that were obtained:

> "This one other words are not in North Sotho they tried but you can hear that there is a little bit of

> English in those words. So its more complicated in North Sotho" (***quote 4***)
>
> "It is not important to have the chemical concepts translated into Sepedi because out side we are not going to communicate with Sepedi together with different people. When come to element English sound better" (***quote 5***).

But surprisingly, even though these learners could hardly communicate effectively in English, they feel that English should continue to be used as the medium of instruction because of the prestige that is afforded to it. The learners' knowledge of English is seen as a status symbol. This confirms that speaking English fluently shows the class that one belongs to. It was evident that those learners who speak fluent English are from the educated middle class group attending private schools as compared to their public school counterparts.

Most learners prefer to learn Chemistry in English because English is an international language, and it would open opportunities for them to study abroad. They feel that they cannot go anywhere with Sepedi. They believe that Sepedi will remain an inferior local language. Furthermore, they feel that other languages especially European languages are superior to their language. One learner mentioned that,

> we cannot afford to learn Chemistry in Sepedi because what will happen if I know the concepts in Sepedi and I am offered a scholarship to study in Britain or to attend an international conference, I won't be able to present my paper in Sepedi (***quote 6*****)**

In spite of the very negative perception of Sepedi as a language of learning and teaching for Chemistry, some of the learners mentioned that they would learn more effectively in Sepedi than in English. It was interesting to note that two of the learners who were in favour of the use of the mother tongue in scientific fields communicated their ideas in Sepedi. These are their responses towards the interview questions:

> Sepedi se tla nthuša go kwišiša mantšu le go kwišiša English ka ge ke ithuta Chemistry. Ke hwetša gore e bothata ka ge barutiši ba bantši ba šomiša mantšu ao e lego gore ga re a kwišiše, ga ba re hlalosetše gore mantšu a bolela ka eng (***quote 7)***.

The above quote can be translated back as:

> "Sepedi will enable me to understand English much better when I am learning Chemistry. I find it very difficult because most of the teachers use words that we are not familiar with, without explaining their meanings".

Below is another response from the learner who is in favour of the translated examination papers and the use of Sepedi as a language of learning and teaching Chemistry. The learner communicated the idea in Sepedi:

> Ke dumela gore diphetolelo tša Sepedi di kaone gore le ge o tsene ka examination room o kgona go kwišiša gore go bolelwa ka eng (***quote 8)***.

Back-translated:

> "I believe that the Sepedi translations are better because when you sit for the examination, you will understand what the paper is about".

The use of Sepedi in completing questionnaires is a clear indication that they have positive attitudes towards the language, as they feel proud to use it. There is a strong belief among these learners that they would learn more effectively in their mother tongue as compared to English.

From the data collected, it was clearly apparent that there is more than one language used in the classroom situation. The educators switch to Sepedi to ensure that the learners understand the subject effectively. Some of the learners that were interviewed believe that even though their educators switch between English and Sepedi, they are not familiar with some of the scientific words that are used in the translation and they do not wish to learn Chemistry in Sepedi.

Although it is obvious that Sepedi is being used, the learners still feel that the translation of these papers was unnecessary especially when they consider terms like “atom” “aluminium” and “sulphur” which were translated as “atomo”, “aluminiamo” and “sebabole” respectively.

It is clear that the learners have problems in understanding terms that were loaned from English without being nativised and those that were transliterated. With regard to the translation of the terms such as “atom” and “aluminum”, some learners said:

> “These are just English terms. We cannot call this translation. They have just borrowed the term and added a suffix” (***quote 9***)
>
> “I think that these translations don’t make any difference since they are too direct, making it even harder for you to understand. These translations are a bit complex” (***quote 10***).

The learners showed differing responses towards the use of certain translation strategies. For example, they could not agree on the translation of “sulphur” into “sebabole”. Some learners felt very lost and confused because they have never come across the use of “sebabole” in their science experiments. Others were in favour of the use of the word “sebabole” for “sulphur” because they know “sulphur” as a “yellow powder with an odour like that of a rotten egg”.

Even though learners showed negativity towards the terms that were translated through the use of a loan word, transliteration and neologisms, they responded positively to the terms that were translated through the use of existing indigenous equivalents and in most cases these terms were familiar to them. These include words such as “tshipi” for “metal”. These are some of their responses:

> “It is quite common that a Pedi learner knows that “metal” in Sepedi is “tshipi” (***quote 11***)

> "It's better to me because I understand the word and I know that "metal" in Sepedi is "tshipi". "Tshipi" is a very common phrase" (***quote 12***)
>
> "This is a very familiar translation and it will help a lot. It makes it easier to understand. You immediately know what they are talking about" (***quote 13***).

The finding from these results was that the translators should use indigenous words only instead of transliterating or loaning from other languages. This suggests that our local vernacular languages will not develop as long as we still borrow from other languages. This suggestion raises a question: how does a language then develop? I subscribe to the view that loan words can fill terminology gaps. The mechanism for extending the use of a language to other fields has historically meant borrowing. It is evident that the renaissance of English was a result of the introduction of many Latin and Greek words. Although it is basically a Germanic language, this indicates that no language is so self-sufficient as to shun borrowing.

It was evident that the physical location has a bearing on the attitudes of learners and educators. Most of the learners from semi-urban schools showed a preference for the use of translated works, which will eventually mean learning and teaching chemistry in Sepedi. The learners felt that it was important to have the scientific concepts translated:

> it is good to use Sepedi phrases because we will pass tests more than we expect (***quote 14)***
>
> we will understand faster what the educator tries to say when explaining the meaning of words. Because many learners will realize what these terms are all about (***quote 15)***
>
> I know and understand that we perform very well in Sepedi as a subject which is our mother tongue. We obtain 100% but we never get 100% in chemistry and physical science because sometimes we do not

> understand what the teacher says until he explains in Sepedi (***quote 16)***

To conclude the analysis of the data obtained from the learners' responses, it is clear that learners fail to learn effectively through the sole medium of English but they refuse to accept that this is a question of language. The use of English as a medium of instruction in secondary and tertiary institutions has resulted in the construction of generally negative attitudes towards Sepedi. The overwhelming negative responses of the learners who indicated that Sepedi is not capable of functioning effectively in educational situations came from both urban and semi-urban schools. English as a language is associated with superiority and these results show that when more and more people prefer to learn in English only in schools, the possibilities are that when they reach university they will prefer to use English and this is in fact detrimental to the development of African Languages, particularly Sepedi. This is in contrast to Moyo's (2002: 159) argument, that it is only through the study and development of indigenous local African languages beyond grade 12 that local mother tongue languages can become more scientifically sophisticated. This may take time – but at present, learners are not supporting the effort.

4.4.2 The educators' responses

According to the then Minister of Bantu Administration and Development of Bantu Education, "language remains the tool through which developments are carried through to fruition" (Honourable M.C. Botha cited in Duminy, 1967: xiv). He continued to argue that,

> In all proposals for educational advance the teacher is the kernel and of great importance. The quality of the teacher largely determines the quality of the education.

This section focuses on the responses of the educators to the question of whether the translations would make it easier for them to teach Chemistry more

effectively through the use of Sepedi as a language of learning and teaching. It is interesting to note the results where one might assume that the educators would be willing to use their vernacular languages because they understand what their learners are experiencing in the classroom situation, but this is not the case.

Some educators from the semi-urban secondary schools who contributed towards this project mentioned that they experienced difficulty in explaining concepts to their learners. It was mentioned that the learners do not really understand the concepts the first time. One educator mentioned that the learners fail dismally for the first three months because they are not familiar with the language that is being used. He stated that once he realizes that the learners are not responding to what he is presenting, he switches to the mother tongue, which is linguistically called code-switching. The results have shown that Sepedi is also used in class for educators to express themselves effectively and for learners to get a good understanding of concepts.

One of the educators who was interviewed who was in favour of the translated work suggested that,

> it would be very helpful and handy. The learners will have the opportunity to refer to both English and Sepedi versions which has always been the case with Afrikaans. The Afrikaans-speaking people had the opportunity to write their examinations in their own mother tongue and could still access the English versions (***quote 17)***.

He suggested that the dictionaries should be distributed first so that the learners would familiarize themselves with the terms used. When starting with the book, this might be problematic. Perhaps they should be given a chance, as the situation might change with time. Perhaps it might be necessary to have the terms compiled into a dictionary which would explain the words.

However, it is not only learners who showed negative attitudes towards the translated examination papers. Some of their educators felt the same way. The following are some of the responses received from the educators:

> if we have to teach our students in Sepedi or using the translated materials, the learners will know and understand the concepts in Sepedi (***quote 18)***.

> I find this exercise futile particularly when we talk about this generation. This generation is faced with many factors. The media such as televisions and radios influences them. English is a unifying factor, people across the country can relate to each other without difficulties (***quote 19***).
> We should accept that we are realizing and introducing this at a late stage. We cannot allow our learners to learn in Sepedi because there is no terminology to be used at secondary level. There is no way our African languages can develop as long as we still borrow from other languages. The learning is not necessarily about the language but understanding the concepts (***quote 20***).

The educator cited on quote 20 has a purist approach to language. Purism is "an attitude towards language which disapproves of deviations from certain grammatical rules, of neologisms and borrowings from other languages" (Hartmann and Stork, 1972: 190). According to Mutasa (2002: 244), a living language's dynamism lies in its receptivity and its inability to subscribe to linguistic purism. The above statement that "there is no way our African languages can develop as long as we still borrow from other languages", is an attempt to preserve the status quo of the language and it raises many questions. One begins to ask what exactly translation is. Many people do not really understand what the process of translation involves. From their understanding, translation should involve the use of indigenous words, which then raises the question of whether we have the indigenous equivalent words that can be used in all domains because there is no language which is self-sufficient. This is an indication that secondary school educators irrespective of their years of working

experience and area believe that Sepedi will not develop to the same level as English.

From quote 20, the educator believes that "we should accept that we are introducing this at a later stage" and a follow-up question was then posed to the learners during group interviews, *"Would they choose to learn in Sepedi or English if Sepedi was to be introduced at the initial stages of schooling through to tertiary?"* One of the learners mentioned that,

> even if Sepedi was introduced at an early stage through to tertiary, he will still opt for English since education is a right. Everybody has the right to choose which language he/she wants to learn through (***quote 21***).

From my understanding, this would enforce the law of ethnicity where each group would be allocated its school according to the language preference. From the above statements it is true that as long as the educators and the learners have an aversion to Sepedi, it will never be easy to use or learn through it.

One of the educators who was in favour of the translation of these examination papers believed that the reason most people have a negative attitude towards the use of African languages in education is because,

> the use of African languages as media of instruction is still associated with the Bantu Education Act of 1953. This rule came from the oppressors where our black children were forced to learn in African languages. But this situation must change because now the idea of using African languages in education is brought by the government that was democratically elected by us. I will recommend the translations of materials but I believe that people on top will have to push things forward (***quote 22)***.

From the above quote, it is apparent that previous laws have contributed to the building of generally negative attitudes towards learning and teaching in African

Languages. But there is a strong belief that this situation can change. The learners, on the one hand, should be open to explain and express themselves in their own languages. On the other hand, the examiners should allow them to write in their own languages, which has always been the case with Afrikaans. The educator suggested that we should start having our examination papers in English and Sepedi so that the learner will have the opportunity to read both English and Sepedi. If a learner does not understand a concept in English, he/she will access it in Sepedi.

From an informal conversation that I had with one principal during my introduction, he mentioned that the issue of having English and Sepedi at secondary level would help their learners to perform better in their studies. He supports the idea of having these papers translated because every person will understand and express himself or herself in the language he/she has a good grasp of but for him this will really take some time. He continues to argue,

> Language plays an important role in education and other spheres. In most cases, you find that the learners are still struggling with the language while at the same time they have to understand the concepts conveyed in the language that is unfamiliar to them. Let us look at the case of Japan. The Japanese are doing wonders in technology. We have many products locally that were manufactured in Japan, for example TVs, radios etc. In South Africa, we have no progress in the fields of science and technology because we have to initiate ideas in the language that we do not have a good grasp of.

The Japanese success is mainly due to their adhering to their beliefs in their own language, through which they could articulate their aspirations and identity but it is unfortunate that we cannot say the same about South Africa because of the lack of confidence in our languages. Many people believe that our languages cannot develop to be on a state of essential equality with English and learning science in African Languages will put learners at a disadvantage.

In addition to what the principal said about the use of language, one educator added that

> the learners start by learning the language first before they study the content but if they would learn the content subjects in the language they speak on a daily basis, they will have the terminology.

This statement is true because terminology develops as the situation compels it do so.

According to Mutasa (2002: 245), the development of a language lies in the heart of the speakers. If the speakers of a language have a positive attitude towards their language, its development will follow suit. From the data, it is obvious that many people still have negative attitude towards our African languages. They are still suffering from an inferiority complex. The interviewees believe that their language cannot develop as long as it still borrows from other languages.