CHAPTER ONE

INTRODUCTION

1.1 General Background

Translation has a long history and tradition. It has been influenced by the literary, historical and philosophical background of the period. Translation is a versatile means of communication in transferring knowledge, truth, cultures, ideas and such other. All the difference in human civilizations are shared, preserved, communicated and united only by means of translation. Any history survey of the activity of translation should start from the view of both Cicero and Horace on translation. Scholars claim that translation begins from the classical period. Jewish translation includes bilingual inscriptions from Assyria and Mesopotania (3000 B. C.). In ancient Rome, translation always done from Greek into Latin began in the second century AD with the shepherd of Hermas and parts of Bible. In the twelfth century, the west came into contact with Islam in Moorish Spain. The situation favoured the two essential conditions for large-scale translation: a qualitative difference in culture and continuous contact between two languages. When the Moorish supremacy collapsed in Spain, the Toledo School of translators translated Arabic version of Greek Scientific and Philosophical classics. Luther's Bible translation in 1522 laid the foundation of modern German, and King Jame's Bible (1611) had a seminal influence on the English language and literature. Significant periods of translation preceded Shakespeare and his contemporaries, French classicism and Romantic movements. Whereas sina the nineteenth century, translation was mainly one means of communication, the twentieth century employed translation extensively as a most powerful and indispensable vehicle for dissemination of knowledge and information. So, it has been called the 'age of translation' (Jumpelt, 1961 as cited in Rawal. 2007). Naturally, the translation in the twenty-first century is gaining a new ground, and a bulk of literary, scientific, technical and medical texts are being translated into multiple languages.

The systematic development and use of translation is quite old dating 3000 B.C. It was Andre Lefevere who for the first time proposed the designation. 'Translation Studies' in 1978 (Bennett Mc Guire 1980 as quoted in Bhattarai 2000) to replace terms 'translation theory' used in general, 'Translatology' in Canada, 'Translationlogia' in Spain, etc. As a young discipline, it has constantly undergone may changes until the present time.

The term translation is primarily a linguistic activity which comprises the transfer of the meaning of a text in one language and the production of a new, equivalent text in another language. The text of the language to be translated is called source language text (SLT) and the text of the language in which it is translated is target language text (TLT) but translation is not only a linguistic activity but also a cultural activity and something more. A good translator must not only be at least a bilingual but also bicultural. Translation scholars have defined translation in different ways:

Translation is the general term referring to the transfer of thoughts and ideas from one language (source) to another (target), whether the languages are in written or oral forms; whether the language have established orthography or do not have such standardization, or whether one or both language is based o signs, as with sigh languages of the deaf (Brislin, 1978:1).

Translation is a transformation of a text in a different language retaining, as far as possible, the content of the message and the formal features and functional roles of the original text (Bell, 1991). Translation is the process of replacing the textual materials of language by equivalent materials in another (Catford, 1965:20).

Translation is a craft consisting of the attempt to replace a written messager and/or statement in one language by the same message and/or statement in another language (Newmark 1981:7).

Translation is a procedure which leads from a written SLT to an optionally equivalent TLT and requires the syntactic, semantic, stylistic and text-pragmatic comprehension by the translator of the original text (Wilss, 1982:112).

The term translation is bilingual activity of rending a text from source language to target language attaining the semantic and pragmatic equivalence between two languages. The source language is called source text (ST) and target language is called target text (TT). It is an activity of importance in the present world and it is subject of interest not only to linguists, professionals and amateur translators and language teachers but also mathematicians, electronic engineers, lawyers, business persons etc.

Even thousands of translators and experts can not define the terms translation objectively, some define the term translation as a means of communication, some as an art, some as skill, some as linguistic activity. Some as cultural activity, some as process, some as product etc. Newmark(1988)says, translation is first a science and then a skill. Third an art and fourth a matter of taste. It has been taken as the process of translating as well as the result of this in a specific sense; translating refers to process or activity of rendering the message of one language into another, and translation as the product or result of this. But the term has been extended to refer to the rendering of the message from one dialect, register or style to another dialect, register or style.

Though the discipline 'Translation Studies' is new, it has developed beyond expectation. It has grown up as a fully fledged discipline with translation technique, translation process, translation product, translation evaluation "Translation has its own excitement, its own interest. A satisfactory translation is always possible, but a good translation is never satisfied with it. It can usually be improved. There is no such thing as a perfect ideal or correct translation. A translator is always trying to extend his knowledge and improve his means of expression he is always pursuing facts and words" (New mark: 1988: 8).

To sum up, translation is defined variously depending upon the genre, the nature of the activity, the medium employed, the purpose, audience and current theories of language philosophy, etc. It can be defined as the process of rendering a text from one language into another language in such a way that the texts maintain the semantic and pragmatic equivalences.

1.1.1 History of Translation in Nepal

A brief survey of translation in Nepal provides the evidence of heavy translation traffic flowing into Nepali, unidirectionally, particularly from Sanskrit and English. Sovary's observation is that, "Translation is almost as old as original authorship and has an honorable history and as complex as that of any branch of literature" (1957:37, in Bhattarai 1997). It applies in case of Nepali too. Here original writing and translation have evolved simultaneously in such a way that history of one cannot be separated from the other. When analyzed from the angle of translation tradition Nepali writing can be distinguished into the following three periods. Following Bhattarai (1997:9), the rough time division is:

i. The Beginning (1250 to 1866)
ii. The Formation Period (1867 to 1950)
iii. The Present (1951 onwards)

i. The Beginning (1250 to 1866)

Almost six hundred years of translation practice in Nepal looks very thin-all it amounts to is some royal inscriptions, eulogies, descriptions of battlefields, moral stories, records of donations and deeds and adaptations, mainly of religious works and classics from Sanskrit into the vernacular. One of the notable translations is the transcreation of Ramayana in Nepali from Sanskrit by Bhanubhakta Acharya (1814-1868), who is often called the Chaucer of the Nepali language. Translation in this age remained confined mainly to the Sanskrit-Nepali pair. It was a monodirectional, voluntarily practiced exercise and the labour of love (Bhattarai 1997:10). A few works on popular folk literature were also translated from Awadi, Bhojpuri, Urdu etc. the vernacular languages of North India.

ii. The Formation Period (1867 to 1950)

The formative period covers almost a whole centry, starting roughly from the age of Moti Ram Bhattta (1866 to 1896) and culminates in the revolution and the political change of 1951. The rise of Jung Bahadur Rana, who happhend to

be the founder of a new dynasty of autocratic rulers, the versatility of the young visionary poet Moti Ram Bhatta, Raja Jaya Prithivi Bahadur Singh's (1878-1940) universalistics vision, and the Nepalese youths' enlisting in the Brithish/Indian armies after the treaty of Sugauli were some of the important factors that helped exposing the Nepalese people to the outer world.

New spirit was reflected in the foundation of Gorkha Bhasas Praskasini Samit (Gorkha Language Publication Committee) in 1913. It changed into Nepali Bhasas Prakasini Samiti in 1930. Madan Mani Acharya Dixi'ts Yoropiya Sanhityako Namuna -1983 (Sample of European Literature) is one of the calssics produced by the committee to introduce the samples of European literature in translation to the Nepalese leadership. The book contains extracts of epic and lyrical poetry, drama and prose made from classical Greek, Shakespeare, the Romantics and the Victorians. It is during this period that the literature widened, more translations were produced, first from neighbouring literature and from Sankrit as well as Perso-Arabic classics and then from English (Bhattarai 1997:11). In 1934, a sub-committee came into existence under the Nepali Bhasa Prakasini Samiti so as to materialize the historic resolution. The sub-committee drafted a 24-book project with a vision of deemed tole university in mind, with immense world literature behind.

In 1937 another institution called Nepali Bhasa Anubad Parisad (Nepali Language Translation Committee) was established as complementary to the 24 year old Gorkha/Nepali Bhasa Prakasini Samiti.

iii. The Present (1951 onwards)

After the introduction of democracy in 1951, translation activities got a new height. Both the committees (Nepali Bhasa Prakasini Samiti and Nepali Bhasa Anubad Parisad) became defunct and merged into the Sajha Prakashan (Co-operative publication) in 1964. One of the milestones in the history of translation is the establishment of Nepal Academy in 1957. One of its objectives was to translate great works of world literature into Nepali. Apart from the attempts made in Nepal, some translation activities into the Nepali

language were made from Darjeeling. Under William Carey (1761-1834) the first Nepali bible (The New Testament) came as early as 1821. Another version was published by the British and Foreign Bible Society of India, Calcutta in 1902. Some prolific translators of Darjeeling are Okiuyama Gwynn, Bhaichand Pradhan ,Sukh Namphok, Prakash Kovid, Indra Sundas etc.

At present, Nepal's diplomatic relations with other nations have gained broader ground. Different offices and associations like Barat Maitri Sangh, French Cultural Centre, Tokyo Japanese Literature Translation Committee, Russioan Language and Literature Relation Association, etc. have all promoted the translation activity. A number of translators have been practicing the translation. Some of them are Abhi Subedi, Kshetra Pratap Adhikair, Govinda Raj Bhattarai, Bhuean Lal Pradhan etc. Among 1059 Nepali writers introduced in Bhattari (1994), 62 have contributed to more than 100 titles of translation, mostly from Sanskrit followed by other languages. Presently, Nepal Academy has launched different programmes to carry out translational activities into and from Nepali. For more than a century, different literary journals and periodicals from India and Nepal have been publishing translations from various sources. Translation is not confined to the transformation of literary and religious texts only, its scope has been broadened. A number of professionals are engaged in the task of translating a bulk of scientific, technical and other cultural text. Bhattarai (1997) oberves that interest in and attitude towards horizontal translation is gaining more ground. The most notable fact is that Tribhuvan University has introduced 'Translation Studies' as a separate subject in the Central Department of Linguistics and in the Department of English Education.

1.1.2 Morphology: An Introduction

Morphology is the science and study of the smallest grammatical unites of language, and of their formation into words including inflection, derivation and composition. Morphology is the study of the ways and methods of growing sounds into sound- complexes or words, of definite, distinct, conventional meaning. It is the study of the constructions in which sound forms appear

among the constituents. Broadly speaking, morphology is the study of the pattern of word forms.It studies how the words are formed, where they originated from, what their grammatical forms are, what the functions of prefixes and suffixes integrated the formation of words are, on what basis the parts of speech of a particular language are formed, how the system of gender, number plural etc. function and how and why the word form change.

Morphology is the grammar of words. The way morphemes combine to form words is known as the morphology of a language. It is not only the synchronic study of word- forms but is also the study of the history and development of words-forms. So it is both a synchronic and a diachronic study of the word-forms.

The morphological analysis is the observation and description of the grammatical elements in language by studying their forms and functions, their phonological variants, and their distribution and mutual relationships within larger stretches of speech.

1.1.3 Translation Strategies

The twentieth century employed translation extensively as a most powerful and indispensable vehicle for disseminating knowledge and information. Translation comprises the transfer of meaning of a text in one language and the production of a new equivalent text in another language. Translation is not only a linguistic activity but also a cultural activity and something more. Translation as a cross-cultural transmission of skills forms a bridge between two speech groups and is judged by the degree of gratifications/acceptance among the audience of the target group. While translating the text from one language into another, the translator has to face the problems due to the gaps that occur between the languages. Gaps occur if the concept available in one language is not available in another language. It may be in the ST or in the TT. So, to make the translation good, bridging gaps between two language or cultures is the main concentration of the translator. The translator needs some strategies while

translating the text and has to use them appropriately borrowing, definition, addition, substitution and omission etc. are the strategies used in translation.

However, if the knowledge is borrowed from one speech community to another speech community, the borrowing speech community has also to borrow the term which serves as base for coinage of equivalent in the borrowing language. The coinage of equivalents involves the process of translation either directly or indirectly. The lack of equivalents in the target language (TL) generally leads the translators to borrow the terms from one source language (SL) and adjust in the TL with or without any noticeable morphophonemic changes.

1.1.4 Translation of Technical Terms

This century is the age of science and technology and the knowledge of science and technology is exploding day by day. Every field has its own technical terminology to express its concept. Any new development in knowledge makes demand on the development of new terms to express this knowledge. Due to the advancement in the field of science and technology, the proliferation of terms due to advancement in science and technology is accruing at an exponential rate (Bennet, et al., 1986: 41) It is, therefore, necessary for the Nepali language either to translate these terms by coining new terms or to adopt the terms with little phonographic change or to adapt them in their current forms.

Language is related to different fields of knowledge. Natural sciences, social sciences, humanities, health, population, environment can be the main fields. Every field of knowledge has its own technical terminology. Technical terms are those items which are defined and used for specific purposes only. Terms are fixed in a particular cognitive field and used by a set of specialized users who share the common conceptual and pragmatic ranges. "Terms are finite in number in a technical lexicon or system and are fixed by their definitions" (Dodegaonkar et al., 1994: 143) Technical terms differ from non-technical terms structurally, semantically and functionally. They are claimed to be less ambiguous, more efficient from the point of view of precision in expression

knowledge and terminology to express it, grow together. Any person, who invents any idea, also invents a term for it in his language.

Technical translation is one part of specialized institutional translation; the areas of politics, business, law, government etc. is the other technical terms one those lexical items which are defined and used for specific purpose only. They are clamed to be less ambiguous, more efficient form the point of view of precision in expression (Dodegaonkar et al., 1994:143). The benefits of science and technology are not confined to one speech community, so technical translation is a must. The purpose of such translation is to provide people with clear cut information rather than double meanings. So, it is direct and comprehensible. It does not evolve emotions, feelings, humor satire etc. It is quite non-cultural, opposed to literary translation, universal and depersonalized. It is objective and content oriented and tends to be more science and less art.

The term translation, in the context of Nepal, invariably applies to the tradition and technique of information, transfer from English to Nepali and vice-versa" (Bhattarai, 1997:13). "Translation in general and technical translation in particular is an important tool for translation of scientific and technical knowledge across geographical and linguistic boundaries." Translation involves far more than replacement of lexical and grammatical items between languages." (Benett 1980, as cited in Bhattarai 2001)."In other words, a translator is not only creating or introducing technical items in the TL but he is also introducing a lot of concepts in his TL.

When a translator faced with an element of the source speech community which is absent in the target speech community, he relies on different techniques that enable him to convey to members of the target speech community the content of that particular element. When the target speech community "lacks a given element (object, concept, social institution, pattern of behavior, etc.) its language will normally lack on expression for it and it is translator's task to find out an expression in the target language

that will adequately convey the missing element to the speaker of target language" (Ivir, 1987: 18).

The translators' strategy in choosing a particular technique is governed by the nature of the term to be translated (its semantics content and the linguistic expressions in the source of language and its contrastive relationship to the possible correspondents in the target language). Since translation is bilingual as well as bicultural endeavor, the translator faces different problems both at the linguistic as well as extra linguistic levels. The fundamental problem involved in translation arises from the basic fact that natural languages differ in the matter of lexicalization of the concepts. That is to say, a language (L_1) may have a lexical item for a particular concept, while another language (L_2) may not have a lexical item in its vocabulary for that concept. This is known as lexical gap. "Lexical gaps are known to cause problems for translations" (Madhavan, 1994: 86).

1.1.5 The Translated Textbook of Hamro Bijyan for Grade VIII

Though the translation activity is ancient, the discipline is young and technical translation is even younger. Now, we all are in need of horizontal translation. From the few decades, attempts to translate English texts into Nepali and vice-versa are being made with great interest.

National Education Commission 2049 BS recommended and High Level Education Commission 2055 BS has made time relevant changes in the school level curriculums. Accordingly, Our Science for Grade VIII has been brought out in 2061 as a revised version in course of updating curriculum and textbook to meet the requirement of the 21st century. This book is the result of joint authorship by Dr. Ganesh Bahadur Mali, Sunita Malakar, Jivan Hari Shrestha and Uddabh Karki. The Curriculum Development Center (CDC) and Jank Education Materials Center (JEMC) produced and distributed the book. The English version of the textbook has been written by Bal Krishna Baidhya, Shankarman Shrestha, Rakesh Shrestha and Keshar Khulal.

The purpose of this study attempts to analyze the basic morphological features of the technical terms used in the English and Nepali science text books for grade VIII and the techniques adopted and the linguistic problems faced by the translators while translating the scientific terms from English into Nepali which is purely a pedagogic venture.

1.2 Review of the Related Literature

Significant number of texts has been translated from English into Nepali and vice-versa. It has had a long tradition since practiced in Nepal. But only a very few researches have been carried out regarding the techniques and problems of translating technical terms from English into Nepali or vice-versa.

Bhattarai (1997), made an attempt to define translation studies in general and to observe the process and product of translation traffic between Nepali-English language pair in particular. He has found that interest in and awareness towards bidirectional, horizontal translation in growing, the need for literary translation is expanding, language pair related studies are extremely important so that translation problems can be minimized and most imperfect translation result due to misreading or misinterpreting of the source text.

Adhikari (2003) carried out a research entitled 'A Study on the Translation of Technical Terms: A Case of Textbook for Science-X' to find Out the techniques and linguistic problems of translation of technical terms used in science textbook for grade IX. He collected 200 English scientific terms and their Nepali translation. He found that the use of literal translation, hybrid-formation, paraphrasing, borrowing loan shift and loan creation are the techniques used in the translation of technical terms. He founds that literal translation is widely used technique. He concludes that the problem lies in translation when a target language text lacks an equivalent terms that is present in the source language text.

Singh (2004) carried out a research to find out the techniques and gaps in translation of cultural terms. He collected 220 lexical terms from Nepali and

English version of Our Social Studies for grade VIII and classified them into five categories ecology, material culture/artifacts, mythic pattern, social culture and institutional and conceptual terms. He found a number of techniques of translation, literal translation being the most widely adopted procedure of translation of the technical and non- technical terms. He found that there exist a number of gaps in translation of cultural terms due to various reasons: lack of conceptual accuracy, lack of cultural equivalence, lack of lexical items etc.

Sharma (2004) carried out a research to evaluate the translation of text book. He has collected Nepali and English version of Social Studies textbooks for grade X. He listed out different types of sentences structures in the source text and their representational translation in the target text. He listed a number of negative, active and passive sentences and their corresponding translation in the target language.

Chhetry (2005) carried our research entitled "Translation of Technical Terms: A Case of Textbook for Health, Population and Environment Education for grade X."He collected 200 Nepali terms used in health, population and Environment and their translations in English. He analyzed the technical terms in morphological features, linguistic problems in translating, techniques etc. he found six techniques used to translate Health Population and Environment (HPE) terms. He concludes the there is possibility of literal translation, paraphrasing or other technique in translating technical terms, but majority of the terms are transliterated. He also found that both the Nepali and English languages are used as source of technical terms in the field of (HPE) .

The present study is related to lower secondary level. The particular book for the study is 'Hamro Bigyan' and its English version Our Science for Grade VIII. The technical terms that are taken for the study form Hamro Bigyan are different for the study from above mentioned study. If the words are different, their translation procedure will be different. Then the morphological structures and problems will be also different. So, my study will be different in such cases.

1.3 Objectives of the Study

The proposed study had the following objectives:

i. To analyze basic morphological features of technical terms used in English and Nepali science textbooks for Grade VIII.
ii. To find out techniques involved in the translation of technical terms from English into Nepali.
iii. To find out the linguistic problems of translation of technical terms used in the science textbook for grade VIII.
iv. To recommend some pedagogical implications.

1.4 Significance of the Study

The study is significant as it sheds light on the technical aspect of translation of scientific terms, which in turn provides insight in term planning, translating science textbooks from English to Nepali as well as writing Nepali science textbooks. Though there are sufficient Nepali terms for English terms, the translators have not paid attention while translating English technical terms in to Nepali. Instead of searching particular terms of Nepali they translated English term into Nepali with little phonographic change. Similarly, the language planners, textbook writers and the teachers and students of science, translators and linguistics will be benefited from this study.

CHAPTER TWO

METHODOLOGY

To achieve the objectives of the study the following methodology was adopted:

2.1 Sources of Data

The researcher made use of only secondary sources of data. He consulted the Nepal and English visions of science textbook for grade VIII designed and published by CDC and JEMC-Nepal Government Department of Education and Sports, books, theses, journals, dictionaries articles related to the proposed study in order to facilitate the research work.

2.2 Sampling Procedure

First of all two hundred forty- six English scientific terms and their Nepali translations were purposely selected from physics, chemistry, biology and geology and astronomy parts of grade eight textbook of both English and Nepali versions produced and published by CDC and JEMC.

2.3 Process of Data Collection

The researcher followed the following steps for data collection:

i. Collection of two hundred forty six English scientific terms (From Physics, Chemistry, Biology, Geology and Astronomy) and their Nepali translation from English and Nepali textbooks of grade VIII. produced and published by CDC and JEMC (see Appendix I)
ii. Transliteration of collected SL and TL terms into Roman script on the basis of Turners' Devanagari alphabet.
iii. Classification of the collected terms on the basis of their morphological structures.
iv. Classification of the terms under the following five broad headings:

The following table shows the terms of Physics, Chemistry, Biology, Geology and Astronomy and scientific symbols, abbreviations and acronyms .

Table No.1

S.N.	Headings	SL (English)	TL (Nepali)
1.	Terms of Physics	mass gravity velocity liquid pressure electrical energy echo ray convex mirror denser medium	piṇda gurutwa gati tarala padārth ko cāp bidhdhut śakti pratidhwani kiraṇ kanbheksainā saghan mādhayāma
2.	Terms of Chemistry	nucleus potassium molecule inert gas condensation hydrochloric acid litmus centrifuging atomic salt	nuyukliyes potāsiem aṇū niskriya gyās saṅghanan hāiḍroklorik amla litmas śentriphyujiṅ paramasṇwik lawaṇ
3.	Terms of Biology	manual medicinal plant pollination male gamete bisexual fertilization invertebrate parasite tissue photosynthesis	standhari jadibuti parāgsecan bhāle liṅga kos ddijingiya garbhādhān kṛiya ḍhāḍnabhayekā janābar parajibi tantū parkāś saślesṇ kṛiyā
4.	Terms of Astronomy and Geology	rock sandstone space green house lava solar system satellite virgo troposphere sedimentary rock	cattān syānḍston antarichaya baritagṛiha lābhā sauryamaṇḍal ūpagraha kanyā nimnamaṇḍal patre cattān
5.	Terms of scientific Symbols, abbreviations and acronyms	Kg S K M J He Na RBC	kigra se ke mi J He Na RBC

2.4 Limitations of the Study

The study had the following limitations:

i. The area of study, as the title suggests, was limited to only the translation of technical terms of the selected science textbooks for grade VIII.

ii. The study was limited to the analysis of morphological structure, the techniques and linguistic problems of translation of the technical terms.

iii. So far the morphological analysis of the scientific terms was concerned, the morphological structure of scientific symbols and abbreviations and acronyms are not discussed in the study.

iv. English scientific terms which were adapted in Nepali without any noticeable change were not discussed under the type of Nepali scientific terms.

CHAPTER THREE

ANALYSIS AND INTERPRETATION

In this chapter, the data collected from Nepali and English version of our science textbooks of grade VIII published by CDC and JEMC have been analyzed and interpreted to classify and describe English and Nepali scientific terms on the basis of morphological structures. They have further been analyzed and interpreted to find out techniques and linguistic problems in translation of scientific terms from English to Nepali. The analysis and interpretation of the data has been presented under the following main headings:

3.1 Types of English Scientific Term

Most of the English scientific terms were originated from Greek and Latin. Some of the terms were originated from Arabic, Middle Latin, old English and personal name, too. In this section, one the basis of morphological analysis of terms the researcher found the following two types of English scientific terms on the basis of morphological analysis:

3.1.1 Monomorphemic Terms

Among the collected data of English scientific terms, the following terms are one constituent term or free morphemes which have only one root or stem i.e. monomorphic terms (See Appendix II)

Lead	Mass
Foot	Lava
Volt	Salt
Heart	Ray
Planet	Volcano
Liver	Pascal
Second	Argon
Joule	Matter

Out of two hundred forty- six terms, sixty - six terms were monomorphemic.

3.1.1.1 On the Basis of the Terms for Different Categories

On the basis of the terms for different categories, the following types of monomorphemic terms are found to occur in the English science textbook.

a. Terms for element and compound e.g. boron, marble, salt, lead, gem, neon, argon, crystal, mercury, alcohol.
b. Terms for units e.g. gram, meter, mile, yard, foot, inch, second, sound, minute, hour, watt.
c. Terms with personal name (eponyms) e.g. Newton, Pascal, Ampere, Volt, Joule.
d. Terms for anatomy e.g. stomach, liver, tissue, heart, artery, vein, venue, testis.
e. Conceptual terms e.g. mass, speed, force, sound, echo, atom, ray, mammal, matter, compound, calyx, light, beam, power, litmus.
f. Terms for astrology and geology e.g. rock, lava, volcano, space, star, comet, orion, virgo, virgil, gemini, libra, satellite, coal, fossil, planet, gneiss, orbit.

3.1.2 Polymorphemic Terms

Terms consisting of two or more constituents are found in some of the English scientific terms. The terms are formed by means of one of the two major word formation processes in English, affixation and compounding.

3.1.2.1 Terms Formed by Affixation

Affixation is a process whereby a prefix, suffix or both are added to a root. In other words, affixation is the morphological process whereby grammatical or lexical information is added to a root is known as affixation. A root with one or more than one affix is found in some of the English scientific polymorphemic terms. Terms formed by affixation are of the two types:

a) Terms Formed by Single Affixation

A root with only one deviational affix is found in some of the English scientific polymorphism terms. The sign (-) to the right of the root indicates that the root is bound.

i) Prefix + root

E.g. Telescope

Exosphere

Diameter

Out of thirty three terms which were formed by single affixation only three were formed by prefixation.

ii) Root + suffix

The following table shows the terms that have ' root + suffix' structure.

Table No. 2

Magnetism	Pressure
Magnesium	Friction
Corolla	Mixture
Digestion	Sexual
Metabolism	Mixture
Pulmonary	Ovary
Xylem	Flammable
Weight	Nutrition
Magma	Capillary
Gravity	Graphite
Density	Granite
Environment	Organic
Excretion	
Meteorite	

The above table shows that out of thirty three terms which were formed by single affixation, twenty six were formed by suffixation where the root is free.

iii) Root - + suffix

The list shows the terms that have 'root - + suffix' structure.

For example:

Silica	Stigma
Asteroid	Ventricle

Out of thirty three terms which were formed by single affixation, four were formed by suffixation where the root is bound.

b) Terms Formed by Multiple Affixations

A root with more than one derivational affix is found in some of the Polymorphemic terms. The structures of the Polymorphemic terms through the process of multiple affixations are as follows:

i) Prefix + root + suffix

The following table shows the terms that have ' prefix + root+ suffix' structure.

Table No. 3

Asexual	Monocotyledonous
Centrifuging	Unisexual
Conglomerate	Regeneration
Bisexual	Micro-Organism
Dicotyledonous	Reaction
Disintegration	

The above table shows that, out of twenty six terms formed by multiple affixations, eleven were formed by adding a prefix, a suffix to a root.

ii) Prefix + root + suffix + suffix

The following table shows the terms that have ' prefix + root + suffix + suffix' structure.

Table No. 4

Acceleration	Propagation
Condensation	Constellation
Invertebrate	Reverberation
Unicellular	

The above table shows that, out of twenty six terms formed by multiple affixations, seven were formed by adding a prefix, and two suffixes to a root.

iii) Root + suffix + suffix

The following table shows the terms that have ' root + suffix+ suffix' structure.

Table No. 5

Crystallization	Convection
Fertilization	Molecular
Germination	Temperature
Pollination	Sporulation

The above table shows that, out of twenty six terms formed by multiple affixations, eight were formed by adding two suffixes to a root.

3.1.2.2 Terms Formed by Compounding

Compounding is a technique of word formation where there the combination of at least two roots or bases to form a new word.

A) On the Basis of Head Word

On the basis of head word, some compound terms are found to occur in English science textbook.

a) Compound Nouns

The general structure of the compound noun is as follows;

$$\mathbf{N} \rightarrow \left\{ \begin{matrix} \mathbf{N} \\ \mathbf{V} \\ \mathbf{A} \\ \mathbf{Prep} \end{matrix} \right\} \mathbf{N}$$

(Adapted from Katamba 1993:323)

Some compound terms are found to contain a noun followed by another noun, verb followed by a noun, an adjective followed by a noun and a preposition followed by a noun. Among them only the following terms are found to occur in the English science textbook:

i) N → NN

The following table shows the terms of compound noun containing two nouns.

Table No. 6

Air pressure	Carbon dioxide
Sound energy	Male gamete
Light energy	Pole star
Heat energy	Mud ball
Horse power	Light year
Incident ray	Lime stone
Zinc plate	Wildlife conservation

The above table shows that, out of forty nine terms of compound nouns, fourteen terms contain a noun followed by another noun.

ii) N → AN

The following table shows the terms of compound nouns containing an adjective followed by a noun.

Table No. 7

Liquid pressure	Atomic weight
Saturated Solution	Citric acid
Uniform Velocity	Inert gas
Average Velocity	Ornamental plant
Relative motion	Medicinal plant
Electrical energy	Digestive canal
Magnetic Energy	Vegetative propagation
Nuclear energy	Sedimentary rock
Copper plate	Volcanic rock
Coppers Sulphate	Solar system
Mechanical energy	Sand stone
Kinetic energy	Great bear
Chemical energy	Green house
Solar energy	convex mirror
Potential energy	Rarer medium
Denser medium	

The above table shows that, out of forty nine terms of compound nouns thirty one contain an adjective followed by a noun.

iii) N → VN

The following list shows the terms of compound noun containing a verb followed by a noun.

Reflected ray
Diverging mirror
Measuring cylinder
Converging mirror

The above list shows that, out of forty nine terms of compound noun four contain a verb followed by noun.

b) Compound Adjectives

The general structure of the compound adjective is as follows:

$$A \rightarrow \left\{ \begin{array}{c} \mathbf{N} \\ A \\ \Pr ep \\ Adv \end{array} \right\} A$$

(Adapted from Katamba: 1993: 305)

Some of the compound terms are found to contain an adjective followed by an adjective, a noun followed by an adjective, a preposition followed by an adjective and an adverb followed by adjective. Among them only one type of structure is found to secure in the English science textbook:

i) A → AA

The following list shows the compound adjectives containing an adjective followed by an adjective.

e.g. Negative terminal
Positive terminal

B) Neo-classical Compounds

Some words do not occur under the above mentioned structure." Some compound terms are found to appear to straddle the borderline between compounding and affixation. In most of these words part of the word is form borrowed Greek and Latin"(Katamba 1993:323). The sign (-) left or right to the root indicates that the root is bound. On the basis of structure the following two types of neo- classical compounds are found to occur:

a) root - + - root

The following list shows neo-classical compounds containing two bound roots.

Hydrogen
Oxygen
Chlorophyll
Cryptogams
Protoplasm
Atmosphere
Mesosphere
Autotrophic
Chromatography

The list shows that, out of the fifteen neo-classical compounds, nine terms were formed by combining two bound roots.

b) root- + root

The following list shows neo-classical compounds containing a bound root followed by free root.

Centimeter
Troposphere
Carbohydrate
Electromagnet
Troposphere
Thermosphere

The list shows that, out of the fifteen neo-classical compounds six terms were formed by combining bound root and a free root.

3.2 Types of Nepali Scientific Terms

Most of the Nepali terms are originated from Sanskrit. Some of the terms are originated from Hindi and Arabic too. As the knowledge in the field of science and technology is taken from English speech community, different terms are also borrowed from English and adopted them into Nepali text. So, in this section the morphological structure of English monomorphemic and polymorphemic terms which are adapted in Nepali without any noticeable morphological change are not discussed.

The researcher found the following two types of scientific terms to occur in the Nepali science text book while going through the morphological analysis.

3.2.1 Monomorphemic Terms

The terms with single or only one morpheme are called monomorphemic terms. The following monomorphemic terms are found in the Nepali science text book:

The following table shows the Nepali monomorphemic terms.

Table No.8

Nepali Term	English Equivalent
cāp	pressure
kiraṇ	ray
tāp	heat
bal	force
beg	speed
cāl	motion
aṇu	atom
lawaṇ	salt
maṇibha	crystal
amla	acid
kṣār	base
bhrun	embryo
tantu	tissue
cattān	rock
bijuli	electricity
ratna	gem
graha	planet
ūlkā	meteor
mithun	gemini
tulā	lybra
Śirā	veins
koilā	coal
Pinda	mass
kanyā	virgo
mutu	heart

The above table shows that, twenty five terms were monomorphemic out of the collected data of Nepali scientific terms.

3.2.2 Polymorphemic Terms

More than one morpheme is found to occur in some of the scientific terms. Two types of polymorphemic terms are found to occur in the Nepali science textbook, on the basis their structure, they are as follows:

3.2.2.1 Words Formed by Affixation

A root with one or more than one affixes are found in some of the Nepali scientific polymorphemic terms (see App…) the root is either bound or free. Such terms are of two types and on the basis of their structure they are as follows:

a) Words Formed by Single Affixation

A root with only one derivational affix is found in some of the polymorphemic terms. The structures of polymorphemic terms formed thorough single affixation are as follows:

i) Prefix + root

The following table shows Nepali polymorphemic terms formed by single affixation that have ' prefix + root' structure.

Table No. 9

Nepali term	English equivalent
pratidhoni	echo
pratikṛiya	reaction
prakaś	light
paramāṇu	atom
yaugik	compound
miṣraṇ	mixture
dalahan	legumes
parajiwi	parasite
sȧmbahan	convection
sȧmyojan	fusion

The above table shows that, out of thirty seven terms formed by single affixation, ten terms were formed by adding a prefix to a root.

ii) Root + suffix

The following table shows Nepali polymorphemic terms formed by single affixation that have ' root + suffix' structure.

Table No. 10

Nepali terms	English equivalent
gurutwa	gravity
ghanatwa	density
gati	velocity
gharṣaṇ	friction
kṣyamata	capacity
tāpkram	temperature
āṇwik	atomic
dhoni	sound
haritkaṇ	chlorophyll
jwalanśila	flammable
sāmarthya	power
antarikṣya	space
tārā	star
śakti	energy
kārya	work
padārtha	matter
tatwa	element
istandāri	mammal
parāgascan	pollination
milan	fusion
aṅkuraṇ	germination
dhamani	artery
kośikā	capillary
maithunik	sexual
dalhan	legumes
puṣpadala	petal
patradala	spell

The above table shows that, out of thirty seven terms formed by single affixation, twenty seven were formed by adding a suffix to a root.

b) Words Formed by Multiple Affixation

A root with more than one derivational affix is found in some of the polymorphemic terms. The structure of the polymorphemic terms formed through multiple affixations is as follows:

i) Prefix + root + suffix

The following table shows Nepali polymorphemic terms formed multiple affixations that have ' prefix + root + suffix' structure.

Table No. 11

Nepali term	English equivalent
uttolak	lever
āyatan	volume
paramāṣwik	atomic
ddiliṅgiya	bisexual
ekliṅgiya	unisexual
apuṣpak	cryptogam
sapuṣpak	pharengoam
ekdaliya	monocotyledonous
duidaliya	dicotyledonous
niskāṣan	excretion
amaiathunik	asexual

The above table shows that, eleven terms were formed by multiple affixations i.e. by adding a prefix and a suffix to a root.

3.2.2.2 Words Formed by Compounding

Compounding is a technique of word formation where there is the combination of two words (i.e. two free morphemes) to form a new word. Sometimes, compounds are not necessarily combination of free morphemes. Compound terms are categorized on the following two bases:

A) On the Basis of Source

On the basis of the source two types of compound terms are found to occur in Nepali science terminology. They are as follows:

i) Homogeneous Compound

The compounds are found to contain the words from the same source (i.e. Nepali).

The following table shows Nepali homogeneous compound terms and their English equivalent terms.

Table No. 12

Nepali terms	English equivalent
samān gati	uniform velocity
asamān gati	variable velocity
bidhdhut śakti	electrical energy
hāwāko cāp	air pressure
ausat gati	average velocity
sāpekṣik gati	relative motion
wāyumaṇdaliya cāp	atmospheric pressure
dhoni śakti	sound energy
cumbakiiya śakti	magnetic energy
āṇawik śakti	nuclear energy
āpatit kiraṇ	incident ray
parābartit kiraṇ	reflected ray
tāp śakti	heat energy
saghan mādhyāma	denser medium
parkās śakti	light energy
isthiti śakti	potential energy
yāntrik śakti	mechanical energy
gati śakti	kinetic energy
rasāyanik śakti	chemical energy
asw śakti	horse power
saurya śakti	solar energy
birala mādhyāma	rarer medium
ābaratit kiraṇ	refracted ray
tāmāko pātā	copper plate
jastāko pātā	zinc plate
riṇ dhruba	negative terminal
dhan dhruba	positive terminal
nilotutho	copper sulphate
pramāṇwik bhār	atomic eight
santriptaghoi	saturated solution
khādhya biruwā	food plant

Nepali terms	English equivalent
baya jantu śarksaṇ	wildlife conservation
poathi linga koṣ	female gamete
bhāle linga koṣ	male gamete
swa parāgsecan	self – pollination
para parāgsecan	cross – pollination
garbhadhān kṛiyā	fertilization
suksma jib	micro – organism
pācan nati	digestive canal
kaḍā ābaraṇ	hard – exoskeleton
bhāle prajanan koṣ	sperm
pothi prajanan koṣ	ovum
parkās sasleṣṇ kiṛya	photosynthesis
bhitri jwalan	internal combustion
patre cattān	sedimentary rock
paribartit caltān	metamorphic rock
jwālāmukhi śiśā	volcanic glass
harit gṛiha	green house
saurya maṇal	solar system
tārāmandal	constellation
pārkaś warṣa	light year
ulkā piṇda	meteorite

The above table shows that, out of sixty- five terms, fifty four were homogeneous on the basis of source.

ii) Heterogeneous Compounds

Some of the compound terms are found to contain the words from the English and Nepali languages.

The following table shows Nepali heterogeneous compound terms and their English equivalent terms.

Table No. 13

Nepali term	English equivalent
kankebh ainā	convex mirror
kankebh ainā	concave mirror
imarjent kiraṇ	emergent ray
phikā salphyurik amla	dilute sulphric acid
suṣka śel	dry cell

hāiḍroklorik amla	hydrochloric acid
salphyurik amla	sulphric acid
nāitrik amla	nitric acid
asetik amla	acetic acid
niśkṛiya gyas	inert gas
āgneya cattān	igneous rock

The above table shows that, out of sixty- five terms eleven were heterogeneous i.e. combination of both English and Nepali words.

B) On the Basis of Headword

On the basis of head word, two types of compound terms are found to occur in Nepali science terminology. They are as follows:

a) Compound Nouns

The general structure of compound noun is as follows;

$$\mathbf{N} \rightarrow \left\{ \begin{matrix} \mathbf{N} \\ \mathbf{V} \\ \mathbf{A} \\ \mathbf{prep} \end{matrix} \right\} \mathbf{N}$$

(Adapted from Katamba 1993:323)

Some Nepali compound nouns were found to contain a noun followed by another noun, a verb followed by a noun, an adjective followed by noun and a preposition followed by a noun. Of them, only the following ones are found to occur in Nepali scientific compound terms:

i) N → NN

The following table shows Nepali compound nouns containing a noun followed by another noun and their English equivalent terms.

Table No.14

Nepali Term	English equivalent
Ausat gati	Average velocity
Hāwāko cāp	Air pressure
Isthiti Śakti	Potential energy
Tāp Śakti	Heat energy
Gati Śakti	Kinetic energy

AŚwa Śakti	Horse power
Kiraṇ puṅj	Beam
Tāmāko pātā	Copper plate
Jastāko pātā	Zinc plate
Garbhādhān kṛiya	Fertilization
Pāean nail	Digestive canal
Parkās saŚleṣṇ kṛiyā	Photosyathesis
Jwālāmukhi ŚiŚā	Vocanic glass
Harita gṛiha	Green house
Tārāmaṇḍal	Constellation
Parkās warṣa	Light year
ūlkā piṇḍa	Meteorite

The above table shows that out of thirty- eight compound nouns, seventeen terms contained a noun followed by another noun.

ii) N → AN

The following table shows Nepali compound nouns containing adjectives followed by a noun and their English equivalent terms.

Table No. 15

Nepali term	English equivalent
samān gati	uniform velocity
asamān gati	variable velocity
bidhdhut śakti	electrical energy
sāpekṣik gati	relative motion
wāyumaṇdaliya cāp	atmospheric pressure
dhoni śakti	sound energy
āṇawik śakti	nuclear energy
saghan mādhyāma	denser medium
yāntrik śakti	mechanical energy
rasāyanik śakti	chemical energy

Nepali term	English equivalent
saurya śakti	solar energy
birala mādhyāma	rarer medium
nilotutho	copper sulphate
santriptaghol	saturated solution
khādhya biruwā	food plant
suksma jib	micro – organism
kaḍā ābaraṇ	hard – exoskeleton
bhitri jwalan	internal combustion
patre cattān	sedimentary rock
paribartit caltān	metamorphic rock
saurya maṇal	solar system

The above table shows that out of thirty- eight compound nouns, twenty- one were formed by containing an adjective followed by noun.

b) Compound Adjectives

Some of the compound terms are found to contain a noun followed by an adjective.

The general structure of the compound adjective is as follows:

$$A \rightarrow \left\{ \begin{array}{c} \mathbf{N} \\ A \\ \mathrm{Pr}\,ep \end{array} \right\} A$$

(Katamba 1993: 306)

Some of the compound terms are found to contain a noun followed by an adjective, an adjective followed by an adjectives and a prepostion followed by an adjective. Out of the above mentioned structure only the following ones is found to occur in Nepali science textbooks.

i) A → NA

The following list shows Nepali compound adjective formed by containing a noun followed by an adjective and their equivalent terms in English.

negative terminal	riṇ dhruba
positive terminal	dhana dhruba

The list shows that, out of forty six terms only two terms formed by containing a noun followed by an adjective.

Compounding in Nepali is recursive in principle some Nepali scientific terms are formed like this:

Example:

ANN

pothi liṅga koṣ

phale liṅga koṣ

banya jantu sarksyan

bhāle prajanan koṣ

pothi prajanan koṣ

Out of forty six terms, five are recursive in Nepali. They formed by containing an adjective followed by two nouns.

3.3 Techniques of Translation of Scientific Terms from English to Nepali

On the basis of analysis of English scientific terms and their Nepali translation, the researcher found the following six types of techniques of translation:

i) Literal translation
ii) Borrowing
iii) Hybrid formation
iv) Loan shift
v) Loan creation
vi) Paraphrasing

3.3.1 Techniques of Translation of Term in Physics

Of six types of techniques (c.f. 3.3) the following ones are used to translate terms of physics from English into Nepali.

a. Literal translation

As a procedure of technique, literal translation is often loosely equated with a word – for – word translation. The target language translates the source language terms item by item by reflecting its primary sense. Newmark (1988: 69) says that Literal translation is correct and must not be avoided, if it secures referential and pragmatic equivalence to the original. He further says that "I believe literal translation to be the basic translation procedure, both in communicative and semantic translation, in that translation starts from there however, above the word level, literal translation becomes increasingly difficult."

The following table shows the term of physics translated literally.

Table No.16

SL term (English)	TLterm (Nepali)
density	ghanatwa
average velocity	ausat gati
heat energy	tāp śakti
ray	kiraṇ
negative terminal	riṇ dhruba
motion	cāl
speed	beg
relative velocity	sāpeksik gati
force	bal
pressure	cāp
eight	taul
atmospheric pressure	wāyumaṇdliya cāp
power	sāmarthya
friction	ghrṣaṇ
heat energy	tāp śakti
temperature	tāp kram
reflected ray	pārābavtit kiraṇ
incident ray	āpatite kiraṇ
denser medium	saghan mādhyām
rarer medium	biralal mādhyām
reflected ray	

SL term (English)	TLterm (Nepali)
sound energy	ābartit kiraṇ
positive terminal	dhwni śakti
electrical energy	dhana dhruba
magnetic energy	biddhut śakti
nuclear energy	cūmbakiya śakti
light energy	āṇawik śakti
potential energy	parkaś śakti
mechanical energy	isthiti śakti
kinetic energy	yāntrik śakti
chemical energy	gati śakti
horse power	rasāyanik śakti
atom	aśwa śakti
	paramāṇu

The above table shows that thirty three terms of physics were translated literally.

b. Loan Creation

This is the lexical innovation based on the Sl model. New terms in TL are coined by using available concepts to match the SL term. In coinages, suitable prefixes, suffixes are fixed to make derivative words from the basic words available in the TL; besides this new compound terms can be coined from current basic words to match the SL terms.

The following table shows the terms of physics translated through loan creation.

Table No. 17

SL term (English)	TL term (Nepali)
Acceleration	Prabeg
Variable velocity	Asamān gati
Echo	Pratidhwani
Magnetism	Cumbakatwa
Flammable	Jwalansil
Reaction	Pratikṛiyā
Chlorophyll	Haritkaṇ
Beam	Kiraṇ punj
reverberation	Gunjayamān

The above table shows that nine terms were translated through loan creation.

c. Hybrid Formation

Hybrid form is a normal and natural linguistic phenomenon in technical terminology of any developing language translates the source language terms, borrowing one constituent from the source language and translating the other constituent of the source language construction.

The following table shows the terms of physic translated through hybrid formation.

The following table shows the terms of physics translated through hybrid formation.

Table No. 18

SL term (English)	Hybrid term in TL (Nepali)
Concave mirror	Kankebh ainā
Convex mirror	Kanbhekh ainā
Dry cell	Suṣka Śel

The above table shows that three terms of physics were translated through hybrid formation.

d. Loan Shift

The target language translates the source language terms by extending or contracting the semantic range of the existing word in the target language to convey the technical concept. This technique is used to adopt the meaning of indigenous words of which meanings were not originally within the semantic range of such words to match the SL expression.

The following example shows the terms of physics translated through loan shift.

SL term (English)	TL term (Nepali)
Mass	Piṇda
Electricity	Bijuli (Bidhdhut)

Only two terms of physics were translated through loan shift.

e. Borrowing

Transliteration is a process of conversion of a SL word into the TL script maintaining the SL pronunciation with some type of adjustment. “This adjustment may be based on the sound involved or it may be a type of transcription of letters of the words borrowed (Nida 1964).

The following shows the terms of physics that were borrowed from English and transliterated into Nepali.

The following shows the terms of physics that were borrowed from English and transliterated into Nepali.

Table No. 19

SL term (English)	Borrowed term in TL (Nepali)
Effort	Iphort (Iphort)
Thermometer	Tharmāmitar
Centimeter	Sentimitar
Kilometer	Kilomitar
Measuring cylinder	Mejariṇ Siliṇdar
Pascal	Pāskal
ampere	Empiyar
Volt	Bholt
Gram	Grām
Joule	Jula
Mile	Māil
Yar	Yārd
Foot	Phut
Inch	Iṇc
Second	Sekeṇd

The above table shows that fifteen terms of physics were borrowed and transliterated into Nepali.

f. Paraphrasing

Paraphrasing is giving descriptive and / or functional equivalence of the SL terms. In paraphrasing, TL explains the meaning of the SL terms using different words in order to make it easier to understand. According to Willss (1982) if a certain lexeme for a certain concept is absent from the TL

inventory, the only compensatory way open to the translator is lexical by pass strategy such as paraphrasing or explanatory translation. Paraphrasing is an extended synonym or inevitable an expression and a diffusion of SL terms.

The following table shows the terms of physics that were paraphrased into Nepali.

Table No. 20

SL term (English)	Paraphrasing in TL (Nepali)
candela	parkāś ko camkilopanā
mole	padārth ko mātrā
liquid pressure	taral padārthako cāp
wind mill	hawābāta calne mila
propagation medium	dhwani prasāran hune mādhyām
air pressure	hāwāko cāp

The above table shows that six terms of physics were paraphrased into Nepali.

Techniques of Translation of Terms in Physics

Total Number of Terms for Physics: 68

Table No. 21

S.N.	Techniques	No of terms	Percentage
1	Literal translation	33	48.52
2	Loan creation	9	13.04
3	Hybrid formation	3	4.34
4	Loan shift	2	2.89
5	Borrowing	15	21.73
6	Paraphrasing	6	8.69

The above table shows the techniques used in translation of terms for physics. The table shows that six techniques are used to translate the terms of physics, 33 (48.52%) terms out of 68 terms are translated literally. 9 (13.04%) terms are translated through loan creation and 2 (2.89%) are translated through loan shift. 15 (21.73%) terms are borrowed from English and transliterated into Nepali and finally 6 (8.69%) terms are paraphrased in Nepali.

The above table shows that literal translation is the most and loan shift is the least frequently used technique in the translation of terms for physics.

3.3.2 Techniques of Translation of Terms for Chemistry

Of six types of techniques (CF 3.3) only the following techniques are adopted to translate the terms of chemistry from English to Nepali.

a. Literal Translation

The process of translation is the same as mentioned in 3.3.1

The following table shows the terms of chemistry that were translated literally.

Table No. 22

SL Term (English)	TL Terms (Nepali)
matter	padārtha
compound	yaugik
element	tatwa
copper sulphate	nilotutho
salt	lawaṇ
mixture	miśraṇ
crystal	maṇibh
saturated solution	santriptaghol
acid	amla
base	kṣār
condensation	sanghanan
molecule	aṇu
atomic weight	parmāṇwik bhār
mercury	pāro
lead	śiśā

The above table shows the fifteen terms of chemistry are translated literally.

b. Loan Creation

The process of translation is the same as mentioned in 3.3.1.2.

The following table shows the terms of chemistry that were translated through loan creation.

Table No. 23

SL term (English)	Coined term in TL (Nepali)
atomic	paramāṇwik
molecular	āṇawik
crystallization	maṇibhikaraṇ
atom	paramāṇu

The above table shows that four terms of chemistry were translated through loan creation.

c. Hybrid Formation

The process of translation is the same as mentioned in 3.3.1.3.

The following table shows the terms of chemistry that were translated through hybrid formation.

Table No. 24

SL Term (English)	Hybrid terms in TL (Nepali)
hydrochloric acid	hāidroklorik amla
suphric acid	salphyrūrik amla
nitric acid	nāitrik amla
acetic acid	asetiik amla
inert gas	niskriya gyās
dilute sulaphric acid	phikā salphyurik amla

The above table shows that six terms were translated through hybrid formation.

d. Borrowing

The process of translation is the same as mentioned in 3.3.1.5

The following table shows the terms of chemistry that were borrowed from English and transliterated into Nepali.

Table No. 25

SL Term (English)	Borrowed Term in TL (Nepali)
Carbon dioxide	kārbadāiaksāid
Proton	proton
Neutron	nyūtron
electron	ilektron
hydogen	hāidrojan
Oxygen	aksijan
magnesium	myāgnesiyam
nucleus	niyukliyes
centrifuging	śentriphujin
chromatography	kromātogrāphi
lituns	litmas
alcohol	alkohal

The above table shows the twelve terms of chemistry were borrowed from English and transliterated into Nepali.

e. Paraphrasing

The process of translation is the same as motioned in 3.3.1.6

The following table shows the terms of chemistry that were paraphrased into Nepali.

Table No. 26

SL term (English)	Paraphrasing in TL (Nepali)
lactic acid	amio dudh
citric acid	kāgatiko ras
rusting	khiya lāgnu
copper plate	tāmāko pātā
zinc plate	jastako pata

Techniques of Translation of Terms in Chemistry

Total Number of Terms in Chemistry 42

Table No. 27

S. N.	Techniques	No of terms	Percentage
1	Literal translation	15	35.71
2	Loan creation	4	9.52
3	Hybrid formation	6	14.28
4	Paraphrasing	5	11.90
5	Borrowing	12	28.57

The above table shows the technique used in translation of terms in chemistry. The table shows that five techniques are used to translate terms of chemistry. 15 (35.71) out of 42 terms are translated literally .4(9.52%) are translated through loan creation,6(14.28%) are translated through hybrid formation, 12 (28.57%) are borrowed from English and transliterated into Nepali and finally 5 (11.90%) are paraphrased in Nepali.

The above table shows that literal translation is the most and loan creation and paraphrasing are the least frequently used techniques in translation of terms of chemistry.

3.3.3 Techniques of Translation of Terms of Biology

Of six types of techniques (c.f. 3.3) only the following techniques are adopted to translated the terms of biology from English to Nepali:

a. Literal Translation

The process of translation is the same as mentioned in 3.3.1
The following table shows the terms of biology that were translated literally.

Table No. 28

SL term (English)	TL term (Nepali)
mammal	iśtandhāri
environment	wātāwaraṇ
medicinal plant	jadibuti
food plant	khādhya biruwā
wildlife conservation	banyajantu samrkṣyaṇ
petal	pûṣpadal
sepal	patradal
fertilization	garbhādhvn kṛiyā
fusion	milan/ samyojan
embryo	bhrūṇ
digestive canal	pãcannali
hard – exoskeleton	kaḍã ãbaraṇ
cell	koṣ
sell wall	koṣ bhittā
plant cell	banaspati kos
nutrition	poṣaṇ
digestion	pācān
tissue	tantū
heart	mūtū
veins	śirā
artery	dhamani
capillary	kosikā
germination	ankuraṇ
internal combustion	bhitrin jwalan

The above table shows that twenty four terms of biology were translated literally.

b. Loan Creation

The process of translation is the same as mentioned in 3.3.1.2.

The following table shows the terms of biology that were translated through loan creation.

Table No. 29

SL term (English)	Coined term in TL (Nepali)
metabolism	upāpacayan
autotrophic	swa-poṣak
vegetable	sāgpāt
fruit	phalphūl
pollination	parāgsecan
bisexual	ddilingiya
self-pollination	swa-parāgsecan
unisexual	eklingiya
cryptogam	apuṣpak
phanerogam	sapuṣpak
monocotyledonous	ekdaliya
dicotyledonous	duidaliya
micro-organism	suchmajib
parasite	parajiwi
unicellular	ek koṣiya
protoplasm	jibaras
sexual	maithūnik
asexual	amaithūnik

The above table shows that eighteen terms of biology were translated through loan creation.

c. Borrowing

The process of translation is the same as mentioned in 3.3.1.5.

The following table shows the terms of biology that were borrowed from English and transliterated into Nepali.

Table No. 30

SL term (English)	Borrowed term in TL (Nepali)
thalamus	thalāmas
calyx	kyāliks
corolla	korolā
stamen	stāmen
androecium	endrosiyam
gynoecium	gāinosiyam
anther	enthar
ovary	obhari
srigma	stigmā
cytoplasm	sāitoplajmā
catabolism	kyātābolijam
anabolism	enābolijām
xylem	jailam
bonemarrow	bonmyāro
pericardium	perikarḍiyam
sporulation	sporūlesan
vegetative propagation	bhegitetiv propāgesan
enzyme	injāim

The above table shows eighteen terms of biology were borrowed from English and transliterated into Nepali.

d. Paraphrasing

The process of translation is the same as mentioned in 3.3.1.6

The following table shows the terms of biology that were paraphrased into Nepali.

Table No. 31

SL term (English)	Paraphrasing in TL (Nepali)
male gamete	bhāle linga koṣ
female gamete	pothi linga koṣ
ornamental plant	śobhākā lāgiprayog hune biruwā
invertebrate	ḍhāḍ nabhayekā janābar
photosynthesis	parkas saslesn kṛiyā
sperm	bhāle prajanan koṣ
ovum	pothi prajanan koṣ

The above table shows seven terms of biology were paraphrased into Nepali.

Techniques of translation of terms in Biology in Total

Table No. 32

S.N.	Techniques	No of terms	Percentage
1	Literal translation	24	35.82
2	Loan creation	18	26.86
3	Borrowing	18	26.86
4	Paraphrasing	7	10.44

The above table shows the techniques used in translation of terms of biology. The table shows that four techniques are used to translate terms of biology.24(35%) terms out of 67 are translated literally. 18 (26.86%) are translated through loan creation. 28. (26.86%) are borrowed from English and transliterated into Nepali and finally 7 (10.44%) terms are paraphrased in Nepali.

The above table shows that literal translation is the most and paraphrasing is the least frequently used technique in the translation of terms of biology.

3.3.4 Techniques of Translation of Terms of Geology and Astronomy

Of six types of techniques (c.f. 3.3) only the following techniques are adopted to translate the terms of geology and astronomy from English into Nepali.

a. Literal Translation

The process of translation is the same as mentioned in 3.3.1.1

The following table shows the terms of geology and astronomy that were translated literally.

Table No. 33

SL Term (English)	TL term (Nepali)
rock	cattān
sedimentary rock	pariartit cattān
patre cattān	metamorphic rock
volcanic glass	jwālāmukhi sisā
convection	sambāhan
coal	koilā
conglomerate	saṅigutika
marble	siṅigamarmar
gem	ratna
volcano	jwālā ukhi
space	antarisksya
planet	graha
star	tārā
solar system	sauryamaṇḍal
meteor	ulkā
comet	lāmpuchre
pole star	dhruba tārā
virgo	kanyā
great bear	saptaṛisi
gemini	mithun
lybra	tulā

The above table shows that twenty one terms of geology and astronomy were translated literally.

b. Loan Creation

The process of translation is the same as motioned in 3.3.1.2

The following table shows the terms of geology and astronomy that were translated through loan creation.

Table No. 34

SL term (English)	Coined term in TL (Nepali)
fossil	jibāses
lime stone	cunḍhuṅgā
greenhouse	haritgṛha
constellation	tārāmaṇdal
satellite	upagraha
asteroid	sisugraha
meteorite	ulkāpiṇḍa
orion	kālpurus
rigel	mṛgasirā

The above table shows nine terms of geology and astronomy were translated through loan creation.

c. Hybrid Formation

The process of translation is the same as mentioned in 3.3.1.3

The following table shows the terms of geology and astronomy that were translated through hybrid formation.

Table No. 35

SL term(English	TL term(Nepali)
igneous rock	āgneya cattān
plutonic rock	plutonik cattān

The above table shows the two terms of geology and astronomy were translated through hybrid formation.

d. Borrowing (with transliteration in Devanagari script)

The process of translation is the same as mentioned in 3.3.1.5

The following table shows the terms of geology and astronomy that were borrowed from English and translated into Nepali.

Table No. 36

SL term (English)	Borrowed terms in TL (Nepali)
magma	myāgmā
lava	lābhā
crater	kretar
sand stone	syāndiston
silica	silicā
graphite	greaphāit
granite	grenāit

The above table shows the seven terms of geology and astronomy were borrowed from English and translated into Nepali.

Techniques of Translation of Terms of Geology and Astronomy in Total

Table No. 37

S.N.	Technique	No of terms	Percentage
1	Literal translation	21	53.84
2	Loan creation	9	23.68
3	Hybrid formation	2	5.26
4	Borrowing	7	17.94

The above table shows the techniques used in translation of terms of Geology and Astronomy. The table shows that four techniques are used to translate terms of geology and astronomy.21 (53.84) terms are translated literally. 9 (23.68%) terms are translated through loan creation. 2 (5.26) terms are translated through hybrid formation. 7 (17.94%) terms are borrowed from English and transliterated into Nepali.

The above tale shows that literal translation is the most and hybrid formation is the least frequently used technique in the translations of terms for geology and astronomy.

3.3.5 Techniques of Translation of Scientific Symbols, Abbreviations and Acronyms

Of six types of techniques (c.f. 3.3) only the following techniques are adopted to translate terms for scientific symbols, abbreviations and acronyms from English into Nepali:

a. Borrowing with Transliteration in Devanagari Script

The process of translation is the same as mentioned in 3.3.5.

The following table shows the scientific symbols, abbreviations and acronyms that were transliterated into Devanagari script.

Table No. 38

English	Nepali
Kg	kigrā
S	se
K	ke
M	mi
Cm	semi
M/sec	mi/se
MKS	em ke es
CGS	si gi es
FPS	ef pi es

The above table shows nine scientific symbols, abbreviations and acronyms were transliterated into Devanagari script.

b. Borrowing without Translation in Devanagari Script

Some scientific symbols, abbreviations and acronyms are used in TL as they were in the SL.

The following table shows the scientific symbols, abbreviations and acronyms that were borrowed into Nepali without transliteration into Devanagari script.

Table No. 39

SL term (English)	Borrowed term in TL (Nepali)
A	A
P^+	P^+
Cd	cd
e^-	e^-
Mol	Mol
n^o	n^o
N	N
J	J
KW	KW
^oc	^oc
^oF	^oF
He	He
Li	Li
RBC	RBC
WBC	WBC
Mg	Mg
Na	Na
HCL	HCL
Si	Si
K	K
Ca	ca

The above table shows twenty one scientific symbols, abbreviations and acronyms that were borrowed into Nepali without transliteration into Devanagari script.

Technique of Translation of Scientific Symbols, Abbreviations and Acronyms in Total

Table No. 40

S.N.	Technique	No. of terms	Percentage
1	Borrowing		
	i) Borrowing with translation in Devanagari Script	9	30
	ii)Borrowing without translation in Devanagari script	21	70

The above table shows the technique used in the translation of scientific symbols, abbreviations and acronyms from English into Nepali. The table shows that 9 (30 %) terms are borrowed from English into Nepali with translation in Devanagari script whereas 21(70%) terms are borrowed from English into Nepali without being translated in Devanagari script.

The above table shows that the only one technique is used in the translation of scientific symbols, abbreviations and acronyms from English into Nepali

Summary of the Techniques Used to Translate the Technical Terms from English into Nepali.

Table No. 41

Total Number of Terms Used in the Study: 246

SN	Technique	No. of terms	Percentage
1.	Literal translation	93	37.88
2.	Loan creation	40	16.28
3.	Hybrid formation	11	4.47
4.	Loan shift	2	0.81
5.	Borrowing	82	33.33
6.	Paraphrasing	18	7.31

The above table shows the techniques used in the translation of technical terms. The table shows that six techniques are used for the translation of technical terms of science. Out of 246 terms, 93 (37.88%) are translated literally, 40 (16.28%) are translated through loan creation, 11 (4.47%) are translated through hybrid formation, 2(0.81%) are translated through loan shift. 82(33.33) are borrowed form English and transliterated in Nepali and 18(7.31%) are paraphrased into Nepali The above table shows that literal translation and borrowing are frequently adopted techniques and loan shift and hybrid formation the least frequently adopted technique in translation of technical terms of science.

Table No. - 42

The following table shows total number of terms of each category i.e. physic, chemistry, biology, geology and astronomy and symbols, abbreviations and acronyms and their translation techniques

S.N	Technique	Terms of Physics		Terms of chemistry		Terms of Biology		Terms of Geo.& Astro.		Terms for scientific symbol, Abb, & Acro.		Total
		No.of terms	%	No of terms	%	No.of terms	%	No. of terms	%	No. of term	%	
.1	Literal translation	33	48.52	15	35.71	24	35.82	21	53.84	×	×	93
2	Loan creation	9	13.04	4	9.52	18	26.86	9	23.68	×	×	40
3	Hybrid formation	3	4.34	6	14.28	×	×	2	5.26	×	×	11
4	Loan shift	2	2.89	×	×	×	×	×	×	×	×	2
5	Borrowing	15	21.73	12	28.57	18	26.86	7	17.94	30	100	82
6	Paraphrising	6	8.69	5	11.90	7	10.44	×	×	×	×	18
7	Total	68	100	42	100	67	100	39	100	30	100	246

The above table shows that 33 (48.52%) terms of physics, 15 (35.71%) terms of chemistry, 24 (35.82%) terms of biology, 21 (53,84%) terms of geology and astronomy were translated literally, 9 (13.04%) terms of physics, 4 (9.52%) terms of chemistry, 18 (26.86%) terms of biology, 9 (23.86%) terms of geology and astronomy were translated through loan creation, 3 (4.34%) terms of physics, 6 (14.28%) terms of chemistry, 2 (5.26%) terms of geology and astronomy were translated through hybrid formation, 2 (2.89%) terms of physic were translated through loan shift, 15 (21.73%) terms of physics, 12 (28.57%) terms of chemistry, 18 (26.86%) terms of biology, 7 (17.94%) terms of geology and astronomy, 30 (100%) terms of scientific symbols, abbreviations and acronyms were borrowed from English and transliterated in Devanagari script, 6 (6.69%) terms of physics, 5 (11.90%) terms of chemistry and 7 (10.44%) terms of biology were paraphrased into Nepali.

3.4 Linguistic Problems of Translation of Scientific Terms from English into Nepali

On the basis of analysis of English and Nepali terms, the researcher found the following four types of linguistic problems of translation of scientific terms from English into Nepali.

1. Lack of conceptual accuracy
2. Translingual lexical ambiguity
3. Lack of lexicalization of the scientific concepts: lexical gap
4. Lack of preference for already existing TL terms

3.4.1 Lack of conceptual accuracy: conceptual gap

Conceptual gap means the gap between the concepts expressed by the source language and target language terms. It means the TL term does not convey the accurate scientific concept conveyed by the SL terms e.g.

The following table shows the lack of conceptual accuracy of English words into Nepali.

Table No. 43

SL term (English)	TL term (Nepali)
negative terminal	rin dhruba
positive terminal	dhana dhruba
ovary	anda saya

The above table shows three terms of science lack conceptual accuracy in Nepali.

3.4.2 Translingual Lexical Ambiguity

Most of the linguistic problems of translation in general and of the scientific terms in particular emanate from translingual lexical ambiguity which is due variation in lexicalization on different concepts in a certain semantic field. This problem is evident in the case when for a single term in the SL, there are more then one terms in the TL with similar but not identical sense.

e.g.

SL term (English)	TL term (Nepali)
motion	Cāl
	gati
Nuclear energy	āṇawik Śakti
	pāramaṇawik Śakti
compound	yougik
	samyukta
fusion	samāgaman
	samyojan
	milan

Here the translation is faced with the problem of mapping one lexical item and too many possible equivalents.

The main question, in which TL term is to be selected in a particular context to reflect the basic concept of the term the translator should select for example 'samagaman' or 'samayojan' or 'milan' for the SL term fusion. It is usually the case that the selection of one rather than other term is governed by the context in which it is used.

3.4.3 Lack of Lexicalization of the Scientific Terms: Lexical Gap

The fundamental problem involved in the translation of terms arise from that the natural language differs in the matter of lexicalization of the concepts. That is to say, one language (11) may have a lexical items for a particular concept, while another language (12) may not have lexical items in its vocabulary for that concept. This is known as lexical gap.

The following table shows the lexical gap between SL (English) and TL (Nepali)

Table No. 44

SL term (English)	**Paraphrasesed in TL (Nepali)**
candela	prakāśko camkilopanā
propagating medium	dhwani prasāraṇ hune mādhyam
invertebrate	dhād nabhayekā janāwar
photosynthesis	prakas saslesṇ kriyā

Where the SL has a single term for some scientific concepts, the TL has no such term and the translator has to resort to paraphrases to express the same concept to give descriptive and /or functional equivalence.

3.4.4 Lack of Preferences for Existing TL Terms

While translating the SL term into TL terms, the translator does not give preference for the already existed TL term, In such case, there exists a linguistic problem due to lack of preference for already existing TL terms.

The table below shows some examples of lack of preference for existing terms in TL.

Table No. 45

SL term (English)	Hybird term in TL (Nepali)	Existing term in TL (Nepali)
concave mirror	kankebh ainā	antargol
convex mirror	kanbheks ainā	ardha candrākār
lactic acid	lyāktik amla	amilo dudh

The underlined constitutes of the TL hybrid terms are the constituents which are directly borrowed from the SL. Though there exist specific terms in TL to reflect the basic concept of these underlined constitutes, the already existing terms in the TL are not given preference.

CHAPTER FOUR

FINDINGS AND RECOMMENDATIONS

4.1 Findings

On the basis of the analysis and interpretation of the data the finding can be summarized as follows:

4.1.1 Morphological Structure of the terms

a) On the basis of morphological analysis the monomorphemic terms in English are not necessarily monomorphemic in Nepali.

b) Both the processes of single and multiple affixations are applied in the formation of some of the polymorphemic terms in English and Nepali.

c) There are some polymorphic terms in Nepali which are not necessarily translated from English polymorphic terms.

d) The words which are formed by affixation in English are not found following the same process in Nepali. For example, the word 'pressure' is formed by ’press + ure’ but the Nepali translation is ’cāp’ which is monomorphemic and free morpheme.

e) Terms which are formed by compounding in Nepali are not necessarily found formed by the same process in English for example; ’tārāmandal’ is formed by compounding but the word ’ Constellation' is formed by affixation.

f) Terms for element, compound, units, scientific symbols, abbreviation and acronyms are borrowed in Nepali in their current forms as far as possible. The borrowed terms are transliterated in Devanagari script. However, some are scientific symbol abbreviations and acronyms are adopted in Devanagari script.

4.1.2 Techniques of Translation of Technical Terms

a) Six techniques are used to translate the technical terms from English to Nepali which are literal translation, loan creation, hybrid formation, loan shift, borrowing and paraphrasing

b) Literal translation is the most widely used technique in translation of terms for physics chemistry, biology, geology and astronomy.

c) In the translation of terms of physics six techniques are used viz. literal translation, loan creation, hybrid formation, loan shift, borrowing and paraphrasing. Among them literal translation is the most frequently used technique and loan shift is the least frequently used technique in the translation of terms of Physics.

d) Out of Six techniques, five techniques are used in the translation of terms of chemistry which are literal translation, loan creation, hybrid formation, borrowing and paraphrasing. Among them literal translation is the most frequently used technique and loan creation is the least frequently used one.

e) Four translating techniques are used in the translation of terms of biology which are literal translation, loan creation, borrowing and paraphrasing. Among them literal translation is the most and paraphrasing is the least frequently used technique.

f) In the translation of terms of geology and astronomy four techniques are used. They are literal translation, loan creation, hybrid formation and borrowing. Among them literal translation is the most and hybrid formation is the least frequently used technique.

g) Only the borrowing (with transliteration in Devanagari script and with out translation in Devanagari script) is used to translate scientific symbols, abbreviations and acronyms.

h) Out of 246 terms used in the study 93 (37.88%) terms are translated literally 40 (16.28%) terms are translated through loan creation, 11

(4.47%) terms are translated through hybrid formation, 2 (0.81%) terms are translated through loan shift, 82 (33.33%) terms are borrowed from English and transliterated in Nepali and 18 (7.31%) terms are paraphrased into Nepali.

i) In summary, literal translation and borrowing are frequently adopted techniques and loan shift and hybrid formation are the least frequently adopted techniques in the translation of scientific terms.

4.1.3 Linguistic Problems of Translation of Technical Terms

a) When the given SL term has more than one possible translation in the TL, the translator faces the problems of selection of a particular term in a particular context (cf.3.4.2).

b) Several scientific terms are not lexicalized in the Nepali language. As a result, the translator has to resort to the techniques: borrowing or paraphrasing .

c) The translator has not given preference to the already existing lexical terms in Nepali (cf 3.4.4).

4.2 Recommendations

On the basis of the findings form the analysis and interpretation of the data some recommendations for pedagogical implications have been made by the researcher; they are as follows:

a) While translating the scientific terms from English to Nepali, preference should be given to morphemes. So that there could be possibility of faithful translation or real translation and the meaning will not be different. For example 'plants' as biruwā, 'petals', as 'puspadal' and 'vegetables' as 'Sāgapāt better to translate 'biruwaharū,' 'puspadalharū' and 'Sāgapātharu' respectively.

b) Preference should be given to the TL indigenous words which have already gained currency and are widely intelligible to the TL users. For example 'Salt' for which the 'lawan' in Nepali is widely used; 'electricity' for which the word 'bidhut' in Nepali is widely current.

c) The translator should consult a standard bilingual dictionary to find out appropriate context for particular terms. He/she should not sue any equivalent, term that is available in the dictionary. He/she should check its context and appropriateness.

d) Context for the use of the word should be taken in consideration as it becomes extremely important in the translation of scientific terms.

e) All translation techniques should be used to translate technical terms according to their nature and context.

f) Borrowing and paraphrasing techniques should be adopted when the SL term is not lexicalized in TL in order to convey its meaning.

REFERENCES

Aarts, F. and J. Aarts. 1986. *English Syntactic Structure.* Oxford: Pergamon Press

Adhikari, B.R. 2003. *Translation of Technical Terms: A Case of Textbook for Science for grade ix.* An unpublished M. ED. Thesis. Tribhuvan University: Kathmandu.

___. 2004. *Techincal and Cultural Translation.* Kathmandu: Kshitiz Publication.

Adhikari, H.R. 2007. *Samasamayik Nepali Vyakarn.* Kathmandu: Vidhyarthi Pustak Bhandar.

Adhikari, H.R. and B.B. Bhattarai. 2061. *Prayogatmak Nepali Sabda Kos.* Kathmandu: Biddarthi Prakashan.

Bandhu, C.M. 1995. *Adharbhut Prabidhik Shadawali.* Kathmandu: Nepal Rajkiya Prajna Pratisthan.

Bell, R.T. 1991. *Translation and Translating: Theory and Practice.* London: Longman.

Bennett, P.A. et al. 1986. *Multilingual Aspects of Information Technology.* English: Gower Publishing Co. Ltd.

Bhattarai, A. 2001. Writing a Research Proposal. *Journal* of NELTA. Vol-6.

Bhattarai, G.R. 1997. *In Other Words: Sense Versus Word as Unit Literary Translation (with Special Reference to Nepali - English Poetic Texts).* An Unpublished Ph.D. Thesis. Byderabad.

___. 2000. *An Introduction to Translations Studies.* Kathmandu: Ratna Pustak Bhandar.

___. 2001. *A Thematic Analysis of Research Reports.* Kathmandu: Ratna Pustak Bhandar.

Brislin, R.W. (ed.). 1967. *Translation Application and Research.* New York: Gardner Press.

Catford, J.C. 1965. *A Linguistic Theory of Translation.* Oxford: CUP.

Chattopadhyay, D. and P. Madhavan (editors) 1994. *'Lexicon for Translators':* University of Hyderbad.

Chattopadhyaya, D. and P. Madhavan (editors). 1994. *Linguistics for Translators.* Hyderabad: University of Hyderabad.

Chhetry, S.B. 2004. *A Study on the Translation of Technical Terms.* An Unpublished M.Ed. Thesis, T.U., Kathmandu.

Crystal, D. 1997. *'The Cambridge Encyclopedia of Language.* Cambridge: CUP.

Dodegaonkar, P.R. and P. Mohanty (editors). 1994. *Lexicon for Translators and Term Planning.* Hyderabad: University of Hyderabad.

Gentzler, E. 1993. *Contemporary Translation Theories:* Routledge.

Hamro Bigyan: Kaksha Ath. Bhaktapur: Janak Education Materials Center.

Hornby, A.S. 1996. *Oxford Advanced Learner's Dictionary of Current English.* Calcutta: OUP.

Katamba, F. 1993. *Morphology*. London: Macmillian.

Kumar, R. 1999. *'Research Methodology'*. London: Sage publication.

Luitel, K.P. 1996. *Nepali Prakriti Pratyaya Kosh.* Kathmandu.

Newmark, P. 1988. *A Textbook of Translation.* London: Prentice Hall Europe.

Newmark, P. 1981. *'A Textbook of Translation'*. Prentice : Europe Hall.

Nida, E.A. 1964. *Toward a Science of Translating.* Leiden: E.J. Briv.

Our Science: Grade 8. 2001. Bhaktapur: Janak Education Materials Center.

Phyak, P.B. 2005. *Translation Theory*. Kathmandu: Sunlight Publication.

Pokharel, B.K. 1983. *Nepali Brihat Shabdakosh.* Kathmandu: Nepal Rajkiya Prajya Pratisthan

Rawal, S.B. 2007. *Evaluation of Translation: A Case of Textbook of Social Studies Grade VIII.* An Unpublished M.Ed. Thesis. T.U., Kathmandu.

Richards, J. et al. 1999. *Longman Dictionary of Language Teaching and Applied Linguistics.* London: Longman.

Sharma, B.K. 2057. *Nepali Sabda Sagar*. Kathmandu: Bhaba Pustak Bhandar.

Stein, J. 1967. *The Random House Dictionary of the English Language.* New York: Random House.

Turner, R.L. 1931. *A Comparative and Etymological Dictionary of the Nepali Language.* New Delhi: Allied Publishers.

Wilss, W. 1982. *The Science of Translation: Problems and Methods.* Tubingen: Gunter Nart Verlag.

Yadav, Y.P. 2002. *Bhasabiyana (2nd edition).* Kathmandu: New Hira Books Enterprises.

APPENDIX – I

3.3.1 Techniques of Translation of Term in Physics

SL term (English)	TL term (Nepali)
acceleration	prabeg
variable velocity	asamān gati
echo	pratidhwani
magnetism	cumbakatwa
flammable	jwalansil
reaction	pratikṛiyā
chlorophyll	haritkaṇ
beam	kiraṇ punj
reverberation	gunjayamān
concave mirror	kankebh ainā
convex mirror	kanbhekh ainā
dry cell	suṣka śel
mass	piṇda
electricity	bijuli (bidhdhut)
effort	iphort (iphort)
thermometer	tharmāmitar
centimeter	sentimitar
kilometer	kilomitar
measuring cylinder	mejariṇ siliṇdar
pascal	pāskal
ampere	empiyar
volt	bholt
gram	grām
joule	jula
mile	māil
year	yārd
foot	phut
inch	iṇc
second	sekeṇd

candela	parkāś ko camkilopanā
mole	padārth ko mātrā
liquid pressure	taral padārthako cāp
wind mill	hawābāta calne mila
propagation medium	dhwani prasāran hune mādhyām
air pressure	hāwāko cāp

3.3.2 Techniques of Translation of Terms for Chemistry

SL Term (English)	TL Terms (Nepali)
matter	padārtha
compound	yaugik
element	tatwa
copper sulphate	nilotutho
salt	lawaṇ
mixture	miśraṇ
crystal	maṇibh
saturated solution	santriptaghol
acid	amla
base	kṣār
condensation	sanghanan
molecule	aṇu
atomic weight	parmāṇwik bhār
mercury	pāro
lead	śiśā
atomic	paramāṇwik
molecular	āṇawik
crystallization	maṇibhikaraṇ
atom	paramāṇu
hydrochloric acid	hāidroklorik amla
suphric acid	salphyrūrik amla
nitric acid	nāitrik amla
acetic acid	asetiik amla
inert gas	niskriya gyās
dilute sulaphric acid	phikā salphyurik amla
Carbon dioxide	kārbadāiaksāid

Proton	proton
Neutron	nyūtron
electron	ilektron
hydogen	hāidrojan
Oxygen	aksijan
magnesium	myāgnesiyam
nucleus	niyukliyes
centrifuging	śentriphujin
chromatography	kromātogrāphi
lituns	litmas
alcohol	alkohal
lactic acid	amio dudh
citric acid	kāgatiko ras
rusting	khiya lāgnu
copper plate	tāmāko pātā
zinc plate	jastako pata

3.3.3 Techniques of Translation of Terms of Biology

SL term (English)	TL term (Nepali)
mammal	iśtandhāri
environment	wātāwaraṇ
medicinal plant	jadibuti
food plant	khādhya biruwā
wildlife	banyajantu
conservation	samrkṣyaṇ
petal	pûṣpadal
sepal	patradal
fertilization	garbhādhvn kṛiyā
fusion	milan/ samyojan
embryo	bhrūṇ
digestive canal	pãcannali
hard – exoskeleton	kaḍã ãbaraṇ
cell	koṣ

sell wall	koṣ bhittā
plant cell	banaspati kos
[redacted]	poṣaṇ
tissue	
tantū	
heart	
mūtū	
veins	
śirā	
artery	
dhamani	
capillary	
kosikā	
germination	
ankuraṇ	
internal combustion	
bhitrin jwalan	

digestionpācān

metabolism	upāpacayan
autotrophic	swa-poṣak
vegetable	sāgpāt
fruit	phalphūl
pollination	parāgsecan
bisexual	ddilingiya
self-pollination	swa-parāgsecan
unisexual	eklingiya
cryptogam	apuṣpak
phanerogam	sapuṣpak
monocotyledonous	ekdaliya
dicotyledonous	duidaliya
micro-organism	suchmajib
parasite	parajiwi
unicellular	ek koṣiya
protoplasm	jibaras

sexual	maithūnik
asexual	amaithūnik
thalamus	thalāmas
calyx	kyāliks
corolla	korolā
stamen	stāmen
androecium	endrosiyam
gynoecium	gāinosiyam
anther	enthar
ovary	obhari
srigma	stigmā
cytoplasm	sāitoplajmā
catabolism	kyātābolijam
anabolism	enābolijām
xylem	jailam
bonemarrow	bonmyāro
pericardium	perikarḍiyam
sporulation	sporūlesan
vegetative propagation	bhegitetiv propāgesan
enzyme	injāim
male gamete	bhāle linga koṣ
female gamete	pothi linga koṣ
ornamental plant	śobhākā lāgiprayog hune biruwā
invertebrate	ḍhāḍ nabhayekā janābar
photosynthesis	parkas saslesn kṛiyā
sperm	bhāle prajanan koṣ
ovum	pothi prajanan koṣ

3.3.4 Techniques of Translation of Terms of Geology and Astronomy

SL Term (Eng lish)	**TL term (Nepali)**
rock	cattān
sedimentary rock	pariartit cattān
patre cattān	metamorphic rock
volcanic glass	jwālāmukhi sisā
convection	sambāhan
coal	koilā

conglomerate	saṅigutika
marble	siṅigamarmar
gem	ratna
volcano	jwālā ukhi
space	antarisksya
planet	graha
star	tārā
solar system	sauryamaṇḍal
meteor	ulkā
comet	lāmpuchre
pole star	dhruba tārā
virgo	kanyā
great bear	saptaṛisi
gemini	mithun
lybra	tulā
fossil	jibāses
lime stone	cunḍhuṅgā
greenhouse	haritgṛha
constellation	tārāmaṇdal
satellite	upagraha
asteroid	sisugraha
meteorite	ulkāpiṇḍa
orion	kālpurus
rigel	mṛgasirā
igneous rock	āgneya cattān
plutonic rock	plutonik cattān
magma	myāgmā
lava	lābhā
crater	kretar
sand stone	syāndiston
silica	silicā
graphite	greaphāit
granite	grenāit

3.3.5 Techniques of Translation of Scientific Symbols, Abbreviations and Acronyms

English	Nepali
Kg	kigrā
S	se
K	ke
M	mi
Cm	semi
M/sec	mi/se
MKS	em ke es
CGS	si gi es
FPS	ef pi es

SL term (English)	Borrowed term in TL (Nepali)
A	A
P^{+}	P^{+}
Cd	cd
e^{-}	e^{-}
Mol	Mol
n^{o}	n^{o}
N	N
J	J
KW	KW
^{o}c	^{o}c
^{o}F	^{o}F
He	He
Li	Li
RBC	RBC
WBC	WBC
Mg	Mg
Na	Na
HCL	HCL
Si	Si
K	K
Ca	ca

APPENDIX – II

3.1.1.1 English Scientific Monomorphemic Terms

boron	marble
salt	lead
gem	neon
argon	crystal
mercury	alcohol
gram	meter
mile	yard
foot	inch
second	sound
minute	hour
watt	joule
newton	pascal
ampere	volt
stomach	liver
tissue	heart
artery	vein
venue	testis
mass	speed
sound	echo
atom	ray
mammal	matter
compound	calyx
light	beam
power	litmus
force	lava
rock	volcano

space

comet

virgo

gemini

satellite

fossil

gneiss

star

orion

virgil

libra

coal

planet

orbit

APPENDIX – III

The Structure of English Science Complex Terms

Prefix	**root**	**suffix**	**derived words**
tele-	scope		telescope
exo-	sphere		exosphere
para-	sit		paraite
dia-	meter		diameter
	magnet	-ism	magnetism
	magnesia	-ium	magnesium
	corona	-ule	corolla
	digest	-ion	digestion
	metabo(e)	-ism	magnesium
	pulmon	-ary	pulmonary
	xyle	-eme	xylem
	weigh-	-t	weigh
	mag-	-ma	magma
	grave	-ity	gravity
	dense	-ity	density
	pressure	-pure	pressure
	frict	-ion	friction
	mixed	-ure	mixture
	sex	-al	sexual
	ovum	-ary	ovary
	flame	-able	flammable
	nutria	-ion	nutrition
	capill	-ary	capillary
	graphit	-ite	granite
	organ	-ic	organic
	environ	-ment	environment
	excrete-	+ -ion	excretion
	silice-	+ -a	silica
	ventrie-	+ -cle	ventriecle
	stig-	+ -ma	stigma
	aster(o)	+ite	meteorite

Prefix	Root	Suffix	Derived word
a-	Sex	-al	Asexual
Centric	Fug	-ing	Centrifuging
Con-	Glomer	-ate	Conglomerate
Bi-	Sex	-al	Bisexual
Di-	Cotyledon	-ous	Monocotyledonous
Mono-	Cotyledon	Ous	Monocotyledonous
Re-	Generate	-ion	Regeneration

Micro-	Organ	-ism	Micro-organism
re-	act	-ion	Reaction
Dis-	Intrigate	-ion	Disintrigation
ac-	Celer	-ate + ion	Acceleration
con-	Dense	-ate + ion	Constellation
In	Verte	-bra + ate	Inuerteberation
re-	Verbe	-ate + ion	Reuerbenation
uni-	Celi	-ule + ar	Unicellular
pro-	Pag	-ate + ion	Propagation
	Crystall	-ize + ation	Crystallization
	Fertile	-ize + ation	Fertilizatoion
	Mole	-cula + ar	Molecular
	Germin	-al +ation	Germination
	Palmen	-ary + ic	Pulmonic
	Temper	-ate + ure	Temperature
	Pollen	-ate + ion	Pollination
	Spore	-ule + atetion	Sporulaion
	Conuect	+ion	Convection
Wara + ā	Waraṇ		Watawaraṇ

APPENDIX – IV

Nepali Scientific Monomorphemic Terms

Nepali Term	English Equivalent
cāp	pressure
kiraṇ	ray
tāp	heat
bal	force
beg	speed
cāl	motion
aṇu	atom
lawaṇ	salt
maṇibha	crystal
amla	acid
kṣār	base
bhrun	embryo
tantu	tissue
cattān	rock
bijuli	electricity
ratna	gem
graha	planet
ūlkā	meteor
mithun	gemini
tulā	lybra
Śirā	veins
koilā	coal
Pinda	mass
kanyā	virgo
mutu	heart

APPENDIX - V

The Structure of Nepali Scientific Complex Terms

Prefix	Root	Suffix	Derived word
Prati-	Dhoni		pratidhoni
prati-	kriyā		pratikṛiya
Pra-	Kaś		prakāś
Param-	aṇu		paramāṇu
miṣra	aṇ		Miṣraṇ
Para-	Jiwi		Sambāhan
Sama-	Yojan		Sām yojan
	Guru	-twa	Gurutwa
	Ghana	-twa	Ghanatwa
	Gam	-ti	Gati
	ghṛş	-an	Gharşaṇ
	tāp	$K_r$am	Tāpkram
	Anu	Ik	āṇwin
	Dhon	I	Dhoni
	Harit	kaṇ	Haritkaṇ
	Jwalan	śila	Jwalanśila
	Samarth	Ya	Sāmarthya
	Yog	ik	Yaugik
	Antar	Iksh	Antarikşya
	tar	Ā	Tārā
	Śaka	Ti	Śakti
	kṛi	Ya	Kārya
	Pada	Artha	Padārtha
	Tat	Twa	Tatwa
	Istan	Dhari	Istandh
	Parāg	Secan	Parāgsecan
	Mila	Ana	Milan
	aṅkura	An	Aṅkuran
	Dham	Ani	Dhamani
	Koś	ikā	Kośikā
	Maithun	Ik	Maithunik
	Dāl	Han	Dalhan
	Puşpa	Dal	Puşpadal
	Patra	Dal	Patradal

Prefix	Root	Suffix	Derived
Uta	Tula	Ak	Uttolak
ā	Yata	An	Āyatan
Param	Anu	Ik	Paramāṇwik
Ddi	Linga	Ia	ekliṅgiya
Ek	linga	Ia	Eklingiya
A	puṣpa	Ka	apuṣpak
Sa	Puspa	Ka	sapuṣpak
Ek	Dal	Iya	Ekdaliya
Dui	Dal	Iya	Duidaliya
Nis	Kās	An	Niskāsan
A	Maithun	Ik	amaithunik

APPENDIX – VI

Roman Transliteration of Devanagari Script Based on Turner's (1931). Nepali Alphabet and Diacritic Marks.

Phonetic Symbols used in the Thesis:

a	अ		k	क	क
ā	आ	ा	kh	ख	ख
i	इ	ि	g	ग	ग
Ī	ई	ी	gh	घ	घ
u	उ	ु	ṅ	ङ	
ū	ऊ	ू	c	च	च
ṛ	ऋ	ृ	ch	छ	
e	ए	े	j	ज	ज
ai	ऐ	ै	ñ	ञ	ञ
o	ओ	ो	ṭ	ट	
au	औ	ौ	ṭh	ठ	
–	ं		ḍ	ड	
ṇ	ण	ण	ḍh	ढ	
t	त	त	bh	भ	भ
th	थ	थ	m	म	म
d	द		y	य	
dh	ध	ध	r	र	◌
n	न	न	l	ल	ल
p	प	प	w	व	व
ph	फ	फ	ś	श	श
b	ब	ब	ṣ	ष	ष
			s	स	स
			h	ह	

Note: The traditional letters क्ष, त्र and ज्ञ are treated as conjunct letters

e.g. क्ष = ks, ksh, kch
ज्ञ = gy
त्र = tr