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CREATION AND IMPLEMENTATION OF A TRANSLATION
MEMORY FOR THE UNDERGRADUATED PROGRAMS OF
THE 54 CAREERS BELONGING TO UMSA

Degree Project submitted to obtain Academic Degree in Linguistics and Languages

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CREATION AND IMPLEMENTATION OF A TRANSLATION MEMORY FOR THE
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UMSA

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DEDICATION

This degree project is dedicated with all my love to my dear mother **Maria Zambrana Sea** and my sister Sirley Giobana Perez Zambrana, whose support inspired me along the way.

I dedicate this to my father's memory **Jaime Perez Pacheco** (†) and my brother's memory **Deyvis Jaime Perez Zambrana** (†), who guide me from heaven every day in my heart. Also, to all the people that made this project possible.

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ABSTRACT

The degree project, “Creation and implementation of a translation memory for the undergraduate programs of the 54 careers belonging to UMSA”, intends to contribute to CETI through the development of an automated translation software applied to transcripts. Its purpose is to demonstrate that automated translation technology improves the quality of the translator’s job. Furthermore, the demand of translation services for academic purposes increases the need for translation tools; such as Computer-Assisted Translation (CAT).

This project proposal helps the translators at CETI with the translation of the certificate conferred by San Andres University to the students (which is known as *certificado de notas*). On the other hand, this project will compile the terms from the translation of grade certificates for future edition of academic documents.

The process of creating a translation memory for automated translation of undergraduate programs was divided in three steps. The first step was the collection of the 54 careers study programs. After this, the translation of the subjects one by one according to the context of each subject translated. Lastly, the creation of the translation memory.

At the same time, this memory was divided into three stages as well: the first one consists of making the error correction of translation; the second one is to transcribe term by term; and the third one validates each word translated using three sources: IATE, LINGUEE, and PROZ. The development of this project will help translators at CETI and also UMSA translation students. It will as well serve to the evaluation of data inserted into a translation memory called SISTRACEN (*Sistema de Traducción de Certificados*). This memory system will provide an automated translation using layout and memory of more than three thousand terms.

In addition, this project aims to be a useful tool for the Linguistic and Language Department at UMSA too, in order to enhance software translation by making the most of CAT software.

Keywords: *CAT (Computer Assisted Translation), translation memory, transcripts, project.*

RESUMEN

El actual proyecto de fin de carrera titulado "Creación de una memoria de traducción para los programas de grado de las 54 carreras pertenecientes a la UMSA" pretende contribuir a los traductores del CETI mediante el desarrollo de un software de traducción automática aplicado al expediente académico. Su propósito es demostrar la importancia de la tecnología en la traducción y cómo el software de traducción mejora la calidad del trabajo del traductor a través del uso de herramientas de traducción automática. Además, la demanda de servicios de traducción con fines académicos aumenta la necesidad de contar con herramientas de traducción, entre ellas la traducción asistida por ordenador (TAO).

Este proyecto de grado contribuirá a que los traductores del CETI traduzcan los programas de estudio que la UMSA otorga a los estudiantes. Así mismo, se desarrolló la compilación de la terminología a partir de la traducción de los certificados de notas para la post edición de los documentos académicos.

El presente trabajo muestra el proceso de creación de una memoria de traducción a través de la creación de una memoria de traducción para la traducción automática de los certificados de notas de notas en tres pasos. El primer paso que se cubrió fue la recopilación de los 54 programas de estudio de las carreras. Luego, se procedió con la traducción de las asignaturas una por una según el contexto de la disciplina de estudio a la que pertenece cada asignatura traducida. Finalmente, se trabajó con la alimentación de la memoria de traducción, la cual se dividió, a su vez, en otras tres etapas: la primera, para realizar la corrección de errores de traducción; la segunda, para la transcripción término por término; y finalmente la validación de cada palabra traducida utilizando tres fuentes: IATE, LINGUEE y PROZ.

El desarrollo de este proyecto será de utilidad tanto para traductores de CETI, estudiantes de traducción de la UMSA, así como para la evaluación de los datos insertados en una memoria de traducción llamada SISTRACEN.

Esta memoria permitirá llevar a cabo una traducción automatizada utilizando la memoria de más de tres mil términos.

Adicionalmente, este proyecto pretende que la carrera de Lingüística e Idiomas de la UMSA mejore el trabajo de traducción aprovechando las ventajas del software de traducción TAO.

Palabras Clave: TAO (*Traducción Asistida por Ordenador*), *memoria de traducción, certificado de notas, proyecto.*

INTRODUCTION

The project: Creation of a Translation Memory for the Undergraduate Programs of the 54 careers belonging to UMSA aims to develop translation technology for academic documents. Technical translation processes are being used increasingly and applied through automatic translation software systems, and for this reason it is important to automate translations processes in local institutions.

Center for Teaching and Translation of Languages (CETI), dependent on the Linguistics and Languages Department of UMSA, its second main activity is the certified translation of documents. The academic transcripts are required documents by students seeking scholarship opportunities, internships or degree's validation at foreign universities. Improve the efficiency and effectiveness required when translating transcripts in order to reduce time and costs.

The purpose of this degree project is to create a translation memory with validated terms for CETI translators. The translation memory provided SISTRACEN (System of Translation of Grade Certificate) is a CAT (Computer Aided Translation) translation software. As a result of completing a needs analysis questionnaire, it has been found necessary to implement such software.

The translation memory that feeds (CAT) software uses the translation algorithm proposed by Roger T. Bell. A computer algorithm is a set of defined, ordered and bounded instructions to solve a problem or perform a task.

The SISTRACEN software offers a possible solution for the technical translation of transcripts. This algorithm aims to explain the linguistic meaning of translation and how automated translation is developed, based on linguistic theory.

In summary, the needs analysis carried out on translators and former translators of CETI are reflected in the SWOT (Strengths, Weaknesses, Opportunities and Threats).

It shows that among translation memory tools, layout design is the most complex in its development. The document design takes more time than the translation itself.

However, all the processes involved in the creation of a translation memory will streamline the translator's work. For this reason, the intervention proposal aims to encourage the use of technologies in translation.

CHAPTER I

SITUATIONAL SECTION

The first chapter of this project refers to the institutional data, the needs analysis, the questionnaires filled out by translators, and the problem statement. The institution history and the questionnaires applied along with their relevant answers will be exposed in this section, along with the general objective, the research question, and the justification; which are the basis of this research project. Finally, at the end of this chapter the stages of the project will be explained briefly.

1.1 INSTITUTIONAL FRAMEWORK

The CETI translation center is part of the Linguistics and Languages Department. The degree project developed takes into account the mission and vision of CETI, as well as its years of experience in certified translation.

1.1.1 Background of “Centro de Enseñanza y Traducción de Idiomas”

In 1993, the Linguistics and Language Department from UMSA, based on the experience acquired, made the decision of restructuring with two fundamental ingredients: the incorporation of linguistics subjects, and the creation of the Center for Teaching and Translation of Languages (CETI), which purpose is to offer language courses and provide translation services.

Due to the growing demand of students in the English language throughout the university community of San Andres University, through the Center for Teaching and Translation of Languages (CETI) English courses are provided to all the careers of the different faculties of the University. In this way, the courses will have the purpose of specializing in the native or foreign language (Linguistic and Language Department, 2021, pp. 12-13).

The Center for Language Teaching and Translation's main objective is to develop communicative competence, which implies effectiveness, efficiency. CETI trains students in languages with academic excellence to contribute to the current demand for professionals who can communicate in more than one language. CETI's document translation services are open to the professional and student (CETI-UMSA-LIN, 2021, p. 5).

CETI's primary purpose is language teaching. In addition to this, services of translation documents and academic processes are open to the community, thus achieving optimal support in the field of translation.

1.1.2 Mission and Vision of CETI

CETI was born as a project to be part of the Linguistic and Language Department of UMSA University. The institution looks for the improvement and technological implementation at CETI.

1.1.2.1 Mission

ENG: To be a leading University Academic Unit in the field of providing translation services and teaching of foreign and native languages to university students, schools, private and state institutions, applying innovative methodologies, which results from incompetent people with better opportunities to perform efficiently and respond to the needs of Bolivian society. (PROYECTO ESTRELLA, 2012-2014)

SPA: *“Ser una Unidad Académica Universitaria líder en el campo de la prestación de servicios de traducción y enseñanza de idiomas extranjeros y nativos a estudiantes universitarios, de colegios, instituciones privadas y estatales, aplicando metodologías innovadoras, lo que da como resultado personas competentes y con mejores oportunidades para desempeñarse eficientemente y responder a las necesidades que la sociedad boliviana les plantea.”*

1.1.2.2 Vision

ENG: “We are a university unit that provides translation services and Teaching of Foreign and Native Languages, with extensive experience in the field of training young university students, professionals and adults, whose preparation includes the development of communication skills and abilities, and language translation, application of innovative methodologies, the practice of strong moral and ethical values and the strengthening of the spirit of service; which allows them to train with excellence” (PROYECTO ESTRELLA, 2012-2014).

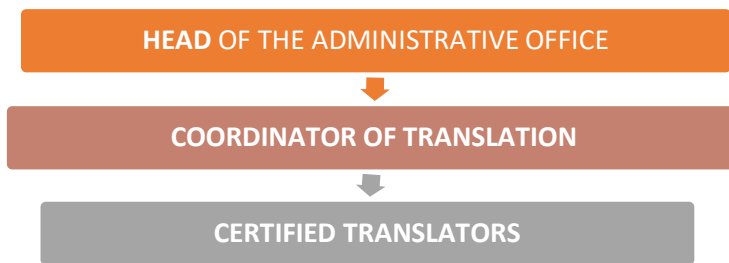
SP: “Ser una Unidad Académica Universitaria líder en el campo de la prestación de servicios de traducción y enseñanza de idiomas extranjeros y nativos a estudiantes universitarios, de colegios, instituciones privadas y estatales, aplicando metodologías innovadoras, lo que da

como resultado personas competentes y con mejores oportunidades para desempeñarse eficientemente y responder a las necesidades que la sociedad boliviana les plantea.”

1.1.3 Technical Aspects and Offices of CETI

According to the data provided in the needs analysis questionnaire and the experience of translators who have been part of the CETI, in the last 6 years, the results point out: a translation is consider translation project assigned to an official translator. Translators often have their document translation and layout technology tools to reproduce the document in its English form and design.

GRAPHIC 1: *The Organigram of CETI*



Source: (PROYECTO ESTRELLA, 2012-2014)

1.1.4 Need Analysis Questionnaire

Since the translation service provided at CETI does not take into account the use of the technology in term of using translation memories or CAT, the motivation to carry out this project was to improve the service provided in the translation department of CETI. This technology will serve translators to do their work faster and more efficiently.

With the creation of the translation memory and the use of automatic translation, the projects could be finished in a shorter period of time. However, it has to be mentioned that the documents to be employed for this purpose are the undergraduate programs from the different careers at San Andres University.

The undergraduate programs translation is a process that involves two disciplines: the translation and the use of automated translation. This project will focus in the area of

translation and creation of a translation memory to increase efficiency and reduce the time in translation work.

The translation concerning this area has grown a lot in recent years, so this degree project aims to cover two aspects:

1. The creation of a computer-assisted translation tool, which means to create a translation memory with all the undergraduate programs from UMSA University.
2. The automatic translation using translation memories to reduce the translation time for this type of documents.

Everything previously mentioned leads to propose the implementation of automatic translation software developed by this degree project. For this purpose, the needs analysis has been taken as the basis for the preparation of the project. And as a result, SISTRACEN system was designed, which as a translation memory for the automatic translation of grade certificates.

1.1.4.1 Translators Relevant Answers

The needs questionnaire carried out during July of 2019 provided enriching criteria for the development of this project. CETI translators shared details about their time at the institution. First, transcripts are the most required type of documents to be translated. Second, the technical translation of documents requires a literal translation technique for the most part. Third, the automation of translation processes can improve the efficiency and effectiveness of translators' work.

The questionnaire of open questions was applied to translators who have worked in the last five years at CETI, in order to obtain as much information as possible. This will also allow contextualizing the project to the need's analysis.

1.1.4.2 Instrument

In order to find out how the service is provided in the translation department belonging to CETI a qualitative research questionnaire was applied. This questionnaire consisted of multiple-choice answers for students and open-ended questions for translators from CETI, at UMSA, in La Paz city.

A second diagnostic questionnaire was also applied to translation students at English Department of the second semester in 2019. This questionnaire contained multiple choice answers, which were designed to obtain data answers from students regarding their general knowledge in translation technology. On the other hand, the questionnaire for translators had open-ended questions, designed to find out their experience gained during their years working at CETI. The answers of translators were enriching for this project, to point out the most required documents in translation, translation time and the organization of translators within the CETI.

The questionnaire applied to CETI translators has ten open questions related to their experience with the translation service, their knowledge and experience in the translation of undergraduate programs, the uses of translation memories and use of CAT and the information about the more required documents to be translated.

The application of this instrument enables to identify the importance of creating a translation memory for automatic translation of the UMSA undergraduate programs using Computer Assisted Translation (CAT).

1.1.4.3 Diagnostic Results of Need Analysis

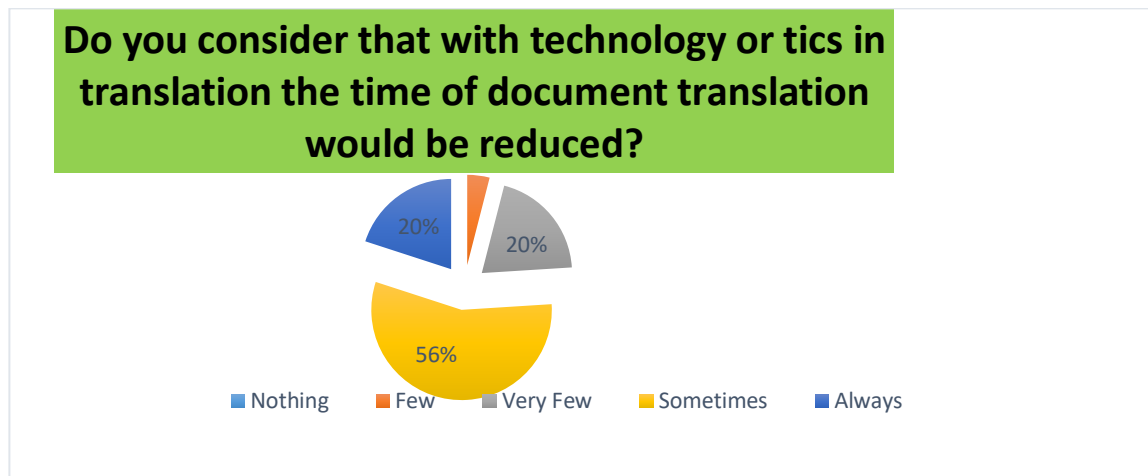
It is noticeable that the creation of translation memories would be a good proposal for CETI. To obtain better information about the needs of the institution, a diagnostic questionnaire was carried out for translators that work at CETI.

The identified problem is related to the student's requirement for translation of academic documents in shorter time. The translation of these academic documents takes three days giving the students fewer opportunities for applying to scholarships, post degree studies

and others. Furthermore, there are not standardized translation memories because of the lack of a terminological management referring to this area.

RESULTS OF THE STUDENTS' DIAGNOSTIC TEST DATA ANALYSIS

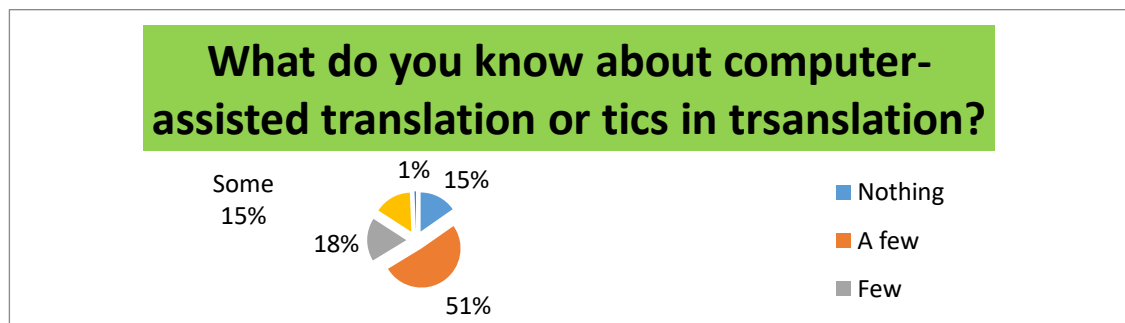
GRAPHIC 2: FIRST QUESTIONNAIRE ANALYSIS



Source: Own elaboration from the questionnaire carried out on July 2019

INTERPRETATION Q: The chart shows the answers of 50 students from Linguistics and Languages Department, who provided the following information: 2 students answered that there is little need of technology. 28 students answered that they believe that sometimes the use of technology could help to improve the translation process. And 10 students answered that they totally believe that technology would help to improve the translation process.

GRAPHIC 3: SECOND ANALYSIS QUESTIONNAIRE



SOURCE: Own elaboration from the questionnaire carried out on July 2019

INTERPRETATION Q-: The results showed that 20 students representing 40% of the total participants told that they know very little about Computer Assisted Translation. While the other percentage, 9 students, know something about this topic, and another 7 students admitted not to have any idea about the automated translation with the use of CAT.

1.1.5 S.W.O.T

In order to have a complete knowledge of the CETI Translation Center, a SWOT analysis was developed. This is a structured method used to indicate the strengths, weaknesses, opportunities and threats involved in this project. SWOT. This type of analysis was originally developed for business and education.

TABLE1. S.W.O.T

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> -The Department of Linguistics and Languages has a center that offers the translation service known as CETI. -The mission and vision of CETI looks for ways to improve translator tools. - CETI's offer technical certified translation of legal and academic documents. 	<ul style="list-style-type: none"> -The Linguistics and Language Department that directs CETI does not teach TICs in translation. - Lack of CAT for transcripts translation memories. -The lack of knowledge of (CAT). -Deficiency knowledge regarding the creation of TICs in translation memories in the computational aspect and their proper functioning. 	<ul style="list-style-type: none"> -It is possible to create a computer-assisted translation (CAT) database of the undergraduate programs at UMSA. -It is possible to use the technical translation depending on areas of study to prepare a translation memory. - There will be a proposal of a technology innovation in benefit students and translators at CETI. -A project that could help students to make deeper research's in future studies needs to be developed. 	<ul style="list-style-type: none"> -Not much investigation in translation TICs. - Web automated translation with artificial intelligence. - Changes in the structure of academic documents. - The change of study programs that are constantly renovated could make the translation memory unnecessary.

Source: Own Elaboration

The CETI Translation Center has strengths that could contribute to the creation and implementation of translation memories, as the present project intends to propose. According to the needs analysis questionnaire, most of the participants have knowledge in translation tools.

Therefore, the creation of translation memories can be useful for translators. Furthermore, technology improves more frequently in all aspects of daily life, as a consequence career subjects are getting more specific (depending on the field of study). For example, the subject of calculus is one of the common subjects among several careers, but its translation is different.

Furthermore, translators are the first beneficiaries of this project, which aims to provide them with an efficient and effective machine translation tool. Consequently, there are three sources of validation of terms that ensure the development of this work and direct links to each term. As a result, these opportunities also benefit the implementation of a translation memory.

On the contrary, there are some weaknesses and threats such as the constant renewal of the pensums, and these will need to be updated in the software that has been developed in SISTRACEN. In addition, it is true that translation memories are not available for the transcripts. However, this project also includes the translation memory with the bibliographic sources of terminological validation.

To conclude, the needs analysis showed that the strengths and opportunities of CETI create a good context for the implementation of this project. The weaknesses and threats are obstacles that do not end with the implementation of the project, but new ideas for the development of translation memories and automatic translation software could arise.

1.2 JUSTIFICATION

The main reasons for this project are the following: first, to reduce the time in the translation process. Second, to combine technology and translation. Third, to create and implement translation memories in undergraduate programs. Fourth, to implement more translation machine on academic documents. Finally, to provide a technological

database service for automatic translation through CAT (Computer Assisted Translation).

The field of automated translation (AT) and computer-assisted translation (CAT) grew since the 1950s, when the need for translation began to expand exponentially, while the productivity of translators remained constant. The creation of expensive and time-consuming and money-consuming corporations, as well as globalization, makes the immediate availability of texts in different languages. For this reasons, online automatic translators are increasingly required. Since the mid-sixties, companies looked for a method to use computers to help translators, and then came CAT systems were developed.

The current project was developed due to the lack of a translation memory for transcription of 54 degrees at UMSA University. This information can be used in order to teach technical strategies for developing and using translation memories to the linguistics students of UMSA. While other works provided innovative ideas on translation memories in conferred degrees, medicine, films, and others, they do not work in transcribing qualifications for 54 UMSA majors.

SISTRACEN (Transcripts Certificate Translation System) is a CAT software that gives efficiency and effectiveness to the CETI translation department to show relevant data on how machine translation is performed using technology that reduced translation time. In addition, it has been fed with a translation memory of more than three thousand validated terms in relation to the study programs.

The main benefits would be that the methodology used in this research could be implemented for the development of translation manuals for a more efficient use of translation memories in technical translation. The use of technology in different disciplines will add interdisciplinarity to the work of translators. Furthermore, translators will benefit from having a CAT tool in their work. The translation technology of an academic document that has a secure and standardized database can support the translation process. However, it is important to perform carefully the subsequent editing and revision processes of the translation to give quality to the translation work.

In this sense, this work is justified by the development of the automatic translation program called SISTRACEN, which was carried out for the translation of transcripts of qualifications conferred by UMSA University in its fifty-four careers. As a result, the translation memory, obtains the feeding of a software for the translation tool use in academic documents. Likewise, through the use of this CAT program, the transcripts of the 54 study programs were translated, after which all study programs were translated in a standardized way. Transcripts are translated in less than 5 minutes.

1.3 STATEMENT OF THE PROBLEM

According to Tintaya (2008), the degree project is a qualification modality to obtain the bachelor's degree. The main objective of a degree project is to demonstrate the skills of proposing solutions to a problem by a proposal that implies the processes that are followed in its preparation.

1.3.1 Description of the problem

The translation and technology work together by providing assistance to the translator in the different processes of the work. The idea of this project is to develop a translation memory based on the translation of the undergraduate programs from different grades transcript of 54 careers of the 13 faculties at UMSA.

A student's requests of grades transcripts translation or granted degrees' translation takes around three days, as a result of the lack of a translation memory on a data base. With the systematization proposed in this project, the work would be developed in less time.

The translator in this sense would only need to identify the correct equivalences from SISTRACEN and to check the translation before preprint it.

1.3.2 Research Question

This grade project will be guided by the following research questions:

-Why is it important to create a translation memory for the undergraduate programs of the 54 careers belonging to UMSA?

-How can CETI's translation staff improve the effectiveness and accuracy on their technical translations especially when they involve the use of translation memories on it?

-How is the development of a translation memory and feed a CAT (Computer Assisted Translation) for academic documents from the careers belonging to UMSA University?

1.4 PROJECT PROPOSAL

In order to improve the quality and streamline the service of the translation related to the undergraduate program, this project will cover the following aspects:

1. To translate and look for every single term found in the undergraduate program consulting some reliable sources.
2. To create a translation memory of the undergraduate programs of the 54 university careers.
3. To develop the Computer Assisted Translation for automatic translation of the undergraduate programs from UMSA University.

The need for the creation of this project is mostly related to the efficiency and effectiveness to the translation of grades transcript, documents that are required to be translated constantly by students at university. The use of CAT and inserting the undergraduate programs in a data base has to do with the fact that it provides to the translators a tool to use a translation memory and therefore a possible solution to the translation of undergraduate programs, making possible to translate in less time.

“This virtual tool helps when translating as it saves time in the translation process and consequently in delivering the work to the client” (Figueroa, 2014, p. 13).

1.4.1 Objectives

1.4.1.1 General Objectives

To create a translation memory for automatic translation of the UMSA undergraduate programs, using computer assisted translation in contribution to CETI translators.

1.4.1.2 Specific Objectives

- To design a database of the study programs in the translation of academic documents from Spanish into English at CETI.
- To develop a translation memory and feed a CAT (Computer Assisted Translation) for academic documents like the study programs from the careers belonging to UMSA University.

1.4.2 Stages of the Project

To introduce the project stages, the following explanation of the steps will state a general idea: The development of a project for sure includes more steps than just the main ones. The project follows steps chronologically to the reach of the objectives.

TABLE 2: *The organization carried out for the project is mentioned of SISTRACEN creation.*

STAGE	ACTIVITY	DESCRIPTION
1st	Translation of every single term found in the undergraduate program consulting reliable sources.	<ul style="list-style-type: none">-During this period 54 study programs had been found.The idea was developed considering originality.-The presentation of the written proposal for the acceptance of degree project-The tutor and student received the acceptance letter from the Council of the Linguistic Department because of the viability of the project.

- | | | |
|------------|--|--|
| 2nd | Creation of a translation memory of the undergraduate programs of the 54 university degrees. | <p>-This period started with the translation of terms. The total subjects to be translated are 3332, distributed in 54 careers.</p> <p>-Then, there will be a validation process using some webpages with corpus base on academic writing.</p> |
| 3rd | Development of Computer-Assisted Translation for automated translation of the undergraduate programs at UMSA University. | <p>- The implementation of the CAT tool for the translation of grades transcript.</p> <p>-The preparation of the written document describing the entire project and the assessment.</p> |

Source: Own Elaboration

This project is divided in three different stages. The first step is to design a database of the study programs in the translation of academic documents from Spanish to English at CETI. The second step is to join all the pensums from the 54 undergraduate programs. The third stage is to develop a translation memory and feed a CAT (Computer Assisted Translation) for academic documents like the study programs from the careers belonging to UMSA University.

The last stage of this paper is focused on evaluating the results collected to analyze the possible implementation of SISTRACEN as a proposal TM in order to measure the possible use of translation memory linked to a CAT tool at CETI.

CHAPTER II

THEORETICAL FRAMEWORK

This chapter developed theoretical description in two phases: the works previously carried out with the thematic of traductology and technology (three research papers) and their disadvantages and differences concerning to the project. On the other hand, concepts that help to understand SISTRACEN and the automatic translation with CAT software have been logically organized.

2. REFERENTIAL BACKGROUND

For a better understanding of translation memories, the theoretical framework starts with a referential framework. Three research papers in translation memories previously developed are mentioned in the reference background to highlight the research papers carried out in the last years to find differences with the previous ones. SISTRACEN was uploaded as software and now can be accessed from a computer connected to the Internet and not necessarily in the offices of the Translation Center.

2.1 Previous papers develop on Translation Memories

In the Linguistics and Languages Career at UMSA university, several studies on translation and technology were developed (thesis, guided works, and degree projects). One of these is LMT, which is a model of explanation that seeks to reduce costs and improve the efficiency and effectiveness of tools for translators. Three examples of these are being mentioned, referring to their advantages, disadvantages, and differences with this degree project.

The first research work developed concerning traductology is the directed work titled: *The systematization of translated documents through the implementation of translation memories carried out during the 2015 management*. The advantages of this research are the following:

This Guided Project carried out at the CETI intends to present an overview of developments in translation, to encourage the use of Translation Memories and their positive interaction with translators as a step towards the development of the institution. The main goal is to systematize previously translated documents and store them in a database.

The disadvantage of GESTRA, a program developed for the management and storage of translation memories at CETI, is that it is one of the pioneer research works with translation memories. Nevertheless, this program had several limitations. One of them is that GESTRA was not uploaded to the Internet, which could be difficult to use this tool outside the institution (Soruco, 2015).

The second research work to highlight is that of Esther Lequipe: *“Translation of Academic-Legal Document Titles and Development of Terminology for the Automatic Translation of University Degrees Presented in the 2015 Management”*.

One of the advantages of this research work is that academic-legal documents were translated from English to Spanish and from Spanish to English for the CETI Translation Center. This had been carried out according to a needs analysis of the Translation Center which concluded that the most required translations are the translation of academic documents. At the same time, it highlights the need to develop glossaries, specialized terminologies, and other tools. Another advantage was the implementation of the SISTRATU computer system for the automatic translation of university degrees (Lequipe, 2015).

The disadvantages, on the other hand, are the following: when interviewing the creators of SISTRATU they indicated that they did not know if they were still using this system at CETI today. In addition, the program developed was only for academic diplomas and not for other kinds of documents. Finally, the program does not have a translation algorithm for software, but only the document layout to insert the data to translate.

Alvarado (2013), in the third investigation paper concerning the needs found in the CETI, states that the objective of the guided work is to improve the translation process in CETI. This topic was carried out through software implementation and creation of a database, selection, and technical terminology. The software they created has database functions that meet criteria; such as storing data, managing and retrieving data that will aid in the organization of terminology through the process of translation. The disadvantages of the project centrally have to do with the terminological validation, which do not correspond specifically to a document typology.

2.2 TRADUCTOLOGY

The technical translation of legal and academic documents involves the participation of the translators, who determine the meaning through lexical, syntactic, and semantic analysis. Subsequently, they carry out a grammatical structural analysis of the original text, taking into account the communication and context, and then reformulate the same meaning using the lexicon and the appropriate syntactic structure of the target language according to its context.

... “The next step entails, supporting theoretically the study, a stage that some scholars designate to the formulation of the theoretical framework. It implies analyzing and presenting theories, theoretical approaches, researches, and background information that may be considered relevant for the precise limitation of our research. That is to say, in this stage we should describe the level of information that there is about our problem research, explaining what has been done about it until now, for a posterior idea supporting what we will do based on the described knowledge condition” (Gomez, 2009, pp. 49-50).

The theoretical framework formulated in the following paragraphs aims to find theories which are able to become support for memory translation development and machine translation software. Translation technology is a field that is not yet widely explored in our country, almost ten years of research in the translation field of TICs in traductology. The growing translation market makes the use of translation software more and more relevant.

Since the 1990s, the inclusion of technological components in the training of translators has been a need pointed out by translation professionals and academics. In this context, a transversal exploratory study was proposed, whose objective was to investigate the inclusion of computer science applied to translation in the translation careers offered by public universities in Argentina, in specific technology subjects, and in other curricular and extracurricular spaces. Based on the information contained in documentary sources gathered by the research project (Bianchini, 2018, p. 11-12).

In recent years, the need for translation has been increasing. Universities have their pensums or study programs uploaded on web pages and these are translated. The translation can also be developed according to the country of destination. So it is necessary that, in the case of using SISTRACEN, these aspects are taken into account.

2.3 METHODS AND TRANSLATION TECHNIQUES

The translation process is considered as completed when the meaning gets to the target language. Consequently, people usually do not realize the procedures carried out in coding and decoding the text. A translator not only translate the text itself but also some other external factors like the culture, the background, and other personal competences.

Of these, only the first two are usually providers of a sustained and stable employment; on the contrary, the last offers freelance alternatives. In fact, I think I am working with readers have a university level of understanding and reading in relation to foreign language and, of course, you have a special interest for the main translation areas: a) science and technology; b) economic, social and politic affairs; and c) philosophic and literature works (Newmark, 1995).

Translation as a discipline of computational linguistics. To summarize, the literal and literal modulated translation is applied to two or three words do not require other translation methods. The university students who belong to the different areas have different curricula with subjects by area of knowledge.

These subjects literally translated concerns to university study programs, which can be different depending on specialty, career program or study area.

2.3.1 Word-for-word Translation

It is an interlinear translation that consists of putting the target language words under the source language words, so phrase order is kept in this translation and words are translated one by one according to meaning and syntax. The context and the cultural words are translated literally. Word by word's translation goal is to understand the source language system and to analyze a text. The first step to a forward translation this described by Newmark (1987).

Word for word translation or literal translation is the rendering of text from one language to another one word at a time with or without conveying the sense of the original text. In translation studies, literal translation is often associated with scientific, technical, technological or legal texts (Grassilli, 2015, pp. 42-43).

Word by word translation is useful, as Grassilli (2015) and Newmark (1987) mentioned, because this translation method keeps the syntax of phrases. Nevertheless, the understanding must be clearly translated, and it is also necessary to analyze the text.

2.3.2 Literal Translation

“Also called direct translation which is found in everyday usage, literal translation means to render the text from one form of the first language to another” (Postam, 2016).

According to Newmark (1987), literal translation is the process of transforming source language grammatical constructions into their closest equivalents in the target language. Conversely, the lexical words are translated one by one according to their meaning and also out of context. As a process of pre-translation this method identifies the problem in a text this type of translation mainly used in this project.

2.3.3 Faithful Translation

The definition of truthfulness and the ways in which translators have striven to achieve it have varied over the centuries... “faithfulness” depends on how you define it – a principle of loyalty or honesty or a matter of exactness and accuracy; or both; or much more than that) – and also it

depends on what you relate it to – word or meaning ; the source language or the target language ; the source text or the target text ; the author or the reader. (TSADRA, 2021)

As it says in TSADRA (2021), translators have been always concerned about faithfulness and to achieve that, they have used different methods. One of them is the faithful translation, which as its name suggests intends to reproduce the exact contextual meaning to established target language grammatical structures. Cultural words are transferred to grammatical and lexical levels, and are kept in the original translation. This method intends to be faithful to the original language writer's intention.

In the typology of types of texts explained later, this translation is for expressive texts, the translator will try to reproduce the original idea through the grammatical structure. The translational loyalty will be of great importance for its development, and according to Newmark (1987).

2.3.4 Semantic Translation

The only difference between semantic translation and faithful translation is that the last one gives importance to the esthetic value. That is the natural and beautiful sound of the original language text. In other words, this method must contemporize, where to be necessary, with meaning. In the way, that assonance, or words handles, or repetition does not produce an awful effect in the final version.

According to Newmark's (1987) definition, the process of semantic translation allows to search words quickly and to translate word by word. Therefore, semantic translation is a method that also can work with computer-assisted translation (CAT), which requires memories associated with equivalent meanings in the target language. In these regard, semantic translation is:

...the process of using semantic information to aid in the translation of data in one representation or data model to another representation or data model. Semantic translation takes advantage of semantics that associate meaning with individual data elements in one dictionary to create an equivalent meaning in a second system. An example of semantic translation is the conversion of XML data from one data model to a second data model using

formal ontologies for each system such as the Web Ontology Language (OWL). This is frequently required by intelligent agents that wish to perform searches on remote computer systems that use different data models to store their data elements. The process of allowing a single user to search multiple systems with a single search request is also known as federated search. Semantic translation should be differentiated from data mapping tools that do simple one-to-one translation of data from one system to another without actually associating meaning with each data element. Semantic translation requires that data elements in the source and destination systems have "semantic mappings" to a central registry or registries of data elements. The simplest mapping is of course where there is equivalence (DEFINITIONS, s.f.).

2.3.5 Adaptation

An adaptation, also known as a free translation, is a translation procedure whereby the translator replaces a social or cultural reality in the source text with a corresponding reality in the target text. This new reality would be more usual to the audience of the target text. The adaptation is used when translating poetry, works of theatre, and advertising.

The superficial meaning of the words. It is very important to extract what the words mean in a particular situation according to the cultural context. Considering the cultural element helps us understand that the translator is not the only person involved in the translation process. Eugene Nida has noted that "language is a part of culture, and in fact, it is the most complex set of habits that any culture exhibits. Language reflects the culture, provides access to the culture, and in many respects constitutes a model of the culture" (Grassilli, 2015, pp. 44-47).

This translation method was not applied in this project, as it implies pragmatics that allows us to understand the text translated. The pragmatic part of the text involves giving meaning to a poetic or artistic text, as the subjects are nominal phrases or two or three-word phrases, a modulated translation is not applied, but rather a literal translation. Grassilli (2015) mentioned that language and culture go hand in hand, through the translation of cultural aspects reflected the language access to culture.

2.3.6 Free Translation

Richard, Platt, and Weber (1985) stated: “A free translation is a translation that reproduces the general meaning of the original text. It may or may not closely follow the form or organization of the original” (p. 299).

Free Translation, also called intralingual translation, reproduces the original content without the form. Translation according to Newmark (1987), seeking to reproduce the original idea. It uses more paraphrasing than other methods, and that is why this method is usually a set of paraphrases much longer than the original.

In other words, free translation seeks equivalence despite not following the original form of the text, allowing the translator to put aside the script and follow their line without departing from what the text says.

2.3.7 Idiomatic Translation

The requirements of the market have led us to constantly develop and improve the services we make available. From the very outset, the main objective of Idiomatic Language Services has been to provide services of the highest quality at the most competitive prices, guaranteeing speed of delivery and the utmost confidentiality (Idiomatic Language Service, s.f.).

This method reproduces the “message” from the original. It tends to vary the meaning, giving importance to colloquialism and monism, even if they are not present in the original.

2.3.8 Communicative Translation

Translation has been present in language teaching in one way or another since time immemorial. Before the learning of modern languages became a trend (or, more exactly, a necessity) with the beginning of the industrial revolution and increasing mobility, classical

languages, as well as living languages, were mainly taught through Translation. (Newmark, 1987, p.9)

Communicative translation refers to reproducing the exact meaning and making it understandable alluding to the original meaning, focusing on the text and making the most accurate reproduction possible for the readers. Communicative translation tries to reproduce the exact contextual meaning from the original. In this way, both content and language be easily acceptable and comprehensible for readers (Ayvazyan, 2017).

2.4 Technical Translation

The technical translation, according to Newmark (1987), is based on a typology of texts theory pointed out that academic documents, legal documents, and reports, so this kinds of documents require a technical translation. In this case, based on the discipline they belong to, the translation could be free or modulated. These texts do not have a pragmatic load, so they can have a more literal translation or do not require modulation. The technical translation refers to more formal terms that do not have an expressive charge.

2.4.1 Concept Technical Translation

Technical translation has to do with a formal translation that may involve a literal translation; in typology of texts: academic documents and legal documents. This translation mostly implies repeated patterns as they are legal documents issued by certain authorities or have similar content. Translation of technical and scientific documents, where accuracy is important, involve translators with solid backgrounds in technology.

Scientific and technical knowledge has always been a prized commodity throughout history and the communication of this information through translation has played a tremendous role in development of human civilizations and the advance of science and technology. Its importance is without doubt growing particularly in light of what is commonly referred to as the 'information age' in which we find ourselves” (Byrne, 2009, p. 2).

There are 3 prerequisites for a qualitative Technical Translation:

Apply linguistic knowledge and aesthetic knowledge to technical knowledge only then Technical Translation comes to life. Therefore the technical translator must assume the role of technical editor by creating the needed meaning and not just translating the original information (TRANSLATION FACTORY, 2021, pp. 1-3).

2.4 TYPOLOGY OF DOCUMENTS

The documents refer to all the types of files, documents, papers, books, reports, records, letters, etc. Documents of an academic or legal area are documents submitted by an authority or that have a legal value. They can be academic history, grades transcript. The list is never-ending.

2.4.1 Legal Documents

Documents of an academic or legal area are documents submitted by an authority or that have a legal value. They can be academic history, grades transcript. The list is never-ending.

Legal document. Means any written instrument whether on paper or in electronic form including, without limiting the foregoing any contract, agreement, mutual aid agreement, protocol, purchase order, memorandum, letter of intent, application, release, waiver or acknowledgment which, when executed, will have or is intended to have the effect of causing the Board to be bound in a legally enforceable relationship with any other person, entity, organization but shall not include (LAW INSIDER, 2021, pp. 2).

Legal documents have legal value by proving identity, study, and aspects related to law. These documents require literal or modulated technical translation. Legal documents have repeated patterns, so the translator will translate only the fields' changeable data or information in each legal document.

2.4.2 Academic Documents

A grade transcript is documentation of a student's academic record, which usually means all courses taken, all grades received, all honors received, and degrees conferred to a student. An academic certificate is a document that certifies that a person has received a specific education. In many other countries, certificates are qualifications in higher education. These have the titles Certificate, Graduate Certificate and Graduate Certificate. The certificate is below the standard of the associate's degree and the higher diploma, which are below the bachelor's degree (DEFINITIONS, 2021).

2.4.3 Other Type of Documents

The documents refer to a wide range of writing in different types and forms. And with different themes, documents today are not limited to physical or paper documents. There are also electronic or digital documents. Therefore, it is complex to define the documents and their types.

An original or official paper relied upon as the basis, proof, or support of anything else, including any writing, book, or other instrument conveying information pertinent to such proof or support. Any material substance on which the thoughts of men are represented by any species of conventional mark or symbol (DEFINITIONS, 2021, p. 10).

2.4.4 ISO -17100:2015 Translation Standard Quality

ISOs are compliance standards related to quality and compliance with norms to verify the quality of a product or service. According to the webpage ISO 17100: 2015, it provides requirements for the core processes, resources and other aspects necessary for the delivery of a quality translation service. The application of ISO 17100: 2015 also provides the means by which a translation service provider (TSP) can demonstrate the compliance of translation services. The use of raw results from machine translation plus post-editing is outside the scope of it. ISO 17100: 2015 does not apply to interpretation services (ISO, 2021, pp. 1-4).

2.5 Literal Translation

2.5.1 What is Literal Translation?

Newmark (1987) emphasizes that, although the literal translation cannot be improved, it is possible to make improvements according to the translator. It also indicates that it is convenient to distinguish the literal translation from the word-for-word translation. The central idea that the author points out is the idea of converting from one language to another, from one word to another, even from one sentence to another sentence.

Considering Hilma (2011), a word for word translation follows closely the source language is called a literal translation.

A literal translation is useful if the source text as in an interlinear translation, but a literal translation does not communicate the meaning of the source text. The goal of a translator should be to produce a translation that has the same meaning as the source language but is expressed in the natural form of the receptor language.

The sentences to be translated into academic documents can be short sentences or singular words, which makes the ideal translation performed literally. The reproduction of the target text must follow the syntax rules for the most part to respect the transposition of texts and the order of translation of the words. Larson also points out that it is the most natural way to reproduce a target text (Bell, 1991).

2.5.2 For what is used Literal Translation?

The sentences to be translated into academic documents can be short sentences or singular words, which makes the ideal translation performed literally. The reproduction of the target text must follow the syntax rules for the most part to respect the transposition of texts and the order of translation of the words. Larson also points out that it is the most natural way to reproduce a target text (Hilma, 2011, p. 47).

2.5.3 How it will work?

Literal translation (word-for-word translation) means the translation aims to be as close as possible to the original source language when translating into the target language. This approach is often in contrast to semantic or free translation. This is often demonstrated as interlinear translation, with the target language immediately. The source language word order is preserved and the words translated singly by their most common meanings, out of context. Cultural words are translated literally (Hurtado Albir, 2009).

2.6 TEXT TYPOLOGY

According to Peter Newmark (1987) in his book “A textbook of Translation”, the text types are the following, and each of them deals with a language function.

a) Expressive text type

In this type of translation would fit texts such as lyric poetry, short stories, novels and plays. The translation of the same requires much more than adequate proficiency in the language; it requires knowledge in literature and art.

b) Informative Text

The characteristic of expressive text-type is serious imaginative literature like scientific, textbook, notices. Also authoritative statement, as commercial paper and autobiography that can be from an article, publicity and others. Finally, personal correspondence to name some: economic, memorandum, popular fiction and others.

c) Vocative Text type

The types of texts are mainly ads, instructions, publicity, thesis and others. According to Reiss (1971-1976) from content, form and appeal, and Nida (1975) to determine how to interpret a text: expressive or informative and imperative. Halliday and Hasan (1976) languages serves for the expression of the speaker’s experience of the real world, including the inner world of his own consciousness.

2.7 TIC's in translation

Ana Guerberof (2011) stated that the translation memory concerns:

New technologies lead to the creation of new translation processes in the localization industry. In the past, translation involved entire software, documentation, and help materials into new target texts for the local markets. Translation memories (TM) were created and were recycled in different but rather similar projects. Productivity increased prices of translations decreased. (p.1)

Since the 1980s, machine translation (MT) technology has improved significantly and has been incorporated into the localization workflow as another translation type aid, rather than a fully automatic high-quality translation. It remains what effect this technological development will have on pricing structures.

Nowadays, Translation Memories are a key feature of most software used by translators. These programmes allow the storage of source texts aligned with their translations to reuse them in the future. A key concept of TMs is segmentation... (Martín-Mor 2011, p. 5)

For this purpose, TM is necessary to reduce the length of time in the translation process, helps to reduce the cost, and add efficiency and effectiveness. Consequently, the task of the translator is made easy; for instance, the results of the document translation in less time. Moreover, the authors mention that CAT these days is a necessity. They do not deny that these technologies require new investment, not only in purchasing tools but also in learning how to use them.

2.8 CAT (Computer Assisted Translation)

The use of technology requires interdisciplinary understanding in translation and the creation of translation memories for UMSA, since translation is a cross-discipline for other areas of knowledge. The use of computers and human development is a part of the development of technologies. Translators, both students who will become translators and translators currently working at CETI must be prepared in the use of technological tools to improve their job opportunities (Sainz-Aja, 2015).

Computer-assisted translation (CAT) is a process of information transmission that, like textual translation, is both interdisciplinary and unifying. Interdisciplinary because it involves the handling of different areas of knowledge as well as the consideration between professionals belonging to those areas and unifying because at the same time it advocates the communion between different cultures and communities around two common elements; the common language and the common language different cultures and communities around two common elements: language and knowledge.” (Lefreve, 1992, pp. 10-12, as cited in Figueroa, 2014, p. 17)

The computer-assisted translation carried out in this degree project, being similar to previous proposals, seeks to continue the constant innovation.

It differs from the previous ones at the same time as it is a translation and validation of more than three thousand terms, which makes the contribution different from the previous works with certain similarity in the proposal.

The translation of the present project degree work covers two areas of knowledge. The first is the work between different people at CETI (professionals, students, academics, translators, authors, editors). The second is the use of the new technologies that provides a tool to the translators. In that sense, the concept of literal or interpretative translation matches the methodology of a unified and interdisciplinary work (Figueroa, 2014).

Computer –aided translation (CAT) is a form of human translation but performed by a Computer supported by specialized software. The technology assists a translator in a translation tasks by providing translation for phrases or sentences that they have translated before- thereby increasing productively. In fact, a CAT tool is one of the most important tools in a translator's arsenal. However, the development stage of the translation will require the future work to be automated and the translator will spend less time on document design, which used to take up more time than translation (LIONBRIDGE.COM, 2017).

2.9 Translation Memories

The translation memory became popular with the idea of Martin Kay in 1980 decade. He proposed a draft of translation tools at the moment. He does not mention specifically the term translation memories (Somers, 2003). His idea was that translators avoided

translating the same documents all the time. Once kept in a memory, the translators could use it automatically from the computer (Sainz-Aja, 2015).

Every instance of interlinguistic human translation constitutes a triple event, since it involves the simultaneous execution of an act of communication, a textual operation and a mental process. In spite of their inevitable concurrence, each of these aspects can be scientifically approached separately (Hurtado Albir, 2001, p. 15).

The translation memory is a tool for the translator. He can save some terms belonging to a specific area or a specific situation and used whenever he needs.

Some texts have specific layout, so it can be useful to create a program with the idea to complete the document only with certain information, like personal data or others that are referred to the text (Sainz-Aja, 2015).

Translation processes of an automatic nature and a translation memory. As we have seen, in the first case, text translations are created automatically from segments into which the text is divided. But these segments are not stored and therefore will not appear as suggestions for translation of a similar segment in the future. Translation memories, on the other hand, retrieve previous translations and store them in memory. Therefore, certain translations do not need to be repeated (Figuroa 2014, p. 31).

Methodologically, the purpose of this project is to translate the text using a data base and to demonstrate the interdisciplinary characteristics of the translation. Figuroa, (2014) for this reason, it is necessary to apply the knowledge according to translation memory management in the data base. This tool represents an advanced in the use of CAT in terms of efficacy and effectiveness.

The development of translation has to consider that the terms used sometimes, the BSI (Britannic Standardization Institution) which has that challenged to standardize some words. But other words are changing by the technology (Newmark, 1987).

The translation memory is a tool for the translator. He can save some terms belonging to a specific area or a specific situation and used whenever he needs. Some texts have specific layout so it can be useful to create a program with the idea to complete the

document only with certain information like personal data or others that are referred to the text (Sainz-Aja, 2015).

2.10 TERM VALIDATION

For the validation of terms, web pages with certification in different fields and disciplines had been used. Their reliability comes from the number of users who visit these pages daily to perform from quick translations to translations of complex documents. IATE comes from the European Union, Linguee is the most well-known website and Proz is a website with translation memories that show the different disciplines in translation.

2.10.1 IATE

From IATE official web page (2020):

One of the most striking achievements of inter- institutional cooperation was the launch by the Translation Centre of the IATE (interactive terminology for Europe) project in 1999. With over 8 million terms covering the 24 official languages of the EU, IATE is the largest terminology database in the world today: in 2016, its public version received 36 million queries and its internal version (accessible only to EU staff) received 18 million queries.

This type of CAT technology tool has been available since 2007. One remarkable aspect is that many EU projects have emerged from it. This permitted to bring together terminology resources from all possible areas of knowledge, for use in translation, and, at the same time, managing the technical aspects of English being the most outstanding institutions of the European Union. (NETWORK, 1994)

GRAPHIC 4: IATE validation source 1



Source: <https://iate.europa.eu/home>

2.11.2 LINGUEE

In the same way, Linguee (2020) is a web service providing a free multilingual translation with specialized translation. Unlike other services, Linguee is a searcher which gives access to large numbers of similar sentence pairs from online documents. Linguee web indexers are specialized in searching parallel sentences. The paired sentences have an automatic quality evaluation by an automatic learning that estimates the quality of the translation. Other option for the validation is manual translation, so the automatic learning system is continuously trained.

A few years ago, back in 2009, when Linguee was coming to stay, most people were a little skeptical at first. It's just that when this website started, almost anyone could make changes to its results, which, on the other hand, came from not very reliable sources (Linguee, 2020).

Linguee webpage seeks to improve the service with updates, as with a huge amount of bilingual texts from reliable sources, such as the EU (European Union), and other international organizations. Therefore, in just a few years, the source of consultation became a simplified access to hundreds of consultations and today is more faithful.

Thanks to this, according to its official sources in Spanish, Linguee went from 34 million visits in 2009 to 1625 million visits in 2014, with a total of 4 billion visits since its launch. In addition, they have a team of more than 400 professional editors who collaborate with the dictionaries and results that most of us use daily (Linguee, 2020).

Text translation modulation in context is always necessary for translators, the post edition is recommended, but the findings as they are in context are very useful for people in general.

Every time the translator looks for a new term, just by putting the first letters of the word, the page will offer him results, but as it is seen in the graphic 4, extracted by

screenshot from the official Linguee website, now it does it with much more precision (Santilli, 2015).

“Linguee's system is used for more than 200 million searches per month, a figure that promises to skyrocket with the arrival of the application for Android, the world's most popular mobile platform” (Linguee, 2020).

Linguee's bilingual dictionary is already working on mobile devices, offering translations from English into Spanish, examples of word usage and syntax (INFOBAE, 2020).

GRAPHIC 5. *The screenshot of linguee webpage 2 validation source*



Source: <https://www.linguee.es/>

2.11.3 Proz

Proz.com is a web word reference for freelance translators. It was created in 1999 and is used for translation jobs. Until October 20, 2018, this webpage reported over 960,000 registered users, covering over 200 countries and territories worldwide.

Wikipedia webpage, (2020) informs about this translator: “The site is available in over 45 languages and is being localized into 35 more languages, although localization is not complete for many languages, the default setting is English for all. Quant Cast reports

that ProZ.com has 220,000 unique visitors per month. The website is not restricted to professional translators only, hosting semi-professionals and amateurs”.

GRAPHIC 6. *Proz the third term validator, also with specialized fields.*

ProZ.com
Terminology Jobs & directories Member activities Education Tools

ProZ.com term search — search translation glossaries and dictionaries

Search ProZ.com's extensive translation dictionaries and glossaries for medical, legal, technical and other specialized terms in Spanish, Italian, German, Chinese, Arabic and many other languages.

If you don't find the term you seek, feel free to ask for translation help using [KudoZ™](#).

[Go back to the old term search](#)

Search ProZ.com for a term or short phrase

[Term search help](#)

Any source language → Any target language

Also search reverse language pair

Exact match Match entire phrase
 Match whole words only Fuzzy diacritics
 Separate results by resource Highlight matches in results Open links in a new window

Search Results: 25

Source: <https://www.proz.com>

2.11.4 Terminological Variation

Correlational and predictive indicators on the relationship between linguistic distributions and the quality of writing have been somewhat inconclusive (Jarvis et al., 2003). It is clear that contextual and disciplinary differences, including the roles of topics and prompts, contribute to variations of terms in academic texts. (Beers & Nagy, 2009) (Hardy Jack, 2013, p).

A substantial number of studies have identified linguistic features (e.g., subordination, prepositions, and linking adverbials) that are predictive of quality scores given by instructors/raters, and those that distinguish differences between disciplines and undergraduate proficiency levels. The identification of linguistic features that are found according to the different disciplines are morphology, semantic and syntax. (Grant and Ginther, 2000)

CHAPTER III

PROPOSITIVE SECTION

The main purpose of this section is to display an overview of the limits of this work. Since the main focus within this paper was the traductology concerning SISTRACEN, the reached general objective was an automated translation software. Considering the algorithm of Roger T. Bell, this is qualitative research. It pretends to cover the data, the creation, and the evaluation of this project.

3.1 Methodology

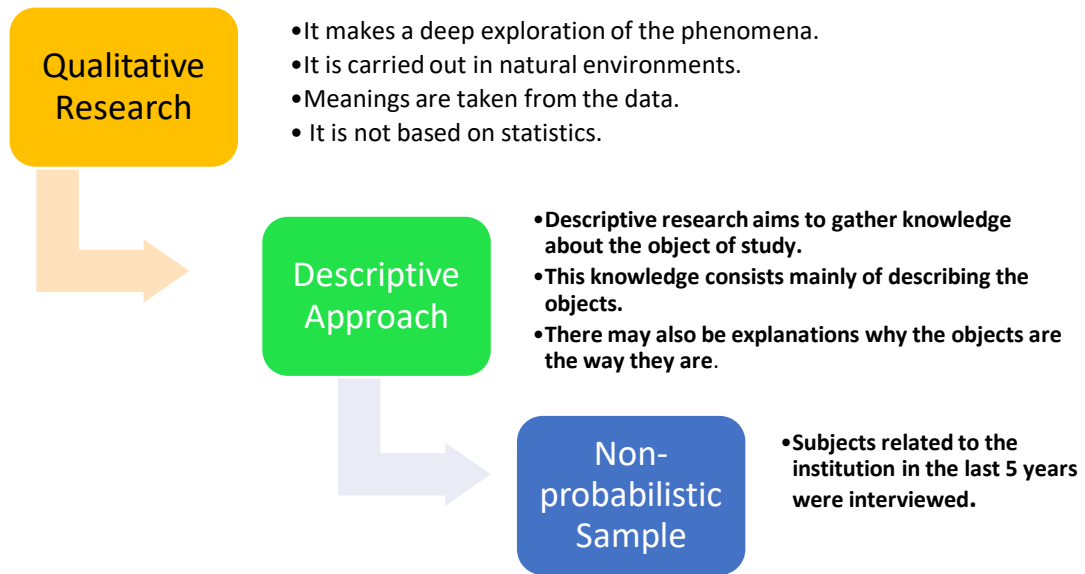
This degree project has included literature revisions regarding methods, techniques and all the methodological aspects in consideration to the development of the project proposal for SISTRACEN (Sistema de Traducción de Certificados de Notas), as well as the Translation Memory for the implementation of CAT.

It can be applied in most research situations, and to population reduced to translators who have worked at CETI. This means, to evaluate the reaction of SISTRACEN as a solution to the problem of efficiency and effectiveness in the translation of grades transcripts.

Research paradigms (Jurgen Habermas, 2000; in Vargas, 2011: 14)

To point out that the data collection method applied is qualitative, with the use of translation webpages, a descriptive design with a non-probabilistic sampling was used. The first individual was chosen at random and the rest are conditioned by it. In consecutive non probabilistic sampling, the researcher chooses a single individual or a sample group, conducts an investigation over a period of time, analyzes the results, and then moves on to another subject or group of subjects (if necessary).

TABLE 3: QUALITATIVE RESEARCH



Source: Own creation.

3.1.1 Epistemological Foundations

Part of the relevance of new technologies in translation will be reflected in the scope of this work. The creation of a translation memory may be at the service of CETI. This will enable the development of more translation memory terminology tools for CAT translation assistance.

CETI center has been developed with the purpose of providing the service of certified translation of texts for the population of students and private individuals that require this service. Currently, there are no CAT tools, but translation work of academic documents and official translations of documents are carried out.

Figuerola, (2014) points out it is necessary to know the creation skills regarding the handling of a translation memory in the database. For that reason, these tools represent an advance in efficiency and effectiveness in the CAT translation process for any type of documents.

3.1.2 Research Method

As part of the methodology, it has been decided to opt for ethnography in translation within CETI institution, in order to gather information on the technological development that translators currently have regarding tools CAT, regardless of the text they have to translate.

Automatic translation with post-editing has once again aroused interest in recent years, since many assisted translation systems integrate an automatic translation engine into their translation environment. (Figuroa, 2010) To include another area in which research has not been done, concepts on machine translation with post-editing have been added, to compare the opinions and perceptions of both techniques.

Hutchins & Somers (1995) emphasize the difference between two terms: “In the CAT process, I will begin by making a distinction between computer-assisted human translation (MAHT) and automatic translation with human participation.” (p.24)

In accord with the information mentioned above, the translator is ultimately responsible for the translation, which uses computer tools such as spell checkers, grammar checkers, style checkers, online reference books (dictionaries, thesauruses, encyclopedias, etc.) and online bilingual dictionaries, among others. On the other hand, in the case of SISTRACEN, the program itself is primarily responsible for translation, but not for post-editing. Here, human assistance intervenes in the process; only when necessary. Examples of this intervention arise when, for instance, the program asks for help in interpreting structures not inserted in the translation memory, resolving ambiguities or syntactic issues, and selecting lexical terms not inserted. This deals with the fact of giving a solution to the problem of Center of Teaching and Translation of Languages CETI. (Hernández Sampieri, 2010)

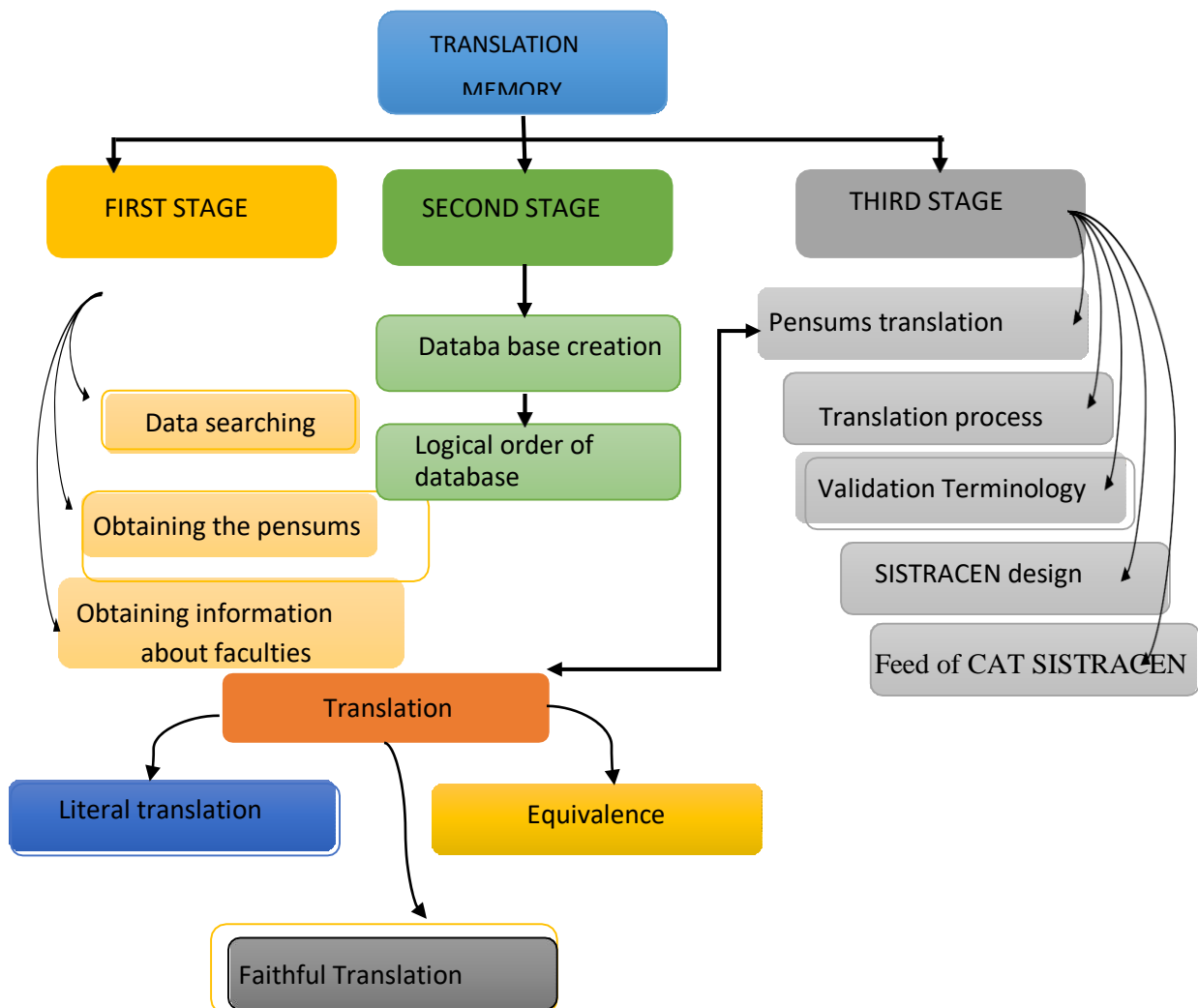
3.2 Project Proposal Development

This part presents a detailed description of the creation process of a translation memory inserted in the database of careers at UMSA. The conclusion of translation memory feeding and SISTRACEN evaluation will also be explained in this section.

For the creation of a TM, Castiau, Halato and Quintana (2011) the implementation of a parallel terminology through the use of the translation program used was established. In the case of this work, it is referred to a database. The alignment of the collected sentences consists of the segmentation of the original texts and the translated texts, and then the insertion of terminology of the study programs of UMSA university careers.

A translation memory (TM), as Gerasimov (2001) points out, means that the translator will never have to translate the same phrase or sentence twice, since when he encounters the same word, phrase, or sentence in the process of computer-assisted translation (TAC), the program suggests that you use the translation previously made in the local computer program, which can be edited according to the new document, so that in this way you do not lose the essence in the construction of the text. This procedure of reusing information is very common in several areas of knowledge. Stored information is a remarkable help in the translation of texts and to translators that the translator could come to repeat in his daily life, such as academic documents. Working with MT allows the efficiency and effectiveness of translations with the use of technology. (Figuroa, 2014).

GRAPHIC 7: TRANSLATION MEMORY PROCESS



3.2.1 First Stage- Compilation data and Translation

The initial idea was to use the complementarity between technology and translation. After further examination and since as the proposal was not very clear, it was decided to go to an expert translator in Linguistics, who worked on with technology. This helped with the specificity of ideas, and here is the idea of the present degree project was clarified. Then, the following step on the procedure was to prepare the proposal document.

Significantly, the data collection followed these dynamics. First, it was determined which academic document needed to be translated and mostly, among the enrollment, academic record, academic history and transcript of records.

The next step was the collection of the study programs of the fifty-four careers; some careers have several specialties. Third, the careers were arranged according to the organization of the semester or yearly time. Finally, a database of terms was organized, giving a total of three thousand five hundred subjects to be translated.

GRAPHIC: Steps on translation for SISTRACEN



The translation process started by consulting careers, study programs making semester and years lists. Likewise, the translation process began by making a literal translation of all the subjects, starting with the architecture faculty and concluding with the technology faculty. The subjects for translation had a high variability in subjects such as calculus, computer science and language. These words can be translated according to the different areas of study. This aspect has been corrected in the next stage of the project.

On this basis, a complex program could be developed, but it is not the scope of linguistics. Furthermore, it is a large project, given that the development of a translation algorithm takes a lot of time and money. The scope was a web page, but the budget shortcomings directed the project to the idea of using a web domain. The transcripts template for text recognition and subsequent data tabulation employ a list of terms, then post-editing and use the translation memory were to be created.

The project can improve the development of translation. That is why OCR is used to facilitate the translation of documents. Translators take more time designing than translating the documents. The procedure to follow was initially thought to start with transcripts, but it can be used for other types of documents.

The use of a diagram to insert the document and its template, this will direct us to the database, and the reliability of the database is acceptable given the 3 reliable sources that were cited for each term. On the other hand, when creating the translation memory, the most reliable sources were sought (IATE, Linguee and Proz). After the automatic translation, the translation memory database will be used to perform the revision (or it can be copied and pasted since the specific data has been translated), or simply for post-editing.

FIRST STAGE PROCESS:

A) STEP PROCESS

GRAPHIC 10: Analysis of academic document

DOCUMENT	FREQUENCY	KIND OF REQUIREMENT
Tuition	Yearly	Not necessary just inside the faculty
Transcripts	Yearly or by semester	Necessary for scholarship and work in some companies
Academic history and record grades history	Yearly	Necessary for scholarships

Source: Own Elaboration

TABLE 4: TRANSLATION FROM ENGLISH -SPANISH

Nº	TYPE OF DOCUMENT	LANGUAGE	PAGES – WORDS
1.	College Tuition (Matricula Universitaria)	English - Spanish	1
2.	Grades Transcript (Certificado De Notas)	English - Spanish	1-2
3.	Academic Records (Record Académico)	English - Spanish	3-4
4.	Academic Background (Historial Académico)	English - Spanish	3-5
5.	Birth Certificate	English - Spanish	1

	(Certificado De Nacimiento)		
6.	Diploma UMSA (Título Universitario)	English - Spanish	1
7.	Academic Letters (Cartas Académicas)	English - Spanish	1-2

Source: Own Elaboration.

B) SECOND STEP PROCESS

After defining the document to prepare the translation memory, the transcripts search began for the document design and the words of the document to be translated. Translated words of the document layout transcripts, such as the data and the authorities, do not change. For that reason, it is necessary for transcripts words to have a general translation.

GRAPHIC 10: WORDS IN A TRANSCRIPT

Source: <https://sistrazen.megaboxinter.com/vistas/certificado.php>

C) THIRD STEP PROCESS

Subsequently, the calculation of total words from 54 UMSA careers estimate the time on translation. The number of faculties, subjects, and specialties per career on the study program was determined to show a total of more than three thousand subjects to translate.

TABLE 5: NUMBER OF THE SUBJECTS FOR EACH CAREER

Nº	CAREERS	Nº OF SUBJECTS	BIANNUAL/ ANNUAL	ESPECIALITIES
1.	Agronomy Engineering Degree	155	Biannual	6
2.	Agricultural Production and Marketing Engineering	49	Biannual	4
3.	Veterinary Medicine and	53	Biannual	-

	Zootechnics Program			
4.	Architecture Degree	33	Annual	-
5.	Plastic Arts Degree	35	Annual	-
6.	Graphic Design Degree	32	Annual	-
7.	Business Administration Degree	57	Biannual	-
8.	Public Accounting Degree	44	Biannual	-
9.	Economics Degree	70	Biannual	4
10.	Biochemistry Degree	46	Biannual	4
11.	Pharmaceutical Chemistry Degree	33	Annual	-
12.	Degree in Geographic Engineering	48	Biannual	-
13.	Engineering Geology Degree	48	Biannual	-
14.	Biology Degree	76	Biannual	4
15.	Chemical Sciences Degree	58	Biannual	-
16.	Degree in Statistics	89	Biannual	10
17.	Degree in Physics	187	Biannual-modular	7
18.	Computer Science Career	90	Biannual	2
19.	Mathematics Degree	31	Biannual	-
20.	Anthropology and Archaeology Degree	49	Biannual	-
21.	Degree in Social Communication Sciences	46	Annual	-
22.	Degree in Sociology	55	Biannual	-
23.	Social Work Degree	30	Annual	-
24.	Career In Law	80	Annual	3
25.	Ciencias Políticas y Gestión Pública	55	Biannual	-
26.	Library and Information Science Career	47	Annual	-
27.	Degree in Education Science	83	Biannual	4
28.	Philosophy degree	248	Biannual	6
				Elective Subjects
29.	History Degree	38	Annual	-
30.	Language and Linguistics Degree	107	Biannual	3
31.	Literature Degree	34	Annual	-
32.	Psychology Degree	57	Biannual	-
33.	Tourism Degree	53	Biannual	-
34.	Civil Engineering Career	74	Biannual	-
35.	Electronics Engineering Degree	52	Biannual	-
36.	Electrical Engineering Degree	52	Biannual	-
37.	Industrial Engineering Degree	48	Biannual	-
38.	Mechanical and Electromechanical	67	Biannual	1

	Engineering			
39.	Engineering Metallurgy and Materials Career	81	Biannual	2
40.	Petroleum Engineering Career	54	Biannual	-
41.	Career in Chemical Engineering	65	Biannual	6
42.	Medical Technology	81	Annual	3
43.	Medicine School	28	Annual	-
44.	Nursery Career	31	Annual	-
45.	Nutrition And Dietetics Career	37	Annual	-
46.	Dentistry	36	Annual	-
47.	Civil Construction Career	36	Annual	-
48.	Industrial Electricity Career	53	Biannual	-
49.	Electronics and Telecommunications Career	59	Biannual	-
50.	Electromechanics Degree	49	Biannual	-
51.	Car Mechanics Degree	57	Biannual	-
52.	Industrial Mechanics Degree	54	Biannual	-
53.	Industrial Chemistry Degree	53	Biannual	-
54.	Career In Geodesy	49	Biannual	-
TOTAL		3332		

Source: Own Elaboration.

C) FOURTH STEP OF THE PROCESS

The 3332 subjects from study programs were translated literally.

GRAPHIC 11: SAMPLE OF LITERAL TRANSLATION OF UMSA STUDY PROGRAMS

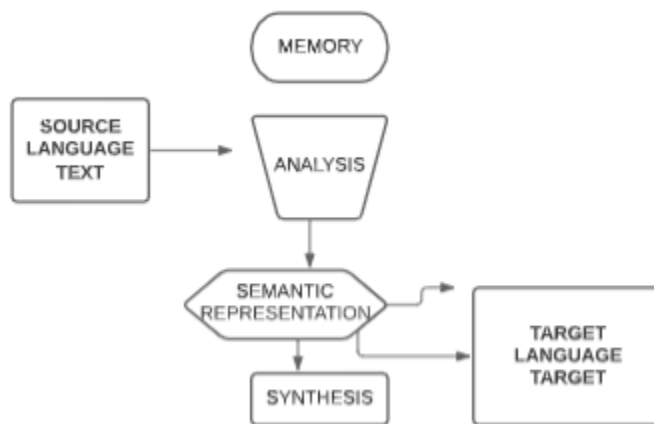
OCTAVO SEMESTRE	EIGHTH SEMESTER
<ul style="list-style-type: none"> • Diseño de Sistemas de Control 	- Control System Design
<ul style="list-style-type: none"> • Laboratorio de Sistemas de Control 	- Control Systems Laboratory
<ul style="list-style-type: none"> • Trabajo de Titulación 	- Degree work
<ul style="list-style-type: none"> • Humanística II 	- Humanistics II
<ul style="list-style-type: none"> • Maquinaria de Elevación y Transporte 	- Lifting and Transport Machinery

Source: Own Elaboration

3.2.2 Second Stage - Validation

The stage of validation of terms had to do with the correction made by the tutor on certain terms. The most repeated subjects were calculus, computer science and language and communication. The validation started with consulting the Cambridge dictionary, and then, after consultation with the translators, three sources of reliable validation were suggested. This was carried out in order to avoid bias in this research work. After the validation, this stage was necessary, because each term was inserted in each source of consultation. The first source was the LINGUEE website, which offers real context texts for each discipline. The second source was IATE. This European Union source page has the words according to academic disciplines. The third source was PROZ, which helped to confirm the two previous sources. The work was divided according to words with high variability, several with low variability and words with no variability.

GRAPHIC 12: Translation process algorithm from Roger T. Bell



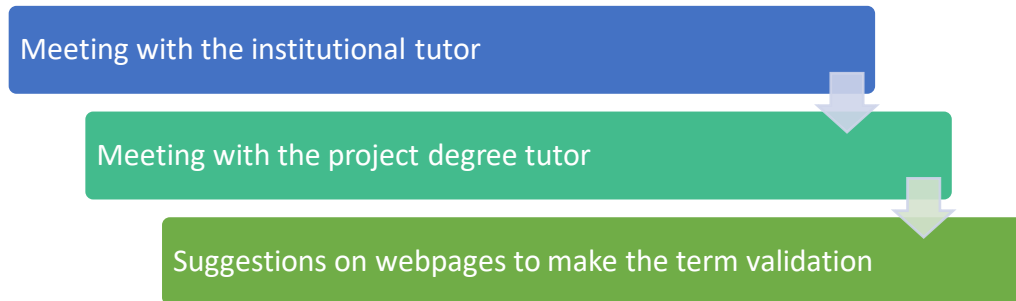
SOURCE: Translation and translating: theory and practice. (Bell, 1991)

Afterwards, implementing a machine translation project is easy if its scope and limitations clearly determined. An essential part of this project is information gathering, which should facilitate the amount of terms to be translated with active participation of the tutor, programmer, applicant and the schedule. When this perspective is achieved, the project can be carried out.

A) FIRST STEP ON SECOND STAGE

Expert error correction on literal translation and suggestions were used to validate the terminology:

GRAPHIC 14: DECISION ON VALIDATION THE TERMS



Source: Own Elaboration.

During the second stage, the variability of terms was identified and three levels of variability were determined when developing the database. High variability is represented with red color, medium variability with yellow color and low variability with light blue color.

B) SECOND STEP ON SECOND STAGE OF THE PROJECT

Compilation terminology on excel

TABLE 6: Compilation of 54 career terminology at UMSA.

Faculta	ORIGINAL TEX	TARGET TEXT
d		
F	Facultad de Agronomía	Faculty of Agronomy
C	Ingeniería Agronómica	Agricultural Engineering
C	Ingeniería en Producción y Comercialización Agropecuaria	Agricultural Production and Marketing Engineering
C	Programa Medicina Veterinaria y Zootecnia	Veterinary Medicine and Animal Husbandry Program

F	Facultad de Arquitectura, Artes, Diseño y Urbanismo	Faculty of Architecture, Arts, Design and Urbanism
C	Arquitectura	Architecture
C	Artes Plásticas	Plastic Arts
C	Diseño Grafico	Graphic Design
C	Programa de Artes Musicales	Musical Arts Program
F	Facultad de Ciencias Económicas y Financieras	Faculty of Economic and Financial Sciences
C	Administración de Empresas	Business Administration
C	Contaduría Publica	Public Accounting
C	Economía	Economy
F	Facultad de Ciencias Farmacéuticas y Bioquímicas	Faculty of Pharmaceutical and Biochemical Sciences
C	Bioquímica	Biochemistry
C	Química Farmacéutica	Pharmaceutical Chemistry
F	Facultad de Ciencias Geológicas	Faculty of Geological Sciences
C	Ingeniería Geográfica	Geographic Engineering
C	Ingeniería Geológica	Engineering Geology
F	Facultad de Ciencias Puras y Naturales	Faculty of Pure and Natural Sciences
C	Bilología	Biology
C	Ciencias Químicas	Chemical Sciences

C	Estadística	Statistics
C	Física	Physics
C	Informática	Computing
C	Matemáticas	Mathematics
F	Facultad de Ciencias Sociales	Faculty of Social Sciences
C	Antropología y Arqueología	Anthropology and Archaeology
C	Ciencias de la Comunicación Social	Social Communication Sciences
C	Sociología	Sociology
C	Trabajo Social	Social Work
F	Facultad de Derecho y Ciencias Políticas	Faculty of Law and Political Science
C	Derecho	Law
C	Ciencias Políticas y Gestión Publica	Political Science and Public Management
F	Facultad de Humanidades y Ciencias de la Educación	Faculty of Humanities and Educational Sciences
C	Bibliotecología y Ciencias de la Información	Library and Information Science
C	Ciencias de la Educación	Educational sciences
C	Filosofía	Philosophy

C	Historia	History
C	Lingüística e Idiomas	Linguistics and Languages
C	Literatura	Literature
C	Psicología	Psychology
C	Turismo	Tourism
F	Facultad de Ingeniería	Faculty of Engineering
C	Ingeniería Civil	Civil Engineering
C	Ingeniería Electrónica	Electronic Engineering
C	Ingeniería Eléctrica	Electrical Engineering
C	Ingeniería Industrial	Industrial Engineering
C	Ingeniería Mecánica y Electromecánica	Mechanical and Electromechanical Engineering
C	Ingeniería Metalúrgica y Materiales	Engineering Metallurgy and Materials
C	Ingeniería Petrolera	Petroleum Engineering
C	Ingeniería Química	Chemical Engineering
F	Facultad de Medicina, Enfermería, Nutrición y Tecnología Médica	School of Medicine, Nursing, Nutrition and Medical Technology
C	Medicina	Medicine
C	Enfermería	Nursing

C	Nutrición y Dietética	Nutrition and Dietetics
F	Tecnología Médica	Medical Technology
C	Facultad de Odontología	School of Dentistry
F	Odontología	Dentistry
C	Facultad de Tecnología	Faculty of Technology
C	Aeronáutica	Aeronautics
C	Construcciones Civiles	Civil Construction
C	Electricidad Industrial	Industrial Electricity
C	Electrónica y Telecomunicaciones	Electronics and Telecommunications
C	Electromecánica	Electromechanics
C	Mecánica Automotriz	Automotive Mechanics
C	Mecánica Industrial	Industrial Mechanics
C	Química Industrial	Industrial Chemistry
	Geodesia, Topografía y Geomática	Geodesy, Topography and Geomatics

Source: Own Elaboration.

C) THIRD STEP ON SECOND STAGE

After the meeting with the institutional tutor and the degree project tutor, both suggested using three sources of academic web pages were used by professional translators and, even by CETI translators. Term validation started one by one using IATE, Linguee, and Proz. Each inserted word in each web page showed the results by the study area, which allowed us to see which words had more or less variability.

GRAPHIC 15: Database terminology variation.

Facultad de Agronomía	Agronomy School	
Primer Semestre	First Semester	
Cálculo I	Calculus I/ Calculation I	
Química General e Inorgánica	General and Inorganic Chemistry	
Botánica General	General Botany	
Física General	General Physics	
Técnicas de Investigación y Redacción Técnica	Investigative Research and Writing Techniques	
Segundo Semestre	Second Semester	
Cálculo II	Calculus II	
Química Orgánica	Organic Chemistry	
Química Analítica	Analytical Chemistry	

Source: Own Elaboration.

GRAPHIC 16: Draft literal translation

36) Mechanical and Electromechanical Engineering

PRIMER SEMESTRE	FIRST SEMESTER
• Cálculo	Calculus

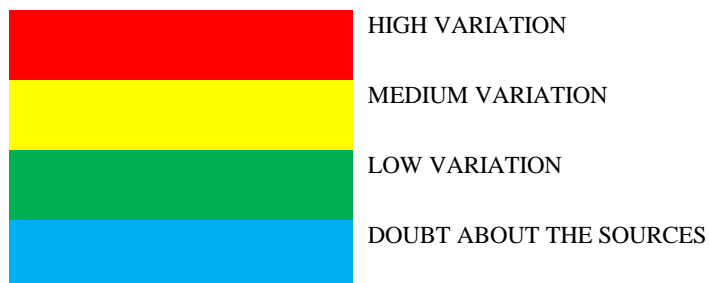
-Copy from the literal translation to EXCEL

Primer Año	First Year	
Taller de Proyectos I	Project Workshop I	
Teoría y Morfología I	Theory and Morphology I	
Representación y Expresión I	Representation and Expression I	
Introducción a la Historia de la Arquitectura	Introduction to the History of Architecture	
Teoría, Métodos y técnicas de Investigación	Theory, Methods and Research Techniques	
Edificaciones I	Buildings I	
Condiciones Ambientales en Arquitectura	Environmental Conditions in Architecture	
Razonamiento Matemático	Mathematical Reasoning	

-According to how many careers have the term, the variability is shown with colors:

Derecho	Career In Law	
PRIMER AÑO	FIRST YEAR	
Economía Política	Political Economy	
Introducción al Derecho	Introduction to Law	
Historia Jurídica y Política de Bolivia	Legal and Political History of Bolivia	
Sociología General	General Sociology	
Ciencia Política Teoría del Estado	Political Science	
Historia del Derecho y Derecho romano	History of Law and Roman Law	
Técnicas de investigación social I	Social Research Techniques I	
SEGUNDO AÑO	SECOND YEAR	
Derecho Económico y Empresarial	Economic and Business Law	
Derecho informático	Computer Law	
Sociología Jurídica	Legal Sociology	
Derecho Civil I: Personas y Derechos Reales	Civil Law I: People and Real Rights	
Derecho Municipal	Municipal Law	
Criminología	Criminology	
Derecho Constitucional	Constitutional Law	

CHART ON COLOR TERM VARIABILITY



D) FOURTH STEP ON SECOND STAGE

Compilation on webpages links directing to the term were included. The links redirect to IATE, LINGUEE AND PROZ in order to be able to see the variation of the term in relation to the area of study.

GRAPHIC 18: SAMPLE OF EXCEL DRAFT VERSION

Ciencias Políticas y Gestión Pública	Political Science and Public Management
Primer Semestre	First Semester
Introducción al Derecho	Introduction to Law
Economía General	General Economy
Contabilidad I	Accounting I
Matemáticas I	Mathematics I
Informática General	General Computing

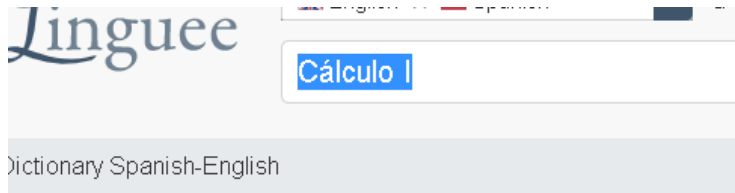
IATE for the word algebra in mechanical and electromechanical engineering:

<https://iate.europa.eu/search/standard/result/1596148046068/3>

GRAPHIC 19: TERMINOLOGY VALIDATION SAMPLE

1756920		
data processing [EDUCATION AND COMMUNICATIONS, information technology and data processing]		
information technology and data processing [EDUCATION AND COMMUNICATIONS]		
es	álgebra	★★★
en	algebra	★★★
1436610		
applied sciences [SCIENCE, natural and applied sciences]		
es	álgebra	★★★
en	algebra	★★★
No more exact results found with your settings. Similar results displayed below.		

Linguee for the word calculus in mechanical and electromechanical engineering:



cálculo *noun, masculine (plural: cálculos m)*

calculation *n (often used)*
 Hice un cálculo aproximado antes de resolver la ecuación. I did a rough calculation.

estimate *n (plural: estimates)*
 El experto hizo un cálculo preliminar del valor de la empresa. The expert estimated the company's value.

computation *n*
 El cálculo del impuesto a la renta debe tener en cuenta la nueva tarifa. The computation of the new tax rate.

computing *n*
 Los ingenieros realizan el cálculo de datos para misiones espaciales. Engineers perform data calculations for space missions.

estimation *n (plural: estimations)*
 El diseño se basó en los cálculos de la ingeniera. The design was based on the engineer's calculations.

measurement *n*
 El cálculo del consumo de agua se hace... The measurement of water consumption is done...

<https://www.linguee.com/english-spanish/search?source=auto&query=C%C3%A1lculo+I>

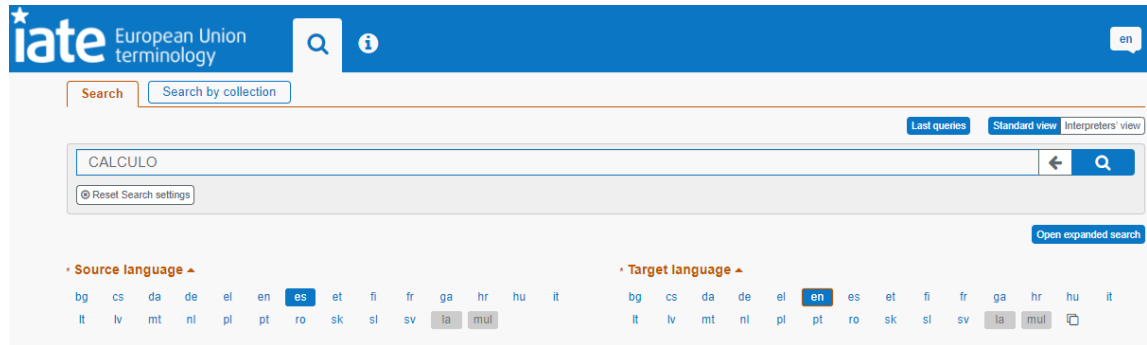
Proz for the word algebra in mechanical and electromechanical engineering:

<https://www.proz.com/search/>

Languages	Fields	Term → translation
Russian to English	> Education/Pedagogy > "Curriculum, primary school"	знания по алгебре → algebra
Dutch to English	> Mathematics & Statistics > "subject in Engineering curriculum"	letterrekenen → algebra
English to Spanish	Bus/Financial; Science > Economics	algebra → álgebra
English to Croatian	> General/Conversation/Greetings/Letters	algebra → algebra
English to Romanian	Science; Tech/Engineering > Mathematics & Statistics	algebra → algebra
English to German	Science; Tech/Engineering > Mathematics & Statistics	Algebra → Algebra
Romanian to English	> General/Conversation/Greetings/Letters	algebra → algebra
German to Hungarian	> General/Conversation/Greetings/Letters	Algebra (e) → algebra

The graph at the top shows the translation memory of the database inserted in SISTRACEN. In the left column and in the right column the translation was performed. Next to the translation, the web pages that direct us to the sources of each term and the colored columns represent the levels of terminological variability indicated with colors.

GRAPHIC 20: SAMPLE OF THE WORD WITH MOST VARIABILITY



WORDS	KIND OF VARIABILITY	SAMPLE OF AREA OF STUDY AND TRANSLATION
CALULO I	HIGH	-Computation: accounting
CALCULO II		-Calculus: environment and health
CALCULO III		-Calculation: exact sciences -Number crunching: information and engineering - Vector processing: data processing.

Languages	Fields	Term → translation	Poster answerer
⊕ Portuguese to German	Tech/Engineering > Engineering (general) > "Studium"	Cálculo → Analysis	Elisabeth Renger (X) A
⊕ Spanish to English	Bus/Finacial > Finance (general) > "Manual de empresa"	Cálculo → Cost Estimates	Manuel Cañedo patinb
⊕ Spanish to English	Law/Patents	cálculo → calculus	puddlepuck (X) swisste
⊕ Spanish to English	Science	cálculo → Calculation	Patricia Posadas pfeins
⊕ Spanish to Dutch	> Cinema, Film, TV, Drama > "making of an animation movie"	calculo → berekening/rekenklus/rekentijd	De Facto Ide Verhelst (
⊕ Spanish to English	Medical > Medical (general)	Cálculo → Calculus	Olga & Miguel Freelance
⊕ Spanish to English	<i>Not specified</i>	cálculo → calculus	Tushar Deep
⊕ Spanish to English	<i>Not specified</i>	cálculo → calculus	Tushar Deep
⊕ Spanish to English	<i>Not specified</i>	Cálculo → Calculus	clwilliamson

SOURCE: IATE web page, own elaboration and PROZ screenshots.

The projects that seek the creation or application of a system aim to develop the solution to the main shortcomings reflected on the basis of a needs analysis, in a process of joint development for the complementation of a product.

3.2.3 Third Stage- Evaluation for the possible implementation

The possibility of the implementation responds to the fact that SISTRACEN's translation function has been tested. About thirty transcripts from different areas have been translated to determine its functionality and to test if it could or could not be a tool for translators to use. The results were that SISTRACEN had little variability and could be implemented.

Taking into account the scope of this project, it is limited, but precise and very specific. For this reason, almost all the objectives have been completed and achieved in relation to the creation of a translation memory for the 54 study programs of the 54 careers at UMSA.

Thus, and just as it was proposed from the beginning of the development of this project technology has become more and more relevant, and it must also be constantly updated and improved. These updates are tools for the translation center. This project seeks the

greatest immersion of technology in the linguistic trend, that is very present in other countries.

The SISTRACEN CAT degree project has been tested by programmers and by translators. Therefore, the main evaluation performed is the automatic translation of transcripts issued by UMSA University. This has been achieved by implementing the translation memory to the developed computer system. According to Tintaya, (2010) the evaluation of a project is the process of identifying, quantifying and assessing the costs and benefits generated from it, in a given period of time.

As a result, the main benefit of this project is the automatic translation of transcripts. In terms of costs, the costs of programming have been raised, so it would be advisable for CETI to develop a joint project to reduce costs.

CHAPTER IV

DATA ANALYSIS

At the moment of development any type of research, the results are important. For instance, in order to show that the results were based on the objectives proposed. As this paper is based on the stages carried out during this time, in this section the process of SISTRACEN usage is going to be explained. The computer program called SISTRACEN is a translation memory, which has been developed in order to translate the transcripts of the 54 careers in the various faculties belonging to UMSA University. These study programs have been previously translated and then inserted as translation memory in that program. It is also important to note that, given the technology, they are uploaded to the network in demo version. The main reason for the development of an idea of this magnitude is to provide a solution and answer the research question about the importance of the use of CAT.

4.1 Project Proposal Development

The present chapter describes the creation on a translation memory and CAT tool for the transcripts translation, in contribution to the CETI.

4.2 SISTRACEN (Sistema de Traducción de Certificado de Notas)

Before the development of the SISTRACEN, all the study programs of the 54 careers of the UMSA were collected. After that, all the courses were inserted in an EXCEL, separated by faculties and courses. Afterwards, the terms were translated one by one and then validated with three previously mentioned sources and later revised.

For the translation of UMSA transcripts, the translation memory (TM) required certain simple steps, in order to access SISTRACEN webpage program. From this point, the steps for the handling of the program will be developed, as they are presented below:

GRAPHIC 21. *Translation Memory Sample*

Facultad de Derecho y Ciencias Políticas	Faculty of Law and Political Science					
Derecho	Career In Law					
PRIMER AÑO	FIRST YEAR		IATE	LINGUEE	PROZ	CAMBRIDGE
Economía Política	Political Economy			https://www.linguee.com	https://www.proz.com/search/	
Introducción al Derecho	Introduction to Law			https://www.linguee.com	https://www.proz.com/search/	
Historia Jurídica y Política de Bolivia	Legal and Political History of Bolivia					
Sociología General	General Sociology			https://www.linguee.com	https://www.proz.com/search/	
Ciencia Política Teoría del Estado	Political Science			https://iate.europa.eu/s	https://www.linguee.com	https://www.proz.com/search/
Historia del Derecho y Derecho romano	History of Law and Roman Law			https://www.linguee.com	https://www.proz.com/search/	
Técnicas de investigación social I	Social Research Techniques I			https://iate.europa.eu/s	https://www.linguee.com	https://www.proz.com/search/
SEGUNDO AÑO	SECOND YEAR					

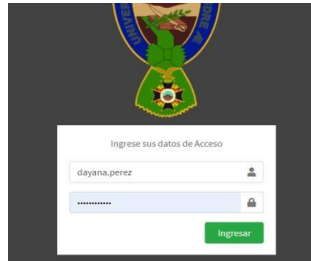
Source: Own elaboration

The table above shows the translation memory colors that help to determine the variability of the words. Red indicates high variability; yellow indicates medium variability and lilac or blue indicates no variability. This variability study could also have been done considering syntax rules. But at the moment of translation, the greatest variability that was found was with respect to the discipline in a semantic field.

FIRST: The SISTRACEN program is easy to access and is momentarily available (until June 2021) in the Google browser. Upon entering the user and password, it will be only accessed by CETI's translators. This as a security measure to limit access. Access page: <https://sistracen.megaboxinter.com/vistas/login.htm>.

First, it is necessary to enter the Google searcher engine to insert the web page. This will direct us to the home page, so access is limited because it contains institutional data. The benefits are that being an internet access platform, it can be used from anywhere and at any time. The main view of the page is simple and straightforward in its presentation; it also shows the UMSA logo.

GRAPHIC 22. *Introduction to SISTRACEN*



Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

SECOND: The screen on the left shows the possible options within the program.

GRAPHIC 23. *The content of SISTRACEN*



Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

THIRD: Join to the faculty and semester.

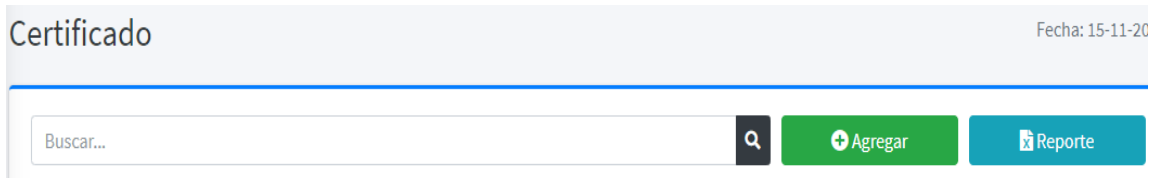
GRAPHIC 23. *The view of previous translated grades transcript.*

Opciones	#	Facultad	Carrera	Correlativo	Paterno	Materno	Nombres	CI	Registro Universitario	Periodo
	7	FACULTAD DE HUMANIDADES Y CIENCIAS DE LA EDUCACIÓN	LINGÜÍSTICA E IDIOMAS	080537	PEREZ	ZAMBRANA	DAYANA LIZETH	8333810	1675554	1° Semestre
	6	FACULTAD DE DERECHO Y CIENCIAS	DERECHO	255-2018	YUPANQUI	HUANCA	ACRLOS JAVIER	6452365	1234785	2° AÑO

Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

FOURTH: To add a new certificate, the *Add* option must be selected. And then, depending on the faculty, the computer-assisted translation will start.

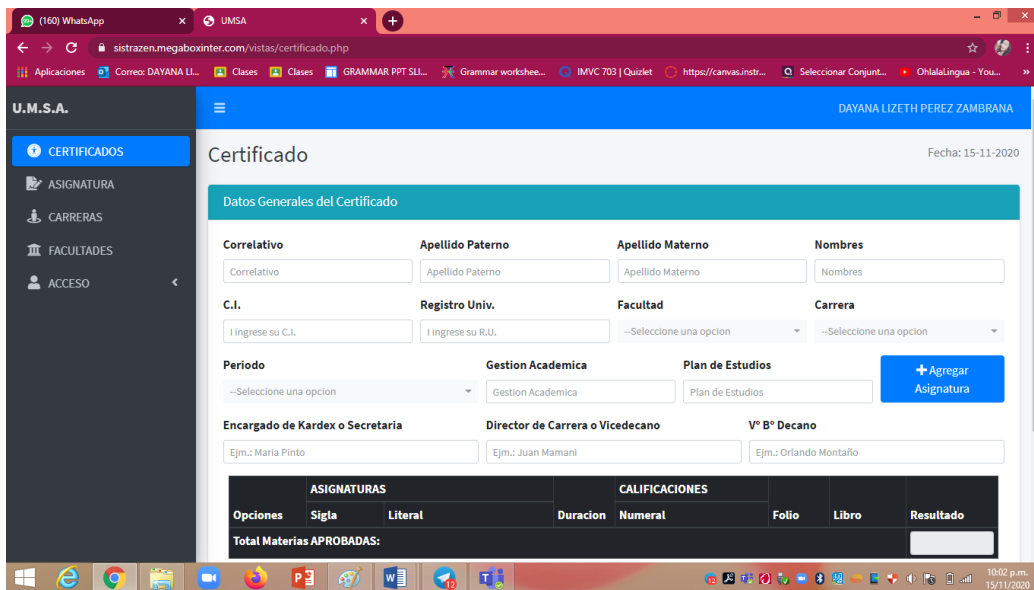
GRAPHIC 25. *The grades transcript layout*



Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

FIFTH: Choose the subject and fill the document information.

GRAPHIC 25. *The general data of grades transcript inserted on SISTRACE*



Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

GRAPHIC 26: *The general data of grades transcript inserted on SISTRACEN*

Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

SIXTH: The data must be filled in manually, since they vary depending on the student. When adding subjects, they are already in the translation memory, so the work is simplified and can be modified as well. In this list, the search list and the subjects are copied automatically.

GRAPHIC 27: SUBJECT LIST ADITION

Source: <https://sistrazen.megaboxinter.com/vistas/login.htm>

SEVENTH: After this, the certificate is automatically generated in Spanish and English on the page and in PDF format. This is followed by the post-editing process. Hence, the translation is completed in less time.

GRAPHIC 28. SAMPLE SPANISH VERSION:

UNIVERSIDAD MAYOR DE SAN ANDRES
CERTIFICADO DE CALIFICACIONES

Source:

SERIE "AI"

Bs. 3.50.-

N° 4
888

TITO	LIMA	Correlativo HENRY
Apellido Paterno 6741523	Apellido Materno 741852	Nombres FACULTAD DE ODONTOLOGÍA ODONTOLOGÍA
C.I.	Registro Univ.	Facultad Carrera

Calificaciones obtenidas durante el periodo lectivo 1° AÑO de la gestión académica de 2017 en conformidad al plan de estudios vigentes. 1993

ASIGNATURAS		Duracion	CALIFICACIONES		Folio	Libro	Resultado
Sigla	Literal		Numeral	Literal			
AHN100	ANATOMIA HUMANA Y NEUROANATOMIA	A	55	Cincuenta y cinco	123	456	APROBADO
CIT100	CITOLOGIA E HISTOLOGIA	A	67	Sesenta y siete	789	012	APROBADO
=====2 MATERIA(S) APROBADA(S)=====							

La Paz 24 de OCTUBRE de 2021

JUAN ADELIO QUISPE HUANCA	DRA. MARIA TERESA ROSARIO TERAN ZUBIETA	LIC. ORLANDO MONTAÑO MOLINA
ENCARGADO DE KARDEX O SECRETARIA	DIRECTOR DE CARRERA O VICEDECANO	V° B° DECANO

ADVERTENCIA: Este documento queda nulo si en él hubiesen hecho raspaduras, anotaciones o enmiendas.

NOTA.- Escala de calificaciones hasta junio de 1972; 1 a 7 y sus valores: 1 = pésimo; 2 = malo; 3 = deficiente; 4 = regular; 5 = bueno; 6 = muy bueno; 7 = excelente.

Escala de calificaciones desde julio de 1972; 1 a 100 y sus valores: 1 a 50 = reprobado; 51 a 63 = suficiente; 64 a 76 = bueno; 77 a 89 = distinguido; 90 a 100 = sobresaliente.

NOTA.- Para trámites en el exterior el certificado debe estar firmado por el Vicerector de la UMSA.

SISTRACEN sample elaboration

GRAPHIC 29: Sample English Version

MAYOR DE SAN ANDRES UNIVERSITY
GRADES TRANSCRIPT

AI SERIES

Bs. 3.50.-

N° 4

888

TITO	LIMA	Correlative HENRY	
First Name 6741523	Secod Name 741852	SCHOOL OF DENTISTRY	Name DENTISTRY
ID Card	University Registration	Faculty	Career / Degree

Scores obtained during the school year 1° AÑO of the academic management of 2017 in accordance with the study program. 1993

Initials	SUBJECTS Literal	Duration	SCORES		Folio	Book	Result
			Numeral	Literal			
AHN100	- HUMAN ANATOMY AND NEUROANATOMY	A	55		123	456	APPROVED
CIT100	- CYTOLOGY AND HISTOLOGY	A	67		789	012	APPROVED
=====2 APPROVED SUBJECTS=====							

La Paz October 24, 2020

JUAN ADELIO QUISPE HUANCA
KARDEX MANAGER OR SECRETARY

DRA. MARIA TERESA ROSARIO TERAN ZUBIETA
CAREER DIRECTOR OR VICE-DEAN

LIC. ORLANDO MONTAÑO MOLINA
V° B° DECAN

WARNING: This document is void if scratches, annotations or amendments have been made to it.

NOTE.- Scale of grades since July 1972; 1 to 7 and its values: 1=bad;2=bad; 3=deficient; 4=regular; 5=good;6=very good; 7=excellent.

Current rating scale since July 1972; 1 to 100 and its values: 1 to 50 = failed; 51 to 63 = sufficient; 64 to 76 = good; 77 to 89 = distinguished; 90 to 100 = excellent.

NOTE.- For procedures abroad, the certificate must be signed by the Vice-Rector of the UMSA.

Source: SISTRACEN automated translation

Finally, the certificate is completed, ready to be printed and to be given the subsequent stamps to certify the translation.

4.3 Objectives Reached

The software developed has the logo of UMSA University, and it has been created a user and password to protect the information of the TM. This provides security and saves the previous data.

The SISTRACEN system had the layout of the transcripts, the subjects of the 54 careers, the 13 faculties all translated and also validated with at least 3 reliable sources.

4.4 Proposal Organization

The data from the transcript are inserted so it will be possible to update the data if needed. In this way, the data has been carefully inserted to ensure the reliability and facilitate the insertion by the translator.

The data from the transcript are inserted so it will be possible to update the data if needed. In this way, the data has been carefully inserted to ensure the reliability and facilitate the insertion by the translator.

Later on, the subjects have been inserted following the order of semester, academic management and curriculum. A limitation was the code of each material that was inserted manually, since this is also modifiable. It is important to make clear that this program is a demo version, and it would be suggested to develop it for all the UMSA documents. For doing do, it is necessary the fusion of the knowledge of a linguist with that from programmers or layout designers, in order to develop an optimal work.

4.5 Proposal Development

The search for technological resources has taken time when analyzing different options and possibilities about technology; considering the options have been varied from ideas for the development of an app to creating a web page with a domain on the net.

However, the central idea is the use of technology in translation. For that reason, the project is limited to look for the most comfortable and accessible option.

Likewise, the validation of more than 3,000 terms took some time. Although several of the items were repetitive, the area of knowledge sometimes provided some variability in

at least 10% of the total terms. As a result, the development of the project was developed in one year.

Due to the increase of technology, this program has been uploaded to the Internet in a way that it could be accessed directly through any browser. Thus, the system is not lost or recorded and saved later. Training for the user can be required, but any of the translators who are the beneficiaries of this project are able to use it.

CHAPTER V

CONCLUSIONS

5.1 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this degree project, beyond the creation of the CAT program SISTRACEN (Sistema de Traducción de Certificados de Notas) in contribution to CETI (Centro de Enseñanza y Traducción de Idiomas) reached the TM creation for the 54 careers belonging to UMSA.

The S.W.O.T analysis from the questionnaire applied to the translators of CETI reflected the lack of technological tools. This shortage tends to imply less efficient and effective translation of transcript and other academic documents.

According to the general and specific objectives of this degree project, it has been created a translation memory for automatic translation of the UMSA undergraduate programs. So, the development was focused on the results of the terminology inserted on the TM that SISTRACEN compiled.

Subsequently, the general objective: to create a translation memory for automatic translation of the UMSA undergraduate programs, using CAT in contribution to CETI translators in La Paz city was reached; taking into account the design of study programs became a reality in the translation of academic documents from Spanish into English for CETI. In the same way, the CAT translation was also developed for incoming documentation of grades transcript. This project has been related to CAT Technology, in contribution to CETI (Centro de Enseñanza y Traducción de Idiomas). The main objective stated was to create a translation memory for automatic translation of the UMSA undergraduate programs, using computer-assisted translation in contribution to CETI translators in La Paz in order to establish efficiency and effectiveness to the academic translation process.

The translation of grades transcript and the translation memory creation were successfully created. This paper presented contextualized information about the terms

discipline translation at UMSA University, demonstrating that the use of CAT shortened the process of translating.

In order to achieve such a purpose, Roger T. Bell contribution suited the most for automated translation in contrast to the other models which had a variety of stages overloading this procedure as well its feasibility.

Moreover, the database design of the study programs in the translation of academic documents (from Spanish to English at CETI) made this paper acquire the following experiences: how to compile the data to make the document translation; how to make adjustments to the data compilation according to semester and annual careers; how to perform the literal and free translation process, making syntax adjustments; how to check the variability of terminology; and finally, how to make the term validation. All this process show that even if it is a complex process, when having the required CAT sources, it would be less difficult to translate.

During the translation stage, the terms validation was a difficult process. Consequently, three important web sites were consulted by translators: IATE; Linguee, Proz and Cambridge Dictionary. The three of them offered available translation options to make the task of validating and look for the best vocabulary variation of terminology. Furthermore, the terminology needed a careful review, because some disciplines require to have very specific technical words, and, at the same time, those words may have ambiguous meanings. In this case, the positive aspect is that the grades transcript are documents that are quite similar, with just some few parts needed to be changed.

5.2 RECOMMENDATIONS

After concluding the current project the following recommendations are proposed:

- It is indispensable to compile all the documents needed in order to get the database for the translation memory.
- It is advisable that translators with experience on the institution would be updated to modern knowledge in translation technological resources (which are used in CAT translations) such as: computer programs, apps, online web pages, editing computer programs, and so forth.
- The linguistic and languages department at UMSA university is the academic institution in La Paz city which has translation subjects. Thus, it would be important that this institution enhances programming subjects related to translation, keeping in mind the implementation of this translation project related with CAT.

To conclude the recommendations above, it should be considered by other researchers, when working with CAT processes, that it is the only way that as professionals can develop in contribution to society.

REFERENCES

- Alvarado, C. (2013). *Terminological database for improving the translation process at CETI*. La Paz-Bolivia: Universidad Mayor de San Andrés.
- Bell, T. R. (1991). *Translation and translating*. England, UK: Longman Group Limited.
- Byrne, J. (2009). The Coming of Age of Technical Translation: an Introduction. *The Journal of Specialised Translation*, N°2.
- DEFINITIONS. (2021, 07 20). Retrieved from <https://www.definitions.net/definition/academic+certificate>
- Figueroa, J. (2014). *Creación y alimentación de una memoria de traducción para la traducción del artículo People of no substance: Imposture and the contingency of morality in the colombian amazon*. Santiago-Chile: Universidad del Valle.
- Glossary of Linguistic Texts*. (n.d.). Retrieved from <https://glossary.sil.org/term/free-translation>
- Gomez, M. (2009). *Metodología de la Investigación Científica*. Cordoba-Argentina: Editorial Brujas.
- Grassilli, C. (2015, October). *A translator's thoughts*. Retrieved from <https://translathoughts.com/2016/02/word-for-word-translation/>
- Hilma, R. (2011). Literal Translation using Google Translator. In *Binus Business Review* (pp. 503-507).
- Semantic Translation (2021, September). Retrieved from <https://www.definitions.net/definition/semantic%20translation>.
- The Challenge of a Faithful Translation (2021, May). Retrieved from TSADRA: <https://www.tsadra.orgthe-challenge-of-a-faithful-translation/>
- Hurtado Albir, A. (2009). *Introducción a la traductología*. Madrid- España: Catedra Liguística S.A.
- Idiomatic Language Service. (n.d.). <https://www.idiomatic.net/>. Retrieved from <https://www.idiomatic.net/>
- ISO. (2021, 10 1). Retrieved from <https://www.iso.org/standard/59149.html>
- LAW INSIDER. (2021,September). *LAW INSIDER*. Retrieved from LEGAL DOCUMENT DEFINITION: <https://www.lawinsider.com/dictionary/legal-document>

Lequipe, E. (2015). *Translation of academic-legal documents and development of a terminology for the automatic translation of university diplomas*. La Paz-Bolivia: Universidad Mayor de San Andrés.

Newmark, P. (1995). *Manual de Traducción*, . Madrid: Ediciones Catedra S.A.

Postam, L. (2016, February). *GETBLEND*. Retrieved from <https://www.getblend.com/blog/literal-translation/>

PROYECTO ESTRELLA. (2012-2014). *Memoria del Centro de Enseñanza y Traducción de Idiomas CETI*. La Paz- Bolivia .

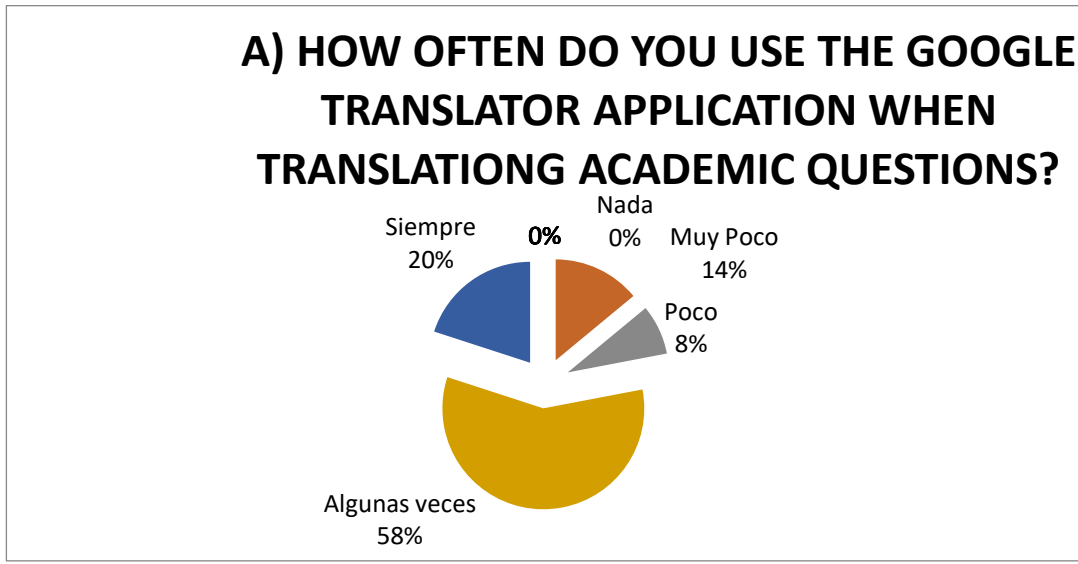
Soruco, S. (2015). *Systematization of translated documents through the implementation of translation memories*. La Paz- Bolivia: Universidad Mayor de San Andres.

Tintaya, P. (2008). Proyecto de Investigación. In P. Tinataya, *Proyecto de Grado* (pp. 347-368). La Paz-Bolivia: Instituto de Estudios Bolivianos .

TRANSLATION FACTORY. (2021, September). Retrieved from <https://www.translationfactory.com/our-services/technical-translation/>

ANNEX 1: STUDENTS QUESTIONNAIRE

**RESULTS OF THE STUDENTS' DIAGNOSTIC TEST
DATA ANALYSIS**

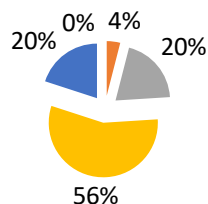


Source: Own elaboration

INTERPRETATION Q.A: According to the chart, from 100% represented by 50 students at Linguistics and Languages Career: 4 students that represent the 8% use a very little this app and the 14% answered that they use a little bit. On the other hand, 29 students who represent 58% of the total respondents answered that they use sometimes the Google Translator application. Also the 20% answer that the use always the Google Translator application. So from this point of view it may be concluded that students usually use the Google Translator application to translate.

B) DO YOU CONSIDER THAT WITH TECHNOLOGY THE TIME OF DOCUMENT TRANSLATION WOULD BE REDUCED?

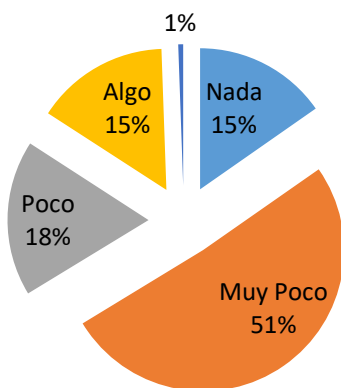
■ Nada ■ Muy Poco ■ Poco ■ Algunas Veces ■ Siempre



Source: Own elaboration

INTERPRETATION QB: According to the chart, from 100% represented by 50 students at Linguistics and Languages career: 2 students that represent the 4% answered that technology is need just very little. 20% answered that this project is need a little bit. While 28 students who represent 56% of the total respondents answered that they believe that sometimes the use of technology could help to improve the translation process. Also the 20% answered that they totally believe that technology would help to improve the translation process.

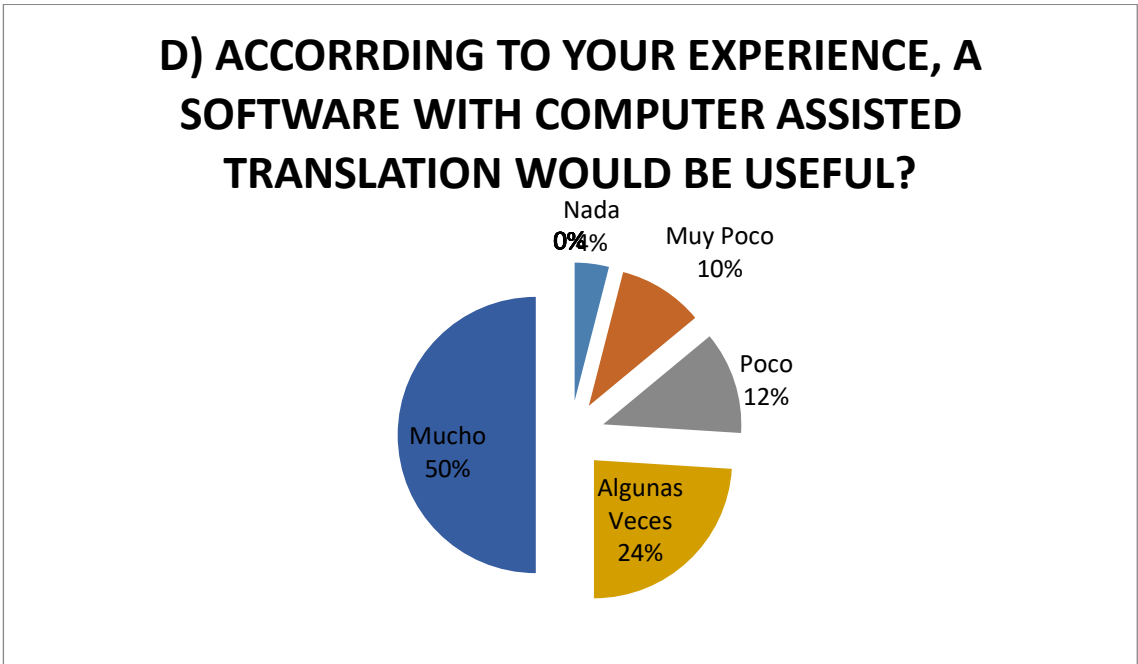
C) WHAT DO YOU KNOW ABOUT COMPUTER-ASISTED TRANSLATION?



Source: Own elaboration.

Source: Own elaboration

INTERPRETATION Q-C: According to the chart, from 100% represented by 50 students: 20 students representing 40% of the total respondents told that they know very little about CAT (Computer Assisted Translation). While the other percentage between the 18% know something about this topic and the 15% admitted not to have any idea about the automated translation with the use of CAT¹.

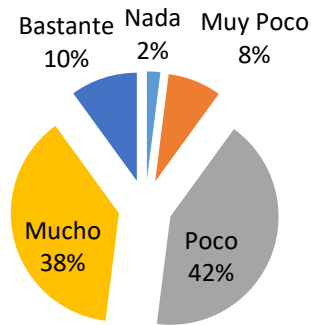


Source: Own elaboration.

INTERPRETATION Q-D: According to the chart, from 100% represented by 50 students: 25 students who represent 50% of the total think that a software that produces a Computer Assisted Translation would be useful, 12 students who represent 24% of the total think that sometimes it would be useful, 6 students that represent 12% of the total number thin it would help a little and 2 students who represent 4% of the total answered that it is not necessary this project.

¹CAT is used as the acronym of (Computer Assisted Translation)

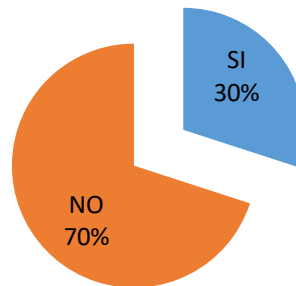
E) HOW WELL DO YOU KNOW ABOUT SPANISH-ENGLISH TRANSLATION OR VICE VERSA?



Source: Own elaboration

INTERPRETATION Q--E: According to the chart, from 100% represented by 50 students: 21 students who represent 42% of the total know a little bit about translation in English into Spanish and vice versa, 19 students who represent 38% of the total answer that they are concerned about translation, 4 students that represent 8% mentioned that they know very little about translation and 2 students who represent 4% of the total answered that they don't know about translation. On the other hand from the 10 % of the students know a lot about translation.

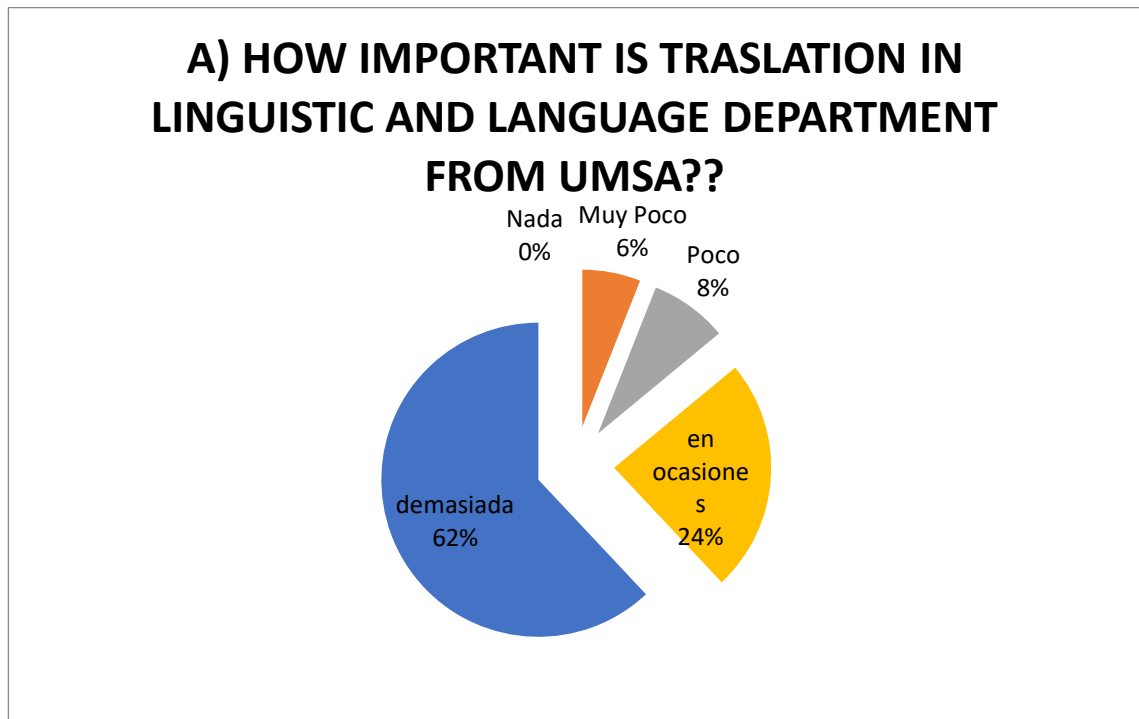
F) DO YOU KNOW THAT CETI TRANSLATES DOCUMENTS ?



Source: Own elaboration

INTERPRETATION Q-F: According to the chart, from 100% represented by 50 students: 15 students who represent 30% of the total respondents answer that they know that CETI carried out the academic documents translation, while 35 students that represent 70% of the total answered that they did not know that CETI carried out the translation task as a part of their institutional work.

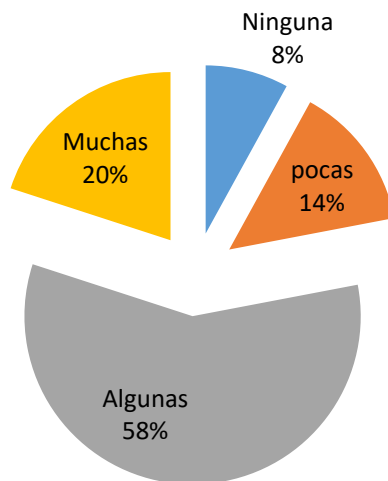
UNDERGRADUATE PROGRAMS



Source: Own elaboration

INTERPRETATION Q-A: According to the chart, from 100% represented by 50 students: 31 students who represent 62% of the total consider that the translation is very important in Linguistics and Language Department, 12 students who represent 24% of the total consider that sometimes the translation is important. Also between the 6% represent by 3 students and 8% represent by 4 students consider very little the importance of the translation inside the Linguistic and Languages Department.

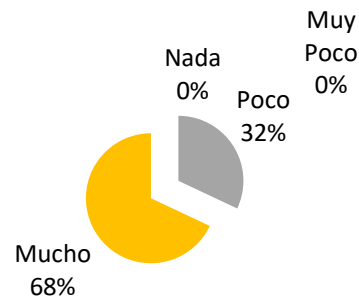
B) DO YOU HAVE ENGLISH-RELATED SUBJECTS IN YOUR CURRICULUM THAT NEED TO BE TRANSLATED?



Source: Own elaboration

INTERPRETATION QUESTION B: According to the chart, from 100% represented by 50 students: 4 students that represent the 8% believe that they don't need any translation for their subjects, 7 students who represent the 14% think they need few subjects translated, 29 students who represent 58% of the total believe that they need the translation of some subjects, 20% of the students represented by 10 students think they need the translation of all their subjects.

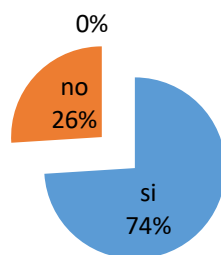
C) HOW IMPORTANT IS ENGLISH FOR ABROAD SCHOLARSHIPS IN YOUR CAREER?



Source: Own Elaboration

INTERPRETATION Q-C: According to the chart, from 100% represented by 50 students: 16 students who represent 32% of the total think that sometimes the English language is important for scholarships and the 68% of the total think that English is very important to get scholarships.

F) DO YOU THINK THAT TRANSLATION IS RELATED TO TECHNOLOGY IN THE ACADEMIC FIELD?



Source: Own elaboration

INTERPRETATION Q-D: According to the chart, from 100% represented by 50 students: 13 students who represent 26% of the total think that the technology and

The two translators mentioned that they use digital tools like electronic dictionaries, online dictionaries, equivalences web pages and specialized dictionaries in order to translate the documents.

Question 3

2. How much time does it take to translate the grades transcript and others?

According to their experience, the translation of the academic documents like degrees granted by UMSA and grades transcript could last almost 48 hours to 72 hours depending on the complexity of grades transcript the subject or the kind of undergraduate programs.

Question 4

1. Do you work with translation memories? How do you use them?

The translators use some translation memories through some translation programs and automated translation web pages to make their work easier in the sense of looking for equivalences used in the undergraduate programs.

Question 5

2. Do you have any software of automated translation? Which one?

The answer was that they use one system called SISTRATU, this work was an applied work is found in the library of the Faculty of Humanities and Education Sciences, for the translation degrees granted by UMSA.

Question 6

1. When you face difficult words, what techniques do you use to translate?

Related to the question about difficult words in translation the two translators mentioned that they used to read bibliography related to those kinds of documents to get more information about them and search information about the word by itself to find a good equivalence for the translation process.

Questions 7 and 8

2. Do you know what layout programming is?

3. What aspects would you include to make more efficient your work in the translation process?

These two questions imply the use of technology in the translation process. Both of the translators consider that it is necessary the implementation and creation of more technological resources for the translation process.

Questions 9 and 10

1. What areas require this type of translation?

Give your opinion about this type of translation.

The faculty that requires more the translation service in their academic documents is Faculty of Engineering and it is important for them in order to get better opportunities.


ANNEX 2: TRANSLATION DATABASE SAMPLE

Facultad de Humanidades y Ciencias de la Educación	Faculty of Humanities and Educational Sciences	
Bibliotecología y Ciencias de la Información	Library and Information Science Career	
Primer Año	First Year	
Introducción a las Ciencias de la Información	Introduction to Information Science	
Historia de las Fuentes Documentales	A History of Documentary Sources	
Museología	Museology	
Reprografía y Medios Audiovisuales	Reprography and Audiovisual Media	
Lenguaje y Técnicas de Redacción	Language and Writing Techniques	
Metodología de la Investigación I	Research Methodology I	
Historia de la Cultura	A History of Culture	
Historia Socioeconómica de Bolivia	SocioEconomic History of Bolivia	
Idioma I	Language I	


- The terms highlighted with red have high variation from discipline to discipline.
- The terms in yellow doesn't have a high variation.
- The terms in green doesn't have variation among disciplines.


- The sources of validation that were used IATE, LINGUEE, PROZ AND CAMBRIDGE dictionary in few cases.

ANNEX 3: SISTRACEN



Ingrese sus datos de Acceso



















Usuario 

Contraeña 

- The access to SISTRACEN is with user and password to protect the confidentiality of database of translation memory.

ANNEX 4

EVALUATION TO SISTRACEN TRANSLATION OF GRADES TRANSCRIPT

  	7	FACULTAD DE HUMANIDADES Y CIENCIAS DE LA EDUCACIÓN	LINGÜÍSTICA E IDIOMAS	080537	PEREZ	ZAMBRANA	DAYANA LIZETH	8333810	1675554	1° Semestre
  	6	FACULTAD DE DERECHO Y CIENCIAS POLÍTICAS	DERECHO	255-2018	YUPANQUI	HUANCA	ACRLOS JAVIER	6452365	1234785	2° AÑO
  	5	FACULTAD DE CIENCIAS PURAS Y NATURALES	INFORMÁTICA	798789	ARTEAGA		EDSON	6456254	5346531	1° Semestre
  	4	FACULTAD DE ODONTOLOGÍA	ODONTOLOGÍA	888	TITO	LIMA	HENRY	6741523	741852	1° AÑO
  	3	FACULTAD DE AGRONOMÍA	INGENIERÍA AGRONÓMICA	123	ROMERO	TITO	JUANA	6748596	123	1° Semestre
  	2	FACULTAD DE MEDICINA,	MEDICINA	13	APAZA	TOLA	XIMENA	4789526	456465	1° AÑO

Facultad de Derecho y Ciencias Políticas **Faculty of Law and Political Science**

Derecho **Career In Law**

PRIMER AÑO **FIRST YEAR**

Economía Política Political Economy

Introducción al Derecho Introduction to Law

Historia Jurídica y Política de Bolivia Legal and Political History of Bolivia

Sociología General General Sociology

Ciencia Política Teoría del Estado Political Science

Historia del Derecho y Derecho romano History of Law and Roman Law

Técnicas de investigación social I Social Research Techniques I

SEGUNDO AÑO **SECOND YEAR**

Derecho Económico y Empresarial Economic and Business Law

Derecho informático Computer Law

Sociología Jurídica Legal Sociology

Derecho civil I: Personas Y Derechos Reales Civil Law I: People and Real Rights

Derecho Municipal	Municipal Law
Criminología	Criminology
Derecho Constitucional	Constitutional Law
TERCER AÑO	THIRD YEAR
Derecho Penal I	Criminal Law I
Derecho Civil II Obligaciones	Civil Law II Obligations
Derecho del Trabajo	Labour Law
Derecho De La Seguridad Social	Social Security Law
Técnicas De Investigación Jurídica II	Legal Research Techniques II
Derecho Internacional Público	Derecho Internacional Público
Derecho Administrativo Y Ciencia Administrativa	Administrative Law and Administrative Science
MENCIÓN ÁREA PENAL (01)	MENTION PENAL AREA (01)
CUARTO AÑO	FOURTH YEAR
Derecho Civil III Contratos	Civil Law III Contracts
Derecho Procesal Orgánico y La Ley de Organización Judicial	Organic Procedural Law and the Law on Judicial Organisation
Derecho Penal II: Parte Especial	Criminal Law II: Special Part

Derecho De Familia y del Menor Family and Children's Law

Medicina Legal Forensic Medicine

Derechos Humanos Human Rights

Criminalística y Victimología Criminalistics and Victimology

Derecho Penitenciario Prison Law

QUINTO AÑO FIFTH YEAR

Derecho Civil IV Sucesiones Civil Law IV Succession

Derecho Procesal Civil II: P. F.C. Civil Procedure Law II: P.F.C.

Derecho Procesal Penal III : P. F. P. Procedural Criminal Law III : P. F. P.

Seminario Seminar

Psiquiatría Forense Forensic Psychiatry

Clinica Legal Legal Clinic

Filosofía del Derecho Philosophy of Law

**MENCIÓN ÁREA MENTION PRIVATE AREA
PRIVADA (02) (02)**

CUARTO AÑO FOURTH YEAR

Derecho Civil III Contratos Civil Law III Contracts

Derecho Financiero y Tributario	Financial and Tax Law
Derecho Minero y de Hidrocarburos	Mining and Hydrocarbons Law
Derecho Procesal Orgánico y la Ley De Organización Judicial	Organic Procedural Law and the Law on Judicial Organization
Derecho Comercial	Commercial Law
Derecho Agrario	Agricultural Law
Derecho Penal II: Parte Especial	Criminal Law II: Special Part
Derecho de Familia y del Menor	Family and Children's Law
QUINTO AÑO	FIFTH YEAR
Derecho Civil IV Sucesiones	Civil Law IV Succession
Derecho Procesal Civil II: P. F. C.	Civil Procedure Law II: P.F.C.
De recho Procesal Penal III: P. F. P.	De recho Procesal Penal III: P. F. P.
Derecho Internacional Privado	Private International Law
Derecho De Comunicacion y Transportes	Right of Communication and Transport
Filosofía Del Derecho	Philosophy of Law

Seminario		Seminar
MENCIÓN PÚBLICA	ÁREA	MENTION PUBLIC AREA
CUARTO AÑO		FOURTH YEAR
Derecho Civil III: Contratos		Civil Law III: Contracts
Derecho Financiero y Tributario		Financial and Tax Law
Derecho Minero E Hidrocarburos		Mining Law and Hydrocarbons
Derecho Procesal Orgánico Y La Ley De Organización Judicial		Organic Procedural Law and the Law on Judicial Organization
Derecho Agrario		Agricultural Law
Derecho Penal II: Parte Especial		Criminal Law II: Special Part
Derecho De Familia Y Del Menor		Family and Children's Law
Derecho Ecologico		Enviormental Law
QUINTO AÑO		FIFTH YEAR
Derecho Civil IV Sucesiones		Civil Law IV Succession
Derecho Procesal Penal III: P. F. P.		Criminal Procedure Law III: P. F. P.
Seminario		Seminar

Derecho De Comunicacion Y Transportes	Communication and Transport Law
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Sistemas Politicos Electorales	Political Election Systems
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Filosofía Del Derecho	Philosophy of Law
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MENCIÓN INTERNACIONAL	ÁREA MENTION INTERNATIONAL AREA
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CUARTO AÑO	FOURTH YEAR
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Derecho Civil III: Contratos	Civil Law III: Contracts
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Derecho Procesal Orgánico y la Ley De Organización Judicial	Organic Procedural Law and the Law on Judicial Organisation
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Derecho Penal II: Parte Especial	Criminal Law II: Special Part
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Derecho De Familia y Del Menor	Family and Children's Law
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Derecho Comercial	Commercial Law
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Derecho Ecologico	Environmental Law
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Derecho de Integración	Right of Integration
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Derecho Diplomatico	Diplomatic Law
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QUINTO AÑO	FIFTH YEAR
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Derecho Civil IV: Sucesiones	Civil Law IV: Inherit
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Derecho Procesal Civil II: P. F. C.	Civil Procedure Law II: P.F.C
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Derecho Procesal Penal III: P. F. P.	Criminal Procedural Law III: P.F.P.
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Seminario	Seminar
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Derecho Internacional Privado	Private International Law
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Contratos y Convenios Internacionales	International Contracts and Agreements
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Filosofía Del Derecho	Legal Philosophy
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Ciencias Políticas y Gestión Pública	Political Science and Public Management
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Primer Semestre	First Semester
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Introduccion al Derecho	Introduction to Law
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Economia General	General Economy
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Contabilidad I	Accounting I
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Matematicas I	Mathematics I
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Informatica General	General Computing
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Segundo Semestre	Second Semester
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Administracion II	Administration II
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Derecho Contitucional	Constitutional Law
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Microeconomia	Microeconomics
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Matematicas II	Mathematics II
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Sociologia	Sociology
Taller I (Análisis de Mypes)	Workshop I (Mypes Analysis)
Tercer Semestre	Third Semester
Comportamiento Organizacional	Organizational Behavior
Derecho Administrativo	Administrative Law
Macroeconomía	Macroeconomics
Sociología II	Sociology II
Estadística I	Statistics I
Administración Pública I	Public Administration I
Cuarto Semestre	Fourth Semester
Administración Pública II	Public Administration II
Derecho Tributario	Fiscal Law
Liderazgo y Negociación	Leadership and Negotiation
Estadística II	Statistics II
Gestión de Recursos Humanos I	Human Resource Management I
Guarani I	Guarani I
Quinto Semestre	Fifth Semester
Administración Pública III	Public Administration III
Gestión de Recursos Humanos	Human Resource Management II

II

Administracion Financiera Financial Management

Sistemas de Informacion Management Information
Administrativa Systems

Relaciones Internacionales International Relations

Guarani II Guarani II

Sexto Semestre Sixth Semester

Gestion De Procesos Process Management

Politica Economica Economic Policy

Etica Profesional Professional Ethics

Administracion Municipal Municipal Administration

Organizacion y Metodos Organization and Methods

Taller II (Analisis Social, Workshop II (Social, Political &
Politico Y Economico) Economic Analysis)

Marketing Politico Political Marketing

Séptimo Semestre Seventh Semester

Planificacion y Desarrollo Planning and Development

Gestion de Gobiernos Regional Government
Regionales Management

Investigacion Administrativa Administrative Investigation

Finanzas Publicas I Public Finance I

Etica en la Gestion Publica	Ethics in Public Management
Derecho Laboral	Labor Law
Octavo Semestre	Eighth Semester
Gestion Empresarial	Business Management
Formulacion y Evaluacion de Proyectos	Project Formulation and Evaluation
Finanzas Publicas II	Public Finance II
Taller III (Planificacion Participativa)	Workshop III (Participatory Planning)
Politiclas Publicas I	Public Policies I
Contabilidad y Auditoria Gubernamental	Government Accounting and Auditing
Noveno Semestre	Ninth Semester
Gestion y Control del Sector Publico	Public Sector Management and Control
Administracion de Proyectos	Project Management
Politiclas Publicas II	Public Policies II
Creacion de Empresas	Business Creation
Licitaciones Publicas	Public Tenders
Actividad Profesionalizacion I	de Professionalization Activity I
Décimo Semestre	Tenth Semester

Actividad de Professionalization Activity II
Profesionalizacion II

**Facultad de Arquitectura, Artes, Architecture Degree
Diseño y Urbanismo**

Primer Año

First Year

Taller de Proyectos I

Project Workshop I

Teoría y Morfología I

Theory and Morphology I

Representación y Expresión I

Representation and
Expression I

Introducción a la Historia de la
Arquitectura

Introduction to the History
of Architecture

Teoría, Métodos y técnicas de
Investigación

Theory, Methods and
Research Techniques

Edificaciones I

Buildings I

Condiciones Ambientales en
Arquitectura

Environmental Conditions
in Architecture

Razonamiento Matemático

Mathematical Reasoning

Segundo Año

Second Year

Taller de Proyectos II

Project Workshop II

Teoría de Morfología II

Morphology Theory II

Representación y Expresión II

Representation and

	Expression II
Historia de la Arquitectura II	History of Architecture II -
Urbanismo y Territorio I	Town and Country Planning I
Edificaciones II	Buildings II
Diseño de Instalaciones	Facilities Design
Tipología de las Estructuras	Typology of Structures
Tercer Año	Third Year
Taller de Proyectos III	Project Workshop III
Teoría y Morfología	Theory and Morphology
Representación y Expresión III	Representation and Expression III
Historia de la Arquitectura	History of Architecture
Urbanismo y territorio	Urban Planning and territory
Edificaciones III	Buildings III
Instalaciones Especiales	Special facilities
Análisis Estructural I	Structural Analysis I
Cuarto Año	Fourth Year
Taller de Proyectos IV	Project Workshop IV
Teoría y Morfología IV	Theory and Morphology IV

Historia de la Arquitectura III	History of Architecture III
Urbanismo Territorio III	Town Planning Territory III
Edificaciones IV	Buildings IV
Análisis IV	Analysis IV
Análisis Estructural III	Structural Analysis III
Quinto Año	Fifth Year
Taller de Grado	Grade Workshop
Seminarios Especializados	Specialized Seminars

Plastic Arts Degree

Primer Año	Fisrt Year
Taller de Dibujo I	Drawing Workshop I
Taller de Estructura I	Structure Workshop I
Taller de Grado I	Workshop Degree I
Taller de Pintura I	Painting Workshop I
Diseño de Composición	Composition Design
Historia General del Arte I	General History of Art I
Sociología del Arte	Sociology of Art
Iniciación a la Investigación	Initiation to the Investigation

Segundo Año	Second Year
Taller de Dibujo II	Drawing Workshop II
Taller de Escritura II	Writing Workshop II
Taller de Grabado II	Engraving Workshop II
Taller de Pintura II	Painting Workshop II
Talle de Cerámica I	Ceramic Sizes I
Historia General del Arte II	General History of Art II
Psicología del Arte	Psychology of Art
Dibujo lineal	Linear Drawing
Tercer Año	Third Year
Taller de Dibujo III	Drawing Workshop III
Taller de Estructura II(Mención)	Structure Workshop II(Mention)
Taller de Grabado III(Mención)	Engraving Workshop III(Mention)
Taller de Pintura III (Mención)	Painting Workshop III (Mention)
Taller de Fotografía	Photography Workshop
Historia General del Arte III	General History of Art III
Historia del Arte Americano y Nacional I	History of American and National Art I
Taller de Cerámica II	Ceramic Workshop II

Cuarto Año	Fourth Year
Taller de Dibujo IV	Drawing Workshop IV
Taller de Estructura IV (Mención)	Structure Workshop IV (Mention)
Taller de Grabado IV (Mención)	Engraving Workshop IV (Mention)
Taller de Pintura IV (Mención)	Painting Workshop (Mention)
Taller Audiovisual (Mención)	Audiovisual Workshop (Mention)
Historia General del Arte IV	General History of Art IV
Historia del Arte Americano y Nocional II	American and Notional Art History II
Teoría General del Arte II	General Theory of Art II
Serigrafía Artística	Artistic Silk-Screen Printing
Taller de Fundición (Optativa)	Foundry Workshop (Optional)
Metodología de la Investigación	Research Methodology
Graphic Design Degree	
Primer Año	First Year
Taller de Dibujo I	Drawing Workshop I

Taller de Estructura I	Structure Workshop I
Taller de Grabado I	Engraving Workshop I
Taller de Pintura I	Painting Workshop I
Diseño y Composición	Design and typesetting
Historia General del Arte	General History of Art
Sociología del Arte	Sociology of Art
Iniciación a la Investigación	Initiation to the Investigation
Segundo Año	Second Year
Taller de Dibujo II	Drawing Workshop II
Diseño Publicitario I	Advertising Design I
Historia General del Arte II	General History of Art II
Dibujo Lineal	Linear Drawing
Taller de Fotografía	Photography Workshop
Historia del Arte Americano y Nacional I	History of American and National Art I
Artes Gráficas	Graphic Arts
Redacción Publicitaria	Copywriting
Tercer Año	Third Year
Dibujo Publicitario I	Advertising Drawing I
Serigrafía Técnica	Technical Silk-Screen

	Printing
Teoría y Técnica de la Publicidad I	Theory and Technique of Advertising I
Taller de Dibujo II	Drawing Workshop II
Diseño Publicitario II	Advertising Design II
Taller de Fotografía Publicitaria	Advertising Photography Workshop
Administración	Administration
Historia del Arte Americano y Nacional II	History of American and National Art II
Cuarto Año	Fourth Year
Dibujo Publicitario II	Advertising Drawing II
Diseño Gráfico Computarizado	Computer Graphic Design
Serigrafía II	Silk-screen printing II
Teoría y Técnica de la Publicidad II	Theory and Technique of Advertising II
Taller de Dibujo IV	Drawing Workshop IV
Taller Audio Visual	Audio Visual Workshop
Práctica Empresarial	Business Practice
Metodología de la Investigación	Research Methodology

Facultad de Odontología**School of Dentistry****Odontología****Dentistry****PRIMER AÑO****FIRST YEAR**

Anatomia Humana y Neuroanatomia

Human Anatomy and Neuroanatomy

Citologia e Histologia

Cytology and Histology

Embriologia y Genetica

Embryology and Genetics

Sociologia

Sociology

Bioquimica

Biochemistry

SEGUNDO AÑO**SECOND YEAR**

Anatomia y Escultura Dentaria

Dental Anatomy and Sculpture

Fisiologia General y de la Oclusion

General and Occlusion Physiology

Patologia General e Histopatologia Bucal

General Pathology and Oral Histopathology

Farmacologia General y Terapeutica

General Pharmacology and Therapeutics

Microbiologia y Parasitologia G. y E.

Microbiology and Parasitology G. and E.

Bioestadistica y Demografia y Metodologia de la Investigacion

Biostatistics and Demography and Research Methodology

Materiales Odontologicos

Dental Materials

TERCER AÑO

THIRD YEAR

Semiologia General

General Semiology

Patologia Estomatologica

Stomatological Pathology

Periodoncia I (PROFILAXIS Bucal)

Periodontics I (PROFILAXIS Mouth)

Protesis Removible I

Removable Prosthesis I

Operatoria Dental I

Dental Surgery I

Cirurgia Bucal I

Mouth Surgery I

Protesis Fija I

Fixed Prosthesis I

Semiologia Estomatologica

Stomatological Semiology

Radiologia I

Radiology I

CUARTO AÑO

FOURTH YEAR

Psicologia Aplicada a la Odontologia

Psychology Applied to Dentistry

Periodoncia II

Periodontics II

Operatoria Dental II y Endodoncia

Dental Surgery II and Endodontics

Cirurgia Bucal II

Mouth Surgery II

Protesis Fija II

Fixed Prosthesis II

Protesis Removible II

Removable Prosthesis II

Odontopediatria I	Pediatric Dentistry I
Ortodoncia Preventiva I	Preventive Orthodontics I
Radiologia II	Radiology II
QUINTO AÑO	FIFTH YEAR
Clinica Integral Adultos	Comprehensive Clinic for Adults
Clinica Integral Niños	Integral Clinic Children
Odontologia Legal y Deontologia	Legal Dentistry and Deontology
Odontologia Sanitaria	Sanitary Dentistry
Practica Hospitalaria	Hospital Practice
Ortodoncia Correctiva II	Corrective Orthodontics I
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Facultad de Medicina, Enfermería, Nutrición y Tecnología Médica	School of Medicine, Nursing, Nutrition and Medical Technology
Tecnología Médica	Medical Technology
MENCIÓN RADIOLOGÍA	RADIOLOGY MENTION
Anatomía Básica Normal	Normal Basic Anatomy
Anatomía Radiológica	Radiological Anatomy

Bioestadística	Biostatistics
Bioquímica	Biochemistry
Física de las Radiaciones	Radiation Physics
Histología Básica	Basic Histology
Introducción a la Técnica Radiológica	Introduction to Radiological Technique
Primeros Auxilios	First Aid
Proyección a la Comunidad	Community Outreach
PRIMER AÑO	FIRST YEAR
Fisiología Humana-Biofísica	Human-Biophysical Physics
Patología General	General Pathology
Psicología Aplicada	Applied Psychology
Radioquímica – Radiostopos	Radiochemistry - Radiostopes
Radioterapia	Radiotherapy
I	Radiological Technique I
Técnica Radiológica II	Radiological Technique II
SEGUNDO AÑO	SECOND YEAR
Internado Rotatorio	Rotary Boarding School
Egreso Final	Undergraduate Exit
TERCER AÑO	THIRD YEAR

MECIÓN CLÍNICO	LABORATORIO	CLINICAL CONCEPT	LABORATORY
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PRIMER AÑO		FIRST YEAR	
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Anatomía Humana		Human Anatomy	
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Biología		Biology	
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Introduccion al Laboratorio		Introduction to the Laboratory	
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Histología		Histology	
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Primeros Auxilios		First Aid	
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Salud Pública		Public Health	
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Química Inrogánica y Orgánica		Inorganic and Organic Chemistry	
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SEGUNDO AÑO		SECOND YEAR	
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Fisiología y Biofísica		Physiology and Biophysics	
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Patología General		General Pathology	
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Inmunología		Immunology	
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Bioquímica		Biochemistry	
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Citopatología		Cytopathology	
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Técnicas en Patología		Techniques in Pathology	
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Genética		Genetics	
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Metodologías de la Investigación		Research Methodologies -	
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Ética y Bioética		Ethics and Bioethics	
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TERCER AÑO	THIRD YEAR
Patología Clínica	Clinical Pathology
Hematología	Haematology
Paracitología General y Diagnóstica	General Paracitology and Diagnosis
Farmacitología, Toxicología y Laboratorio Forense	Pharmacology, Toxicology and Crime Lab
Microbiología General	General Microbiology
Bancos de Sangre	Blood Banks
MENCIÓN DE FISIOTERAPIA Y KINESTIECIOLOGÍA	MENTION OF PHYSIOTHERAPY AND KINESIOLOGY
PRIMER AÑO	FIRST YEAR
Anatomía Funcional	Functional Anatomy
Biosestática	Biostatistics
Fisiología Humana-Biofísica	Human-Biophysical Physiology
Histología	Histology
Patología General	General Pathology
Primeros Auxilios	First Aid
Proyección a la Comunidad	Community Outreach
Psicología Aplicada	Applied Psychology
Semiología Aplicada	Applied Semiology

SEGUNDO AÑO	SECOND YEAR
Cinesiterapia	Kinesiotherapy
Electro Terapia	Electrotherapy
Fisioterapia General	General Physiotherapy
Fisioterapia Aplicada I	Applied Physiotherapy I
Fisioterapia Aplicada II	Applied Physiotherapy II
Kinefilaxia	preventive physical therapy
Kinesteciología	Kinesteciology
Mecanoterapia	Mechanotherapy
Nosología Médica Quirúrgica	Medical Surgical Nosology -
Terapia Ocupacional	Occupational Therapy
TERCER AÑO	THIRD YEAR
Enfermería Aplicada	Applied Nursing
Farmacología	Pharmacology
Biomecánica	Biomechanics
Bioquímica	Biochemistry
Fisioterapia en el Deporte	Physiotherapy in Sport
Imagenología Aplicada	Applied Imaging
Neurología	Evolutiva Evolutionary Neurology
Psicomotricidad	Psychomotricity -
Semiopatía Kinestésica	Kinesthetic Semiopathy

Taller de Prótesis y Órtesis	Prosthesis and Orthosis Workshop
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CUARTO AÑO

FOURTH YEAR

Ética y Bioética

Ethics and Bioethics

Gerencia y Administración de
Salud

Health Management and
Administration

Medicina Tradicional-Boliviana

Traditional-Bolivian Medicine

Rehabilitación en Base a la
Comunidad

Community Based Rehabilitation
-

Taller de Métodos de Investigación

Research Methods Workshop -

Técnicas de Revitalización
Geriátrica

Revitalization Techniques

Técnicas Kinestésicas Especiales

Special Kinesthetic Techniques

Terapias Alternativas

Alternative Therapies

Clínica Kinesika

Kinésika Clinic

QUINTO AÑO

FIFTH YEAR

Internado Rotatorio

Rotary Boarding School

Egresos Final

Final Expenditures

POSTGRADO

POSTGRADUATE

Maestría en Salud Pública
(Duración 2 años) Mención:
Gerencia en Salud

Master of Public Health (Duration
2 years) Mention: Health
Management

Maestría en Medicina Forense

Master of Forensic Medicine

Medicina

MEDICINE SCHOOL

PRIMER AÑO

FIRST YEAR

Anatomía Humana

Human Anatomy

Embriología y Genética

Embryology and Genetics

Histología

Histology

Salud Pública I

Public Health I

SEGUNDO AÑO

SECOND YEAR

Bioquímica

Biochemistry

Fisiología – Biofísica

Physiology /Biophysics

Microbiología

Microbiology

Parasitología

Parasitology

Salud Pública II

Public Health II

TERCER AÑO

THIRD YEAR

Anatomía Patológica

Pathological Anatomy

Cirugía I

Surgery I

Farmacología

Pharmacology

Fisiopatología

Physiopathology

Medicina I

Medicine I

Psicología Médica

Medical Psychology

CUARTO AÑO

FOURTH YEAR

Cirugía II

Surgery II

Medicina II

Medicine II

Neurología – Neurocirugía

Neurology - Neurosurgery

Psiquiatría – Psicopatología

Psychiatry /Psychopathology

Salud Pública III

Public Health III

Traumatología – Ortopedia

Traumatology /Orthopedics

QUINTO AÑO

FIFTH YEAR

Cirugía III

Surgery III

Ginecología

Gynaecology

Medicina III

Medicine III

Medicina Legal

Forensic Medicine

Obstetricia

Obstetrics

Pediatría

Pediatrics

Salud Pública IV

Public Health IV

Enfermería

NURSERY CAREER

PRIMER AÑO

FIRST YEAR

Anatomía Y Fisiología Humana	Human Anatomy and Physiology
Bioestadística Y Demografía	Biostatistics and Demography
Bioquímica	Biochemistry
Psicología del Desarrollo Humano	Psychology of Human Development
Socio-Antropología	Socio-Anthropology
Microbiología	Microbiology
Parasitología	Parasitology
Pedagogía y Didáctica	Pedagogy and Didactics
Enfermería En Atención Primaria	Primary Care Nursing
Enfermería Básica	Basic Nursing
SEGUNDO AÑO	SECOND YEAR
Epidemiología	Epidemiology
Metodología De La Investigación	Research Methodology
Idioma Nativo	Native Language
Nutrición Y Dieto-Terapia	Nutrition and Diet Therapy
Farmacología	Pharmacology
Enfermería Fundamental	Fundamental Nursing -
Enfermería Social Y Comunitaria	Social and Community Nursing -
TERCER AÑO	THIRD YEAR
Administración Sanitaria	Health Administration -

Medicina Tropical y De La Altura	Tropical & Altitude Medicine -
Etica Y Legislación En Enfermería	Ethics and Legislation in Nursing -
Enfermería En Salud Del Adulto Y Trabajador	Adult and Worker Health Nursing -
Enfermería Médico Quirúrgica	Surgical Medical Nursing -
Enfermería En Salud Mental Y Psiquiatría	Mental Health and Psychiatric Nursing
CUARTO AÑO	FOURTH YEAR
Enfermería En Salud Materno Infantil	Mother and Child Health Nursing
Enfermería Pediátrica	Pediatric Nursing
Enfermería Gineco Obstétrica	Obstetrics and Gynecology Nursing
Administración De Servicios En Enfermería	Nursing Services Administration
QUINTO AÑO	FIFTH YEAR
Internado Rotatorio	Rotary Boarding School
Proyecto de Grado	Degree Project
Grado	Degree
Por excelencia	Par excellence
Nutrición y Dietética	NUTRITION AND

DIETETICS CAREER

PRIMRE AÑO

FIRST YEAR

Taller Desarrollo Personal (MODULAR) Workshop on Personal Development (MODULAR)

Introducción A La Alimentación Y Nutrición (MODULAR) Introduction to Food and Nutrition (MODULAR)

Biología Y Genética (ANUAL) Biology y Genetics (ANNUAL)

Morfofisiología (ANUAL) Morphophysiology (ANNUAL)

Bioquímica (ANUAL) Biochemistry (ANNUAL)

Sociología Y Antropología (SEMESTRAL (1ER./S.)) Sociology and Anthropology (SEMESTER (1ER./S.))

Idioma Nativo ((Quechua Y/O Aymara) ANUAL) Native Language ((Quechua AND/OR Aymara) ANNUAL)

Inglés Técnico (ANUAL) Technical English (ANNUAL)

Práctica Integral I (MODULAR) Integral Practice I (MODULAR)

SEGUNDO AÑO

SECOND YEAR

Nutrición Básica (ANUAL) Basic Nutrition (ANNUAL)

Técnica Dietética (ANUAL) Dietetic Technique (ANNUAL)

Bioquímica De Los Alimentos Y Bromatología (ANUAL) Food Biochemistry and Bromatology (ANNUAL)

EDUCACIÓN (Pduc) Y EDUCACIÓN FOOD AND EDUCACIÓN ALIMENTARIA Y NUTRICION EDUCATION

NUT. (ANUAL)	(ANNUAL)
Microbiología (SEMESTRAL (1er. S.))	Microbiology (SEMESTERLY (1st. S.))
Parasitología (SEMESTRAL (2do. S.))	Parasitology (SEMESTER (2nd. S.))
Metodología De La Investigación Y Estadística Descriptiva (ANUAL)	Research Methodology and Descriptive Statistics (ANNUAL)
Práctica Integral II (MODULAR)	Integral Practice II (MODULAR)
TERCER AÑO	THIRD YEAR
Fisiopatología (ANUAL)	Physiopathology (ANNUAL)
Dietoterapia ((Adulto) ANUAL)	Diet Therapy ((Adult) ANNUAL)
Nutrición Aplicada (ANUAL)	Applied Nutrition (ANNUAL)
Investigación Aplicada E Introducción A La Estadística Inferencial (ANUAL)	Applied Research and Introduction to Inferential Statistics (ANNUAL)
Farmacología (ANUAL)	Pharmacology (ANNUAL)
Psicología General Y Evolutiva (SEMESTRAL (1er. S.))	General and Evolutionary Psychology (SEMESTERLY (1st. S.))
Práctica Integral III (MODULAR)	Integral Practice III (MODULAR)
CUARTO AÑO	FOURTH YEAR

Dietoterapia Del Niño Y Child and Adolescent Diet
Adolescente (ANUAL) Therapy (ANNUAL)

Demografía-Epidemiología Y Demographics-Epidemiology
Saneamiento Ambiental (ANUAL) and Environmental Sanitation
(ANNUAL)

Planificación De Programas Y Nutrition Programme and Project
Proyectos En Nutrición (ANUAL) Planning (ANNUAL)

Economía Y Política Alimentaria Food Economics and Policy
(ANUAL) (ANNUAL)

Administración General Y General and Health
Sanitaria (ANUAL) Administration (ANNUAL)

Administración Departamentos De Administration Departments of
Alimentación Y Nutrición Food and Nutrition (ANUAL)
(ANUAL)

Vigilancia Epidemiológica Food and Nutrition
Alimentaria Y Nutricional Epidemiological Surveillance
(MODULAR) (MODULAR)

Tecnología De Alimentos Food Technology (ANNUAL)
(ANUAL)

QUINTO AÑO

FIFTH YEAR

Internado Área Clínica y Clinical and Administrative
Administrativa (SEMESTRAL) Internship (SEMESTERLY)

Internado en Salud Pública Public Health Internship
(SEMESTRAL) (SEMESTERLY)

ELECTIVAS

ELECTIVES

Nutrición y Deporte	Nutrition and Sport
Marketing	Marketing
Seguridad Alimentaria Nutricional	Food and Nutritional Security