Characterization of Instrumental Sub-Competence in Cuban Medical Translators based on a New Model of this Competence

Tesis Presentada en Opción al Título Académico de Máster en Lengua Inglesa para la Comunicación Intercultural

Author: Alain Escarrá Jiménez, B. A.
Adviser: María del Carmen Navarrete, PhD.
Consultants: Manuel Llanes, B. A.
Ana Vivian Fernández, PhD.

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Thought

“Trust in the LORD with all your heart
and lean not on your own understanding;
in all your ways acknowledge him,
and he will make your paths straight”

The Bible. Proverbs 3: 5-6
Dedication

To my family and all those who somehow helped me throughout this project.

Thank you very much!
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Abstract

The arrival of the information era has changed many things. The translation profession has also undergone significant changes. Now, in order to be a competent translator it is a must to be computer literate and to keep one’s information technologies skills updated.

The overall aim of this research was to characterize the current condition of instrumental competence among Cuban medical translators. For this purpose a new model of instrumental competence is proposed. Different theoretical and empirical methods were used and the research followed four stages: review of selected research literature, proposal of a new model of Instrumental Competence, data collection and data analysis and findings.

This research has both theoretical and practical contributions. The proposal of a new and comprehensive model of instrumental competence adds to the current theory in this field. And the practicality is given by the fact that the results of this research may help to consider new approaches in undergraduate and postgraduate translation courses with respect to the development of this competence. At the end, some recommendations are made to both professors in charge of designing the curricula of translation courses and to the medical translator community.

**Key words:** Translation competence, Instrumental sub-competence, Medical translation, Documentary competence, Information and communication technologies.
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Introduction:

A translator is a person who expresses in a language (generally in his mother tongue and in writing) what is written in another language. The function of translators is far more important of what it is believed. It has been said that some wars have broken due to an error of the interpreter. It is obvious then that translation is much more than just knowing two languages. There is something that distinguishes a bilingual person from a professional translator: translation competence.

Starting by Saint Jerome and his translation of the Bible to the Latin of the people (the Vulgate) in the 4th century, there have been very competent translators throughout history. The competence needed to translate has evolved due to different factors, mainly technological factors.

Translators have always been associated with the image of a man writing or typing behind a heap of dictionaries and with a bunch of books behind him. But in recent years this image has changed. Now when one thinks of a translator one can imagine a person behind a computer with Internet connection and maybe a couple of books on his desk. With the arrival of the information era many things changed. The translation profession has also changed. Now, in order to be a competent translator it is a must to be computer literate and to keep one’s information technologies skills updated.

This research is about translation competence and specifically the focus will be on one of the translation sub-competences: Instrumental sub-competence, which is predominantly procedural knowledge related to the use of documentation resources and information and communication technologies applied to translation (PACTE, 2011).

It is good to point out the importance of the concept and description of translation competence in the field of translation studies. Campbell (1998) offers three possible applications of the concept of translation competence in translation studies, which in turn determine the approach of the design work and resulting model: a) the development of psychological models of the translation process, b) the summative evaluation of the quality of translations products, instrument for professional accreditation; and c) the pedagogy of translation.
This research was conducted among Cuban medical translators. Most of these translators work at Medical Information Centers that are located throughout the country and others work for specific medical journals that are not necessarily part of Information Centers.

**Research question:** What is the current condition of instrumental competence in Cuban medical translators?

**Overall aim and objectives**

**Overall aim:**
To characterize instrumental sub-competence in Cuban medical translators.

**Objectives:**
- To review the theoretical foundations of the theories about translation competence.
- To choose a model of translation competence and a model of instrumental sub-competence.
- To propose a new model of instrumental sub-competence.
- To apply some empirical methods to the sample to gather the necessary data to characterize instrumental sub-competence based on our model.
- To assess the findings to arrive at the final conclusions about the current condition of instrumental competence in Cuban medical translators.

This work is structured in three chapters that are summarized as follows:

**Chapter 1: Literature Review.**

In this chapter the term competence is explored, and a general definition for our research is adopted. Then, the two more commonly quoted and, in our opinion, the most important definitions and models of Translation Competence are analyzed (those of PACTE Group and Dorothy Kelly). An analysis of a model on Instrumental Competence provided by Inna Kozlova (2005) is made. Finally, a general introduction to medical translation in Cuba is also provided.
Chapter II: Research Methodological Design

This chapter describes the methodology used to propose a new model of IC and to characterize this competence among Cuban medical translators. For this purpose, the research context and background, population and sample, different research stages and the methods used in each of them are explained.

Chapter III: Data Analysis and Findings

In this chapter, the two main findings of the present research are described. The first one is the proposal of a new model on Instrumental Competence (IC) and the second is the characterization of this competence among Cuban Medical translators.

Regarding the significance of the research it has both theoretical and practical contributions.

1. Theoretical contribution: The proposal of a new and comprehensive model of instrumental competence that includes both documentary competence and use of general and specific ICTs applied to translation.

2. Practical contribution: In our research, the current status of instrumental competence among Cuban medical translators is characterized. In our information era the information and technological advances have given a turn to the translation profession worldwide and these advances call for new competences on the part of translators, mainly instrumental competences. The results of this research may help to consider new approaches in undergraduate and postgraduate translation courses with respect to this competence.
Chapter I. LITERATURE REVIEW

1. Introduction to the chapter

In this chapter the term competence will be explored, and although there are many different approaches and definitions regarding this concept, a general one will be adopted. Then, the term translation competence (TC) will be studied in more details, analyzing the two more commonly quoted and, in our opinion, the most important definitions and models of TC. Those are the definitions and models proposed by the PACTE Group (Process of Acquisition of Translation Competence and Evaluation) and by Dorothy Kelly. A comparison of their models is made and an explanation is given for our adoption of PACTE’s model for working in our research. Then, an analysis of a model on Instrumental Competence provided by Inna Kozlova (2005) is made. Finally, a general introduction to medical translation in Cuba is also made.

1.1. Concept of Competence

As Sevillano (2010) mentions, “the word competence comes from the Greek word *agón*, which originated “*agonistes*”, a person that competed in the Olympic games with the purpose of winning”. (Sevillano, 2010: 2).

Enrique Cejas (2006) in his work “Un análisis de la definición de competencia laboral” states that the term competence is approached from different angles: business, psychological and curricular points of view. Some authors consider the concept as a capacity, others as a group of attributes (knowledge, attitudes, abilities, and values), others as ability, and still others as a system of attributes. So, due to these different approaches there are several different definitions for the term competence, which in turn, are being used in different fields, such as labor, business, education, linguistics and translation fields.

Let us start by analyzing labor competence and although there are also many definitions, CINTERFOR (2011) points out that a widely accepted concept defines it as the effective ability to perform a fully identified labor activity successfully. Labor competence is not the possibility of success at a job; it is a real and proved ability.

A good categorization of competence, which allows to access definitions in a better way, is the one that distinguishes between three approaches. The first one regards
competence as the ability to carry out tasks; the second one concentrates on personal attributes (attitudes, abilities) and the third one, called “holistic”, includes the two previous ones.

Chomsky (1965, quoted by Fraihat and Mahadi, 2011) reveals that linguistic competence is the perfect knowledge of an ideal user of the language in a homogeneous speech community. His eminent distinction between competence (the speaker-listener’s knowledge of language) and performance (the actual use of language knowledge in real life situations) arouses the interests of many scholars to find out what are the parameters of this perfect knowledge (competence).

Korossy (1993, quoted by Dietrich and Rainer, 1997) working on the theory of knowledge structures also separates competence and performance but from a more general perspective. For him, competence means skills or abilities that enable a person to solve a problem, and cannot be observed directly, whereas performance is the behavior, e.g. the answer that is given, and can be observed.

Competences have also been the subject of debate at the United Nations, especially in the reforms that took place in this organization in the 1990s. In fact, Kofi Annan defined competence as: “A combination of skills, attributes and behaviors that are directly related to successful performance on the job”. He also made a classification of core and managerial competences. According to him “Core competences are the skills, attributes and behaviors which are considered for all staff of the Organization, regardless of their function or level” and “Managerial competencies are the skills, attributes and behaviors which are considered essential for staff with managerial or supervisory responsibilities”.

(Annan, 1999: 6)

In our research, we adopt the definition given by by Gairín et al. (2009) that define competence as “the combination of abilities, attitudes and knowledge required to carry out a task in an efficient way”. This definition is both precise and comprehensive and can be applied to all fields in which the term competence is used.
1.2 Classification of Competences

In a research project done by Fernando Vargas (2000), consultant of CINTERFOR (Centro Interamericano de Investigación y Documentación sobre Formación Profesional), competences are classified as follows:

1. **General competences**: Those acquired as a result of basic education. It has to do with the abilities for reading, writing, oral communication, basic mathematics. (Basic Skills in the U.S.A, Core Skills in UK, Key Competences en Australia).

2. **Generic competences**: They have to do with labor behavior, characteristic of performances in different fields or activities, and they are usually related with the interaction with technologies of general use. (Core Behaviors in the U.S.A, Generic Units in UK. and Cross Industry Standards in Australia).

3. **Specific competences**: Those directly related with the exercise of specific occupations, and due to their technological characteristics, they are not easily transferred from one field to another. This is the case of the operation of numerical control machinery, the checking up of patients, and the elaboration of financial statements. (Industry Specific Standards in UK y Australia).

It is in this third classification that translation competence falls. However, it is interesting to note that other authors include communication, problem-solving, team work, decision-making, and creative thinking skills as well as aptitude for continuous formation within generic competences. Descy and Tessaring (2002, quoted by Koznova 2005:224) say that countries of the European Union seek to foster these generic competences because they guarantee a greater adaptability of the worker to his/her job, and at the same time their capacity to acquire new specific competences improves.

1.3 Translation Competence

We think it is good to briefly examine the usefulness of the concept and description of translation competence in the field of translation studies. Campbell (1998, quoted by Kelly 2005) offers three possible applications of the concept of translation competence in translation studies, which in turn determine the approach of the design work and resulting model: a) the development of psychological models of the translation process,
b) the summative evaluation of the quality of translations products (Campbell is very critical to the work that has been done from this perspective), instrument for professional accreditation; and c) the pedagogy of translation.

Ezpeleta (2005, quoted by Montalt et al., 2008) says that translation competence is a complex concept and many authors in the field of Translation Studies have addressed it. This author also states:

“Reflection on the matter is a relatively recent development and results from empirical studies are still scarce. Some authors talk of translation abilities or skills (Lowe, 1987; Pym, 1992; Hatim and Mason, 1997) while others refer to translation performance (Wilss, 1989). The term competence - translational competence - was first used by Toury (1980, 1995), because of its similarity to Chomsky's (1965) famous distinction between linguistic competence and performance, to explore certain aspects of translation practice. Nord (1991) employs transfer competence and Chesterman (1997) called it translational competence” (Ezpeleta, 2005: 136).

Montalt et al. (2008) point out that in recent years the concept of translation competence has steadily gained acceptance up to the point where it has now become the most widely discussed issue in relation to translator training. Proof of this can be seen, for example, in the work carried out by the PACTE group (2011) or that of Kelly (2002, 2005, 2006).

In her work “Un modelo de competencia traductora: bases para el diseño curricular” Kelly (2002) stated that it is interesting to point out that few works define translation competence as the main theme of research since most of the models are given as a previous step in the analysis of other matters, often related with the formation of translators.

As Orozco and Hurtado Albir pointed out regarding this topic:

is obvious that these authors have a definition of translation competence in mind, but they do not make it explicit.” (Hurtado and Orozco, 2002: 376)

These authors mention four definitions of translation competence. Wilss says translation competence calls for “an interlingual supercompetence [...] based on a comprehensive knowledge of the respective SL and TL, including the text-pragmatic dimension, and consists of the ability to integrate the two monolingual competencies on a higher level” Wills, 1982: 58). Bell defines translation competence as “the knowledge and skills the translator must possess in order to carry out a translation” (Bell, 1991:43); Hurtado Albir defines it as “the ability of knowing how to translate” (Hurtado Albir, 1996: 48). The fourth definition is that of PACTE research group (Process of the Acquisition of Translation Competence and Evaluation). They define translation competence as the underlying system of knowledge required to translate (PACTE, 2011).

After conducting a careful review of the most cited concepts and models on translation competence, it has been observed that those proposed by PACTE (coordinated by Amparo Albir, from Universidad Autónoma de Barcelona) and Kelly are currently the most used ones.

1.3.1 PACTE’s concept and model on TC

As stated above, PACTE stands for Process of the Acquisition of Translation Competence and Evaluation, and it is supervised by Dr. Amparo Hurtado, from Universidad Autónoma de Barcelona.

PACTE defines translation competence as the underlying system of knowledge required to translate (PACTE, 2011). Ezpeleta et al. (2005) explain that this group proposes a model of translation competence which has four distinguishing features: a) It is expert knowledge; (b) it is predominantly procedural knowledge, i.e. non-declarative; (c) it comprises different inter-related sub-competences; and (d) it includes a strategic component which is of particular importance.

The Translation Competence holistic model proposed by this research team is made up of 5 sub-competences and psycho-physiological components that overlap each other as they operate.
The bilingual sub-competence consists of the underlying systems of knowledge and skills that are needed for linguistic communication to take place in two languages. It is made up of comprehension and production competencies, and includes the following knowledge and skills: grammatical competence; textual competence (which consists in being proficient in combining linguistic forms to produce a written or oral text in different genres or text types); illocutionary competence (related to the functions of language); and socio-linguistic competence (concerned with appropriate production and comprehension in a range of socio-linguistic contexts that depend on factors such as the status of the participants, the purpose of the interaction, the norms or conventions at play in the interaction, and so forth).

The extra-linguistic sub-competence is predominantly declarative knowledge, both implicit and explicit, about the world in general and special areas. It includes: bicultural knowledge (about the source and target cultures), encyclopedic knowledge (about the world in general) and subject knowledge (in special areas).

The translation knowledge sub-competence is knowledge of the principles guiding translation, such as processes, methods, procedures, and so forth.
The instrumental sub-competence comprises the knowledge required to work as a professional translator, such as the use of sources of documentation and information technologies applied to translation.

The strategic sub-competence integrates all the others and is the most important, since it allows problems to be solved and ensures the efficiency of the process. It consists in the capacity to follow the transfer process from the source text to the production of the final target text, according to the purpose of the translation and the characteristics of the target audience (Hurtado, 2001: 395-397; PACTE, 2005: 611, quoted by Ezpeleta et al., 2005).

It intervenes by planning the process in relation to the translation project, evaluating the process and partial results obtained, activating the different sub-competencies and compensating for deficiencies, identifying translation problems and applying procedures to solve them.

The psycho-physiological components are cognitive and behavioral (memory, attention span, perseverance, critical mind, etc.) and psychomotor mechanisms.

PACTE’s model differs from previous approaches mainly due to the emphasis they put on procedural aspect, regarding TC as “expert knowledge in which procedural knowledge is predominant” (PACTE 2003: 59).

1.3.2. Kelly’s concept and model on TC

Dorothy Kelly from Granada University proposes the following concept of TC:

“Translation competence is the macrocompetence that comprises the different capacities, skills, knowledge and even attitudes that professional translators possess and which are involved in translation as an expert activity. It can be broken down into the following sub-competencies, which are all necessary for the success of the macrocompetence.” (Kelly, 2005:14)

These sub-competences are:

- Textual and communicative sub-competence
- Cultural and intercultural sub-competence
- Thematic sub-competence
- Professional and instrumental sub-competence
- Interpersonal sub-competence
- Psycho-physiological sub-competence.
- Strategic sub-competence

Now, each of them will be analyzed in details.

**- Textual and communicative sub-competence** in at least two languages and cultures. It means both active and passive skills in the two languages involved, together with knowledge of textual and discursive conventions in the cultures involved. This competence became more important when Höning and Küßmaul (1982) and Nord (1992) described translation as a communicative act.

**- Cultural and intercultural sub-competence**
The word culture refers not only to the encyclopedic knowledge of history, geography, institutions, etc. of the cultures involved but more specifically to the myths, standards, beliefs and perceptions in their textual representation. When translating, these intercultural communication issues are of great importance.

**- Thematic sub-competence**
It involves basic knowledge about the thematic fields in which a translator works. This knowledge allows him/her to understand the source text or the additional documentation they use.

**- Professional and instrumental competence**
Use of documentary resources of all kinds, terminological research, information management and use of tools for professional practice, such as Internet, email, etc. are important in this competence. Today students already know how to use Internet and email and that is why the description of this competence has changed and also because there is now software to facilitate the work of the translator. For example, the Trados software specializes in terminology management and translation memories. Using this type of program has to be part of the translator instrumental competence (Kelly, 2005). For this reason it seems logical that the use of such programs also plays a role in the
training of translators. It also has to do with basic knowledge for the practice of the profession (contracts, tax duties, estimates and invoicing, etc.), as well as professional ethics and association.

- **Psycho-physiological sub-competence**: It has to do with the self-concept or awareness of being a translator, self-confidence, attention spam, memory, etc.

- **Interpersonal sub-competence**
  It is the ability to interrelate and work with other professionals involved in the translation process, not only translators and professionals in the field (reviewers, documentalists, terminologists) but also with clients, authors, users, as well as experts in the theme of the translation.

- **Strategic sub-competence**: It has to do with all the procedures applied to the organization and accomplishment of the work, to the identification and resolution of problems, self-evaluation and revision.
**Fig. 2** Kelly’s proposal for Translation Competence

### 1.3.3. Comparison of Models

Some of the sub-competences mentioned by Kelly are included, under a different name, in PACTE’s model. For example, the textual and communicative sub-competence comprises the bilingual sub-competence of PACTE, the cultural and intercultural sub-competence and the thematic sub-competences equal the extra-linguistic sub-competence. The strategic sub-competence is in both models the most important sub-competence. Kelly (2005) considers the psycho-physiological as a sub-competence; PACTE, however, considers they are components that support the translation process and not a sub-competence as such. It is the interpersonal sub-competence of Kelly’s that does not seem to fall into any of PACTE’s categories.
Regarding instrumental competence, it is interesting to note that Kelly and PACTE differ in some ways. Kelly adds the term *professional*, which, in her own words has to do with: “basic knowledge for the practice of the profession (contracts, tax duties, estimates and invoicing, etc.), as well as professional ethics and association” (2005). The professional competence that Kelly proposes does not apply to our context in Cuba, as it is something very far from our professional practice, mainly in the field of medical translation. For this reason we have chosen to work with PACTE’s model, as it takes instrumental sub-competence in isolation.

1.4 Instrumental Competence

Up to now we have mentioned the term “instrumental sub-competence”, as it falls within a more comprehensive concept that is translation competence. However, from now on, most of the times we will refer to it as instrumental competence (IC) as for the purposes of this research it will be analyzed in isolation.

As defined by PACTE (2011), instrumental sub-competence comprises the knowledge required to work as a professional translator, such as the use of sources of documentation and information technologies applied to translation. That is to say, when considering this competence there are two elements that have to be analyzed: a) use of sources of documentation (documentary competence, as it is most commonly called) and b) command of ICTs applied to translation.

Most works revised on this topic make emphasis in one of these two elements of instrumental competence. For this reason they will be analyzed in separate sections of this chapter.

1.5 First element of IC: Documentary Competence

Translation work is to a great extent a problem of documentation (Roberto Mayoral, 1994). Translators’ information competence—also referred to as “documentary competence”, “research competence” or “instrumental competence” in the translation studies literature—is typically situated within multidimensional notions of translation competence (Enríquez Raído, 2011).

In the work “Competencia Documental Como Parte de la Macro Competencia Traductora”, also known as the ALFINTRA / INFOLTRANS Proposal carried out by...
Pinto and Sales (2008), an emphasis in the documentary competence as part of the translator (macro) competence is made. In the conclusions they state the following:

1. In summary, documentary competence is essential in the translation practice, and thus, in the (continuous) formation of those who translate. The documentary activity is an essential instrumental link in the mediation and knowledge transfer process that is translation, as an indispensable part of the translational "know-how".

2. He who translates has the challenge and responsibility to know and use the many current opportunities of information search, retrieval, processing and dissemination, and at the same time, to deal with the new and surprising tools that information technologies and telecommunications make available to them, for development of their work; and all this from a proven and quality perspective.

3. Namely, the translator has the challenge of finding the data, the source of information, and the responsibility to know how to use them. (Pinto and Sales, 2008: 21)

An outstanding work on documentary competence is the doctoral thesis “Competencia Instrumental para la Reproducción textual en lengua extranjera: procesos de consulta léxica en fuentes externas” by Inna Kozlova (2005). The author approaches instrumental competence, not only from the traductological point of view, but also from the text production perspective. As this author states, the command of the consultation process of resources is a key element of instrumental competence. Konzlova acknowledges that most of the current studies on IC are based on tools for the use of the translator, especially those that include the use of new technologies. However, she bases her research on a more generalized approach, applicable to any kind of resource, and even though knowledge and use of resources by the individual is included, an additional emphasis on the interaction process between the individual and the resource is made.

In the first chapter of this work, the author analyzes the representation and knowledge processing in the human memory, making special emphasis on the information retrieval processes since she states that the processes that occur in human memory are very similar to the ones that occur when we make search on external sources of information.
In the second chapter, Kozlova deals with the representation of knowledge in external resources. According to her, resources are a universal extension of human memory and their main function is to complete the information that is missing in the user’s memory, so he/she can solve certain problems in the comprehension or production of a text. She offers a comprehensive classification of general resources, dividing them into three categories: reference works, auxiliary texts and databases.

Reference works are understood as “works whose main objective is to serve for the resolution of any kind of doubt or for the localization or verification of any kind of data” (Martínez de Sousa 1999: 42, quoted by Kozlova 2005: 67, translated by the researcher). Regarding the typology of reference works, McArthur (1986:158, quoted by Kozlova) explains they can be divided according to the content (linguistic or encyclopedic) and to the kind of access to the information (alphabetic or thematic). This double characterization of reference works allows us to choose the right resource for the consultation process. Dictionaries (monolingual, bilingual and specialized), encyclopedias and manuals are included in this category.

Auxiliary texts are primary sources, created in a specific context with specific purposes, and they are not conceived for linguistic consultation. This is the main difference between reference works and auxiliary texts. Kozlova classifies auxiliary texts in: parallel texts, hypertext, and corpora.

The third category consists of databases in digital format. These are document collections as such, organized according to a given criterion. Their function is the storage and retrieval of information. It includes: databases for the localization of texts (library catalogues and internet search engines), computer-assisted translation programs, text processing programs, on-line and CD-ROM dictionaries, term bases and integrated resources.

1.6 Second element of IC: information and communications technologies (ICTs) applied to translation

1.6.1 History of computers applied to machine translation (MT) and translation memory systems (TMS)
According to Nirenburg (2003) before the advent of the digital computer, building a machine to translate among human languages was more or less in the realm of science fiction, though this did not stop the Soviet engineer Petr Smirnov-Trojanskij from patenting, in 1933, a mechanical device for, essentially, storing and using multilingual dictionaries or from continuing for more than 15 years to work on mechanical translation on the basis of this device. In this sense, this engineer can be considered a pioneer of MT.

Schwartz, (n.d) argues that in the year 1940 at Bell Labs, the Complex Number Calculator was tested and then demonstrated. This is thought to have been the first digital (pulse wave rather than analogue wave run) computer. According to Newton (1992) the electronic digital computer made its first impact in the Second World War. In the immediate post-War period, there was a natural move to explore its potential capabilities, and the translation of languages was soon identified as one of the obvious candidates for exploitation.

For example, A. D. Booth during the summer of 1947 suggested that “a digital computer having adequate memory facilities could perform the operations necessary to translate a text written in a foreign language (FL) into the desired language or target language (TL)” (Nirenburg, 1993: 18). However, these early explorations were given a vital encouragement by the famous Weaver memorandum, which “in effect…launched machine translation…in the United States and subsequently elsewhere”. (Hutchins, 1986, quoted by Newton, 1992: 15). This memorandum sparked off a wave of interest not only in the United States but also across the Atlantic in Britain.

Newton (1992) explains that:

From 1956 onwards, activity in MT flourished in many different parts of the world. In the United States, it was given increasingly substantial financial support from the government and from military and private sources. In 1966, however, the bubble burst, with the publication of the Automatic Language Processing Advisory Committee (ALPAC) report (ALPAC 1966) which recommended the cessation of all MT funding. The mood had changed from enthusiastic optimism to fatalistic condemnation in less than a decade. (Newton, 1992: 16)
Analyzing the real causes of this temporary failure it can be concluded that the original association of MT with cryptography was very largely responsible for the adoption of over-simplistic techniques that ultimately proved flawed and led, eventually, to the ALPAC condemnation. Another reason was the marked limitations in computer hardware in comparison with the existing ideas for MT (software).

In the meantime computer technology continued to evolve and some of the problems that MT faced such as the construction of large memories, access to large data bases by hash-code like techniques and a variety of models of natural language, and parsing algorithms, were developed.

Evidence of the close relationship of computer technology evolution, mainly in the sense of hardware developments and the advances in MT is that according to Schwartz, (n.d) in 1971 the Intel Corporation released the 1st microprocessor (the Intel 4004.) and it precisely this decade is considered the infancy stage for Translation Memory Systems (TMS), a process more complex than MT.

However, it was not until the PC as we know it today was created by IBM and released during 1981 that the real exploratory stage of TMS was undertaken. Apple introduced its PC alternative, the Macintosh, during 1984.

The World Wide Web was developed by Tim Lee in 1991, and CERN also created the 1st Web Server. The Pentium chip was included in PCs for the first time in 1993 signalling the end for the 486. There is officially World Internet Connectivity as of 6/15/95. Parallel to these events, TM technology became commercially available on a wide scale in the late 1990s.

As it has been briefly described computer technology development has been closely related to the development of MT and TM systems. The overcoming of technological obstacles (mainly hardware obstacles) has allowed great advances in this field.

1.6.2 ICTs and Translation

There is a wide range of information and communications technologies available to translators today, including both general tools and specific tools. For the effects of this investigation ICTs are defined “as a group of information and communication technological applications, both general and specific, traditional or advanced that are
especially useful for the professional translator” (Diéguez and Lazo 2004: 54). These authors state that among the general applications or tools, we have the Internet, the use of corpora and concordance generator programs as the most important ones. Among the specific ICTs for the translator we have automatic translation (AT), and computer assisted translation (CAT) including translation memories. Next, we summarize some of their views on this topic and we also add some ideas.

1.6.3 General ICTs for translators

1.6.3.1 The Internet

The services offered by the Internet provide the professional translator with considerable advantages in the documentation task as it allows him/her to access to a huge quantity of data and publications, as well as to communicate with experts and translators in other parts of the world with the purpose of exchanging ideas and experiences. In our opinion one of the most important tools offered by the Internet are the search and location information engines. At present, the three leading search engines are Google; Yahoo!, operated by Yahoo! Inc. of Sunnyvale, Calif.; and Microsoft's Bing (formerly Live Search), operated by Microsoft Corporation of Redmond, Wash. They allow to access in a few seconds to an enormous quantity of interrelated information.

1.6.3.2 The use of corpus linguistics

This is another tool that can be of great help for the professional translator. Corpora are classified in two types. On one hand, the monolingual corpora, for example CREA (Corpus de Referencia del Español Actual) of the Real Academia de la Lengua Española. On the other hand, we have the bilingual corpora that can, in turn, be divided in parallel corpus and comparable corpus. The former is made up of a group of source texts and their respective translations. The best example of this is the Canadian Hansards. The latter are texts originally written in two or more languages.

1.6.3.3 Concordance generator programs

A third example of general ICTs is the concordance generator programs, which can find all the times that a certain word or phrase appears in a text or in several texts written in electronic format. It can also show a list of the context in which they appear.

1.6.4 Specific ICTs for translators.
1.6.4.1 Machine translation (MT) or Automatic Translation

As it was very accurately explained in Wikipedia (2012), machine translation is a procedure whereby a computer program analyzes a source text and produces a target text *without further human intervention*. In reality, however, machine translation typically *does* involve human intervention, in the form of pre-editing and post-editing.

1.6.4.2 Computer-assisted translation (CAT)

Computer-assisted translation (CAT), also called "computer-aided translation," "machine-aided human translation (MAHT)" and "interactive translation," is a form of translation wherein a human translator creates a target text with the assistance of a computer program. The machine supports a human translator.

Computer-assisted translation can include standard dictionary and grammar software. The term, however, normally refers to a range of specialized programs available to the translator, including translation-memory, terminology-management, concordance, and alignment programs.

1.7 Use of translation tools

According to Raído and Austermühl (2003), effective use of translation technology starts from the translator's point of view. The translator has to determine what types of translation technology are needed at what stages of the translation process in order to optimize his or her professional performance.

These authors also state that within each of the three main phases of the translation process -- reception, transfer, and formulation -- different sub-competencies are demanded by translators, and the tools used to support them have to offer specific features and contents.

During the reception phase, a translator can use electronic encyclopedias, digital knowledge databases or information retrieval systems or can contact domain experts through online newsgroups or mailing lists in order to retrieve missing background knowledge, allowing him or her to combine text, domain, and world knowledge to fully understand the content of the source text.
The transfer phase, i.e. the adaptation of the source text information to the context of the target text culture is uniquely translational. Neither readers nor writers share this phase with the translator. It requires deep cross-cultural understanding and strong intercultural communication skills. The tools needed during this stage of the translation process need to offer a high degree of intercultural knowledge, while at the same time providing the translator with a comparative analysis of the cultures affected by the translation project. Resources in this field are still rare and special kinds of translator dictionaries or culturally-sensitive terminology databases providing a thorough combination and networking of linguistic, encyclopedic and intercultural knowledge have to be designed to assist translators during the transfer phase.

Finally, the formulation phase confronts the translator with challenges regarding the production of the target language text. Here again, the use of dictionaries and terminology databases can assist the translator quite efficiently. The information contained in those resources needs to offer support especially with regard to the syntagmatic relations of terms, as can be found in many style guides or in collocation dictionaries. Dictionaries providing such information become valuable production dictionaries. In addition, the translator can turn to text archives available on CD-ROM or over the Internet for the verification of tentative translation solutions in the target language…(Raído and Austermühl 2003: 7)

The increasing importance of technological advances in relation with the translation profession has given birth to a new subject within traductology: Tradumatics (Translation and New Technologies). This started with a group of researchers from Universidad Autónoma de Barcelona, with Dr. Pilar Sánchez-Gijón as the head researcher. Later on, the neologism “tradumatics” was adopted to refer to this area of research.

1.8 A model of instrumental competence

In her doctoral dissertation “Competencia Instrumental para la Reproducción textual en lengua extranjera: procesos de consulta léxica en fuentes externas”, Inna Kozlova (2005) offers a model of Instrumental Competence (IC) and also deals with its
development. This is the only model on IC found in the available literature. This model is a step forward in the field of translation competence studies, specifically in the analysis and description of instrumental sub-competence.

**Fig. 3 Kozlova’s Model of Instrumental Competence**

**1.8.1 Analysis of the model:**

According to Kozlova, the main two divisions of IC are: knowledge of resources and command of consultation procedures, and each of these divisions have two main subdivisions, a general one which is applicable to any kind of resources and a specific one for specific resources.

For this author, knowledge of resources includes:

a) A general knowledge of the variety of resources, their possible contents and kinds of access.
b) The knowledge of specific resources.

On the other hand, knowledge of consultation procedures includes:

a) Command of consultation procedures in general;

b) Command of consultation procedures in specific resources.

The author refers to a theoretical description of general resources, which we have already mentioned above, although she admits it is impossible to deal with the topic of resources and technology without mentioning specific resources. Kozlova also explains she is more interested in the command of consultation procedures which she also calls “consultation competence”. Therefore, the author proposes a model for the consultation process, which is applicable to any kind of resource. She states that this model makes reference to the general command of consultation procedures and thus it allows the development of more specific professional abilities which consists of the command of consultation procedures in specific resources.

The model is the following:

| 1. Identification of the problem based on the task |
| 2. Formulation of search criteria (what do I want to find) |
| 3. Formulation of an access key (what do I have) |
| 4. Application of the key to get to the information |
| 5. Application of the search criteria and identification of candidates |
| 6. Evaluation of candidates based on the task |

![Fig. 4 General command of consultation procedures](image)

1.8.2 Brief Comments on Kozlova’s work and IC model

“Competencia Instrumental para la Reproducción textual en lengua extranjera: procesos de consulta léxica en fuentes externas” is an outstanding scientific piece of work in which the author Inna Kozlova makes several contributions to the field of translation studies, mainly regarding instrumental competence. However, we have found two main problems that we state below.
The first problem is that she does not include people as a kind of external resource that can be used by translators in their daily work. In our view, this inclusion could be one of the greatest contributions of the present research.

The second problem is that as her main research focus is consultation competence or documentary competence, she does not analyze the role of ICTs as part of IC. Therefore, ICTs are not explicitly included in her model of IC.

In the chapter 3, some modifications to this model will be presented. In this new model these two categories: knowledge of resources and command of consultation procedures will be united in only one concept, documentary competence. Also, a new classification of resources will be proposed, as well as a new classification of command of consultation procedures. Finally, a second main aspect will be added, namely knowledge and use of specific ICTs applied to translation.

1.9 Medical Translation in Cuba.

Medical Information Centers are found in all provinces and in many municipalities of Cuba. These centers have the mission of offering updated information to all professionals of medical sciences and also to train these professional in the search and retrieval of information or what is called “Information Literacy”. The Information National Center of Medical Sciences (Infomed) is located in Havana and leads this work nationwide.

In these information centers there is at least one translator whose mission is to translate medical information according to the needs of health professionals. They also translate summaries and whole articles for authors who want to publish their works in international medical journals and offer English courses for the personnel of the information centers, etc. The National Directory of Medical Translators shows a total of 25 translators from different provinces who work with 6 languages: English, German, Portuguese, French, Russian and Spanish.

There are also translators that are not part of information centers but who work for specific medical journals. For example, in our province Villa Clara, there are four of these journals: Acta Medica (Arnaldo Milián Castro Provincial Hospital), Edumecentro
and Medicentro (José Raúl Ruíz de Zárate Ruíz Medical University) and CorSalud (Cardiocentro Ernesto Che Guevara).

As it is well known, English is nowadays the lingua franca for the spreading of scientific knowledge. Many authors in different parts of the world publish in this language as they want their works to be known. In fact, the journals with the highest impact factor are published in English. For this reason, translation (in this case inverse translation) is a key step in the spreading of the research and results of the Cuban health scientists and professionals.

Due to the importance and difficulty of medical translation, medical translators should develop certain competences that will allow him/her to offer quality translation in this difficult field, especially Instrumental competence that includes both documentary competence and the use of ICTs (both general and specific) applied to translation.

This means that medical translators should develop the competence to determine in each moment what information do they need and where and how to look for it in the immense variety of resources available at present. Also, they need to develop skills to use the general ICTs that support the translator in his/her work, as well as those specific ICTs that have given a turn to translation: automatic translation and computed-assisted translation (CAT).
Chapter II. Research Methodological Design

2.0 Introduction to the chapter

This chapter aims at describing the methodology used to propose a new model of IC and to characterize this competence among Cuban medical translators. For this purpose, the research context and background, population and sample, different research stages and the methods used in each of them are explained.

2.1 Research context

This research was conducted among Cuban medical translators. Most of these translators work at Medical Information Centers which are located throughout the country and others work for specific medical journals that are not necessarily part of Information Centers.

The mission of such centers and that of translators was described at the end of last chapter. The National Directory of Medical Translators shows a total of 25 translators who work in different provinces with 6 languages. This Directory includes translators of medical journals.

2.2 Research background

At Villa Clara Provincial Medical Information Center, there was a Translation Department with a staff of 7 translators who worked with 5 different languages: English, German, Russian, French and Spanish. The researcher worked in such department from 2005 to 2011 doing direct and inverse translation in the combination English - Spanish.

In 2008, two members of the department and the researcher had the opportunity to attend the World Congress of Specialized Translation that took place in Havana. There, for the first time we heard about the importance of documentation competence for translation, the use of translation memories and other CAT tools, among other themes. In other words, instrumental competence seemed to be of paramount importance for translators in the 21st century, and this competence, in our information era, have dramatically changed.
During next years the researcher began to study these topics and observed, in the translation department where he worked, a poorly developed IC among its members and, what is more, a resistance to learn about these trends and needs in translation practice.

Was this a problem only in our translation department or was it also a generalized problem in Cuba? Was instrumental competence so poorly developed among medical translators nationwide? These were some of the questions that led the researcher to conduct this research.

2.3 Population and sample

The population of this research consisted of 20 translators. Even though the National Directory of Medical Translators shows a total of 25 (which is not currently updated), five of them work with languages other than English (Annex 1).

The function or mission of these translators varies according to their specific positions (the functions of those who work at Information Centers are somewhat different from those who translate for medical journals) and the characteristics of their workplace. However, their overall functions are:

- Translating scientific written texts from one or more foreign languages into the mother tongue or vice versa.
- Interpreting for participants in meetings, interviews, lectures, etc.
- Translating summaries and whole articles for authors who want to publish their works in international medical journals.
- Translating titles, summaries or whole articles for specific medical journals.
- Sight Translation
- Working in the making up of glossaries of medical terminology in both languages

**Inclusion criteria:**

- Active translators of the Cuban National Health System
- Language combination: English < > Spanish (direct and inverse translation)
- Be willing to take part in the research

**Exclusion criteria:**

- Not showing interest or willingness in taking part in the research
- Not being active translators (retired or on leave for different reasons)

All 20 possible participants were contacted and asked if they were willing to be part of the research. 14 of them answered positively.

**Sample:**

The sample was made up of 14 translators who met the inclusion criteria.

The following map shows their distribution and number:

![Map of Cuba showing distribution of translators](image)

**Fig. 5** Distribution of translators in the sample

**2.4 Methodology and stages of research**

The methodology corresponds to both qualitative and quantitative paradigms, and in order to characterize instrumental competence among Cuban Medical translators four stages were followed.

1. **Review of selected research literature**
2. **Proposal of a new model on Instrumental Competence**
3. **Data collection**
4. Data analysis and findings

The first stage was a thorough literature review. The first element analyzed was the term competence, then translation competence and finally instrumental competence (IC). This has already been detailed in Chapter 1.

In the efforts to find a clear description of what IC really comprised, it was possible to find only one model of IC, which is the one developed by Inna Kozlova (2005), although from our perspective had some limitations. This meant that we found a problem which had not been foreseen at the beginning of the research: the lack of a detailed model on IC that would take into account both elements of this concept, i.e. use of documentation resources and use of ICTs applied to translation (PACTE, 2011) and that would serve as the basis for the development of a survey.

This problem led us to the second stage of our research: proposal of a new model on IC.

The other two stages were carried out uneventfully. For example, data about IC were collected through three methods: Analysis of documents, participant observation and a survey. In the fourth stage, data were analyzed and triangulation was used to get to the final conclusions.

2.4.1 Theoretical methods

- **Historical–logical**

According to de Armas and Valle (2011), the historical consists on seeing the object in its changing development and reflecting its qualitative nature which reflects the socially established knowledge. The logical emerges as a reflection of the historical content where the essential elements are repeated and secondary and causal elements present in the object’s history (but not necessarily in all moments of development) are discarded. That is to say, it establishes the regularities and laws of the process through a system of abstractions where what is stable, necessary and universal in the objects is revealed.

This method was used to understand the different definitions that have been proposed on translation competence during the past and those most used nowadays. This method was also useful for understanding the evolution and present situation of instrumental competence in relation to the evolution of ICTs.
Analysis and synthesis

De Armas and Valle (2011) also state that analysis as a logical operation consists of breaking down the whole in its parts, in its multiple components and relationships; and synthesis consists of mentally establishing the union among these parts and determining their relationships. Both are based on abstraction and generalization.

The real basis for the need of using analytic/synthetic methods lies in the fact that the object has multiple elements that have to be specified (separated) and also integrated (synthetized, united). The object should be considered as a whole, but for that purpose it should be split into parts which are parts of the whole.

In our research this method played a key role in the creation of the new model on IC. Analysis was used to break down the many elements and sub-elements comprised in the concept of IC in order to understand their roles. Then, through synthesis all these elements were integrated in the whole in order to see their relationships with other elements.

Modeling

Importance of models and modeling as a scientific method

The Stanford Encyclopedia of Philosophy (2012) states that:

…models are of central importance in many scientific contexts. The centrality of models such as the billiard ball model of a gas, the Bohr model of the atom, the Lorenz model of the atmosphere, the double helix model of DNA, agent-based and evolutionary models in the social sciences, and general equilibrium models of markets in their respective domains are cases in point. Scientists spend a great deal of time building, testing, comparing and revising models, and much journal space is dedicated to introducing, applying and interpreting these valuable tools. In short, models are one of the principal instruments of modern science. (Frigg and Hartmann, 2012: 1).

In the second part of the book “Resultados científicos en la investigación educativa” written by de Armas and Valle (2011) they comprehensively deal with the theme of models and modeling methods, mainly from the pedagogical perspective. The following ideas have been summarized and translated by the researcher.
“Model” comes from Latin word “modulus” that means rhythm, magnitude, and it is related with the word “modus” which means copy, image.

The model and modeling, which is the process that is followed to get to the model, have reached such development that they are applied nowadays in different fields of science.

The development of modeling as a method for theoretical knowledge is related to James C. Maxwell, the founder of the Classic Theory of Electromagnetic Field. His works, during the mid XIX century, showed the great role of modeling in theoretical knowledge.

**Model**

There are different definitions for the word “model”. For example, Ariel Ruiz (2002) points out that it is the representation of the characteristics of some object in another, especially created to study it. It is the ideal configuration that represents a theory in a simplified form.

Pedro Zayas (2003) states that it is the material or theoretical representation of objects or phenomena, which allow us to break them down, abstract certain qualities, operate and test them.

A third definition and the one we adopt in our research is that of de Armas and Valle (2011), who says that a scientific model is an abstraction of those essential characteristics of the object of study, that allow discovering and studying new relationships and qualities of such object of study with the purpose of transforming reality. We have adopted this definition as it includes the two purposes for which models are made: to study the object and to transform the reality with which this object is related. Most definitions include only the first purpose.

**Modeling**

Modeling is a theoretical method used to discover and study new relationships and qualities in the object of study. It is carried out through a simplified representation of reality, as the models created are aimed to study this reality.

Modeling should be understood as a process, since it is “the systematic transformation of a phenomenon subject to laws” (Rosental and Ludin, 1973, quoted by de Armas and
Valle, 2011) and it is so because it starts from an analysis of reality upon which an abstraction is made. Then, this abstraction is materialized to obtain new knowledge of the reality under study in order to be able to transform this reality.

The concept of modeling, therefore, is a gnoseologic category that characterizes one of the most important ways of knowledge acquisition.

Scientists create different kinds of models, according to their objectives and the characteristics of the object of study. According to Fiallo, 2003, quoted by de Armas and Valle, 2011, models can be classified as Iconic, Analogical and Theoretical.

**Ionic Model:** It is a real-scaled representation of the object. The model shows the same shape, proportions, and characteristics of the original object. For example, a scale model of a classroom or a school can be made. These models can even undergo certain transformations to study how functional these facilities are.

**Analogical Model:** It is not a detailed reproduction of all qualities of the real system, but only reflects the structure of relationships and certain fundamental properties of reality. An analogy between the real system and the model is established, the former is studied using the latter as an auxiliary mean. For example, in Psychology, the learning conduct of animals has served as an analogical model to study the laws of human learning.

**Theoretical Model:** This model uses symbols to designate the properties of the real system to be studied. It has the capacity of representing the main characteristics and relationships of the phenomenon, provides explanations and serves as a guide for generating theoretical hypotheses.

As the main objective of our investigation was to characterize IC in Cuban medical translators, it was necessary to find a model that could help to better understand the concept of IC and the relationships between its main elements. In the reviewed literature only one model of IC has been found and it was that of Inna Kolzova (2005), which had some flaws that were introduced in chapter 1 and will be analyzed in details in chapter 3. This situation led us to propose a new theoretical model which will be also explained in chapter 3.
2.4.2 Empirical methods

- Analysis of documents

This method was applied to analyze the general and specific functions of translators of the National Health System, as well as the requirements to work as a translator. It has already been said that the functions of translators who work at Information Centers are somewhat different from those who translate for medical journals.

These documents were obtained at the Villa Clara Medical Information Center, specifically at the Personnel Department. (Annexes 2 and 3)

The document which explains the mission of the National Translation Department was also analyzed. (Annex 4)

- Participant observation

Observation is an empirical method to obtain primary information about the objects under research and a basic form of information gathering; it also stimulates curiosity and drives new discoveries (de Armas and Valle, 2011). Taking into consideration the role of the researcher this method can be classified in participant or non-participant observation. It is participant when the observer is part of the group and registers its actions. It is non-participant when the observer is not part of the group, but comes from outside.

The researcher worked for the former Translation Department at Villa Clara Medical Information Center, from 2005 to 2011. After taking part in the World Congress on Specialized Translation, on December 2008, the researcher learned about how instrumental competence have evolved in recent years, and from that date he began to gather more information and knowledge about this topic.

The Translation Department was his field of participant observation from 2009 to 2011.

The objective of the participant observation was to gather data about:

- The format used for translation.
- Number of computers available for translators.
- Internet connection.
- Kind of resources used for documentation.
- Knowledge and use of ICTs applied to translation.

➢ Survey

The survey is a non-experimental, descriptive research method. Surveys can be useful when a researcher wants to collect data on phenomena that cannot be directly observed. Nerelys de Armas and Alberto Valle (2011) state that as an empirical method, surveys allow obtaining information from large groups and the results are generally quantitatively processed. They allow collecting large amounts of information in a short period of time. These authors classify surveys in: direct or indirect, personal, special and opinion; standardized, non-standardized and mixed. Other authors like Babbie (1973) classify them in cross-sectional and longitudinal surveys.

**Cross-sectional surveys** are used to gather information on a population at a single point in time. An example of a cross sectional survey would be a questionnaire that collects data on how parents feel about Internet filtering, as of March of 1999.

**Longitudinal surveys** gather data over a period of time. The researcher may then analyze changes in the population and attempt to describe and/or explain them.

**Survey Application**

Surveys can be either applied directly to a group or person or indirectly through the mail.

Direct surveys can be applied to students in classrooms, for example. They can also be applied to users of a certain library or institution.

**Electronic surveys**

They are currently widely used via Internet or e-mail, which due to their efficiency and speed the researchers’ work is greatly benefited. Because electronic mail is rapidly becoming such a large part of our communications system, this survey method deserves special attention. The following strengths and weaknesses were taken from the education website Writing@CSU (2012)
Strengths

Cost-savings: It is less expensive to send questionnaires online than to pay for postage or for interviewers.

Ease of Editing/Analysis: It is easier to make changes to questionnaire, and to copy and sort data.

Faster Transmission Time: Questionnaires can be delivered to recipients in seconds, rather than in days as with traditional mail.

Easy Use of Preletters: You may send invitations and receive responses in a very short time and thus receive participation level estimates.

Higher Response Rate: Research shows that response rates on private networks are higher with electronic surveys than with paper surveys or interviews.

More Candid Responses: Research shows that respondents may answer more honestly with electronic surveys than with paper surveys or interviews.

Potentially Quicker Response Time with Wider Magnitude of Coverage: Due to the speed of online networks, participants can answer in minutes or hours, and coverage can be global.

Weaknesses

Sample Demographic Limitations: Population and sample limited to those with access to computer and online network.

Lower Levels of Confidentiality: Due to the open nature of most online networks, it is difficult to guarantee anonymity and confidentiality.

Layout and Presentation issues: Constructing the format of a computer questionnaire can be more difficult the first few times, due to a researcher's lack of experience.

Additional Orientation/Instructions: More instruction and orientation to the computer online systems may be necessary for respondents to complete the questionnaire.
Potential Technical Problems with Hardware and Software: As most of us (perhaps all of us) know all too well, computers have a much greater likelihood of "glitches" than oral or written forms of communication.

Response Rate: Even though research shows that e-mail response rates are higher, Opermann (1995) warns that most of these studies found response rates higher only during the first few days; thereafter, the rates were not significantly higher.

Questionnaire

The questionnaire is the instrument used for information gathering. It can be either applied directly to a group or person or indirectly through the mail.

Questionnaire advantages are:

a) Its cost is relatively low.

b) Allows gathering data from many people in a relatively short period of time.

c) Its quantification is more or less simple.

d) Once tabulated it allows coming to conclusions.

Its disadvantage is that it only gathers opinions; you can not go very deep into some aspects of the research.

Types of Survey Questions

According to the information given in the SuperSurvey website (2007), survey questions vary according to what type of information they are trying to collect from the respondents, and how this information will apply to the goals of the survey. There are two basic types of survey questions: open-ended and closed-ended.

Open-ended

This type of question allows participants to respond in any way they choose. Open-ended questions provide primarily qualitative data, and are frequently used in exploratory research.
Closed-ended

In contrast to open-ended questions, closed-ended questions require participants to choose from a limited number of responses predetermined by the researcher. There are 5 basic types of closed-ended questions: multiple-choice; categorical; likert-scale; numerical; and ordinal. Closed-ended questions provide primarily quantitative data, and are frequently used in confirmatory research.

Our Survey

With the purpose of characterizing IC in Cuban medical translators a cross-sectional survey was developed (Annex 5).

The questionnaire used as instrument for data gathering was created with a combination of close-ended and some open-ended questions. The former kind was predominant. Likert-scale and multiple-choice were the most used kind of close-ended questions, in this order.

The following elements were considered when developing the questionnaire:

- It can be completely answered in no more than 15 minutes.
- The language used is supposed to be familiar to the translators sampled.
- Topics are not mixed. For this purpose topics are placed into 3 "sets" of questions. These are:
  a) General Aspects. These are kind of warm-up questions. Easier questions that ease the respondent into the survey and set the tone and the topic of the survey. They offer valuable information about basic elements related to IC.
  b) Consultation of external resources. These questions have to do with the first element of IC, i.e. use of resources on the part of the translator.
  c) ICTs applied to Translation. These questions had to do with the second element of IC.
- Double-barreled questions are avoided (questions ask only one clear thing).
- A precise introduction with the following details was given:
a) Name of the survey

b) Respondents are informed about the research on instrumental competence (IC) being conducted. The term IC is defined.

c) The aim of the survey which is to characterize IC in Cuban Medical translators is also stated.

d) The researcher guarantees that respondents’ names will not be published in the findings.

e) Respondents are thanked for their participation.

**Pilot Test and Critiquing**

Talab (2008) states that instruments developed by the researcher should always be pilot tested. This means that the survey would be offered to a similar group outside the area of the group to be surveyed or studied. By doing this, ambiguous, duplicate, or unclear questions are determined and eliminated before the final survey is administered. In general, subjects similar to those who will be in the study sample (but not included in the actual sample) may serve as subjects for pilot testing. Results of pilot testing and accompanying comments should be used, if necessary, to revise the instrument before distributing it to the actual sample. Pilot tests are very helpful in determining the clarity, utility, and validity of questions.

Once the questionnaire was developed, it was pilot tested with three translators. They were selected because they met all the inclusion criteria, except for the fact they were not actively working as translators of the National Health System. Two of them were recently retired translators. The other was on leave at that time because she was pregnant.

Critiquing was also used to assess the questionnaire. In this case an expert in the theme revised it and made some valuable recommendations.

Both the opinions of the translators and the expert were considered in the final version of the questionnaire.
Preletters

When the questionnaire was finally developed and corrected, preletters via e-mail (Annex 6) were sent on June, 2012 to the 20 translators who met the inclusion criteria inviting them to take part in the survey. Most of those who responded did it on the same month and expressed their willingness to take part in the survey. Preletters to non-respondents were sent a second time via e-mail asking for their participation. Six of them never responded. Thus, the sample was 14 translators.

On September, 2012, surveys were directly sent through e-mail to each participant and they were received back on the same month.

➢ Triangulation. To obtain the points of contact and the differences among the different methods applied.

According to Hernández (2011), triangulation is an essential procedure whose use requires from the researcher’s skill to make that the contrast among the different perceptions leads to right and valid interpretations. It is a powerful procedure of analyses that offers the researcher different ways to prove through crossed verification the different points of view, methods, spaces and time among others. Particularly, it refers to the application or combination of various methodologies of research in the study of the same phenomenon which could be applied in qualitative, quantitative or mixed research.

In the present research, triangulation was applied to the analysis of documents, participant observation and the survey, which allowed us to get to final conclusions about the theme researched. As no similar research on IC was found, there were no other findings with which to compare ours. For example, the results of PACTE’s research that has been conducted for nearly 10 years (in which IC is included) has not been published yet (it will be soon published in a book). The results of triangulation will be shown in Chapter 3.

Survey units of analysis:

- It must be remembered that the survey was divided according to topics placed into 3 "sets" of questions. They were:

  a) General Aspects.
b) Consultation of external resources.

c) Specific ICTs applied to Translation.

In the first one the units of analysis were:

- Translation format (paper or digital)
- Having a computer at work
- Internet connection

In the second set the units of analysis were:

- Traditional vs. Digital resources
- Impersonal vs. Personal resources.
- Use of general or specialized dictionaries.
- Use of medical databases in Internet
- Use of general ICTs.

In the third set the units of analysis were:

- Knowledge and use of automatic translation (AT).
- CAT tools knowledge and use (translation memories).

The resulting data were classified according to the units of analysis and converted in percentages. These findings were of great help in drawing the final conclusions of the research.

Statistical and/or mathematical methods.

- Percent Analysis was used to quantitatively evaluate results, and to translate them into a qualitative description.

2.5 Summary of the Chapter

In this chapter the methodology used to propose a new model on IC and to characterize this competence among Cuban medical translators was described. For this purpose, the research context and background, population and sample, different research stages: Review of selected research literature, Proposal of a new model on Instrumental
Competence, Data Collection, Data analysis and findings were analyzed and so were the methods used in each of them.
CHAPTER 3. DATA ANALYSIS AND FINDINGS

3.0 Introduction to the chapter

In this chapter, the two main findings of the present research will be described. The first one is the proposal of a new model on Instrumental Competence (IC) and the second is the characterization of this competence among Cuban Medical translators.

In the first part of this chapter, reasons are given for the need of a new model on IC, as well as the theories on which it is based. Then, the model is broken up in its main two elements and sub-elements in order to explain their concepts and functions in the whole. Finally, the contributions of this new model are given.

In the second part of the chapter, the results of the different empirical methods used are given: analysis of documents, participant observation and the survey. Then, triangulation is made to arrive at the final conclusions about the current state of IC in Cuban medical translators, which is the main purpose of this research.

3.1 Need for a new model of IC

In her doctoral dissertation “Competencia Instrumental para la Reproducción textual en lengua extranjera: procesos de consultaléxica en fuentes externas” Inna Kozlova (2005) offers a model of Instrumental Competence and also deals with its development. This is the only model of IC found in the available literature. This author was a member of PACTE group.

Regarding Kozlova’s model of IC we see two main flaws which were introduced in chapter 1 and that will be detailed below.

The first problem in Kozlova’s classification of external sources of information (and in other works on this theme by other authors) which she proposes, is that she does not include people as a kind of resource that translators can use.

The second problem is that as the author explains from the very beginning of her work, her main focus of research is consultation competence or documentary competence and she aims to explain the mechanisms of consultation in external sources of information.
Thus, Kozlova does not explicitly analyze the role of ICTs as part of IC. In other words, ICTs are not included (at least explicitly) in her model of IC.

This model, therefore, does not allow us to fully understand what instrumental competence really comprises, that is both knowledge and use of resources (which we prefer to define as documentary competence) and also ICTs applied to translation (PACTE, 2011) (which we prefer to redefine as knowledge and use of specific ICTs applied to translation).

To sum up, it was not possible to develop a questionnaire based on this model as it does not offer an explicit explanation of either the elements of documentary competence (and does not include key elements that are part of external resources such as people) or of specific ICTs applied to translation.

3.2 Foundations for the new model

Our proposal is based mainly on four elements:

1. PACTE’s concept of Instrumental Competence which comprises the use of sources of documentation and information technologies applied to translation. (PACTE, 2011)
2. The approach and classification of ICTs given by Diéguez and Lazo (2004). They classify them in general and specific ICTs.
3. The model of IC proposed by Kozlova (2005)
4. Kelly’s statement that CAT tools such as Trados should be part of the translator’s instrumental competence. (Kelly, 2005).

3.3 New Model

The model we propose is the following
Fig. 6 New model of instrumental competence
3.3.1 Description of the model

The main two elements of IC are: 1) Documentary competence and 2) knowledge and use of specific ICTs. Both will be analyzed separately.

1) Documentary competence is divided in: a) knowledge of resources and b) command of consultation procedures. This classification is based on Kozlova’s model for IC as a whole. In this new model this classification is only applied to documentary competence.

a) Knowledge of Resources includes a general knowledge of the variety of resources, their possible contents and kinds of access. (Kozlova, 2005)

A contribution of the present research is the proposal the following classification of resources:

1) Impersonal resources
2) Personal resources

Impersonal resources: External resources that are found on certain formats and are an extension of human memory. In this case, the main formats are paper and digital.

Taken into consideration the format, impersonal resources are divided in printed or traditional resources and digitalized resources:

a) Printed or traditional resources.
   - Dictionaries
   - Thesaurus
   - Encyclopedias
   - Manuals
   - Auxiliary texts

These have been used by translators throughout history and have constituted essential tools for them. It was not until the last decades of the XX century that their use began to be substituted by their equals that appeared on a different format: digitalized resources.

b) Digitalized resources (their used is based on general ICTs)
   - Dictionaries
   - Thesaurus
- Encyclopedias
- Manuals
- Auxiliary texts
- Electronic Corpora
- Databases

These modern tools for translators came with the evolution of ICTs and nowadays few translators still hold on to the exclusive use of the printed resources. However, there are three possibilities regarding their use:

- To use only digital resources.
- To use only printed or traditional resources.
- To use both.

Advantages of digitalized resources over traditional ones:

- They allow more than one access form (alphabetic and thematic)
- The consultation procedures are faster which allows comparing several resources almost simultaneously.
- Can be edited by users according to their experience which can facilitate future translation projects.

**Personal Resources:** The human memory was the first storehouse of knowledge; however it turned out to be insufficient for life in society (Kozlova, 2005). Personal resources refer to those resources that are found in human memory of people. We propose to classify these resources according to the way you access to the information people possess. First, you can contact a person directly or you can have access to a person through the tools offered by the general information and communication technologies (ICTs).

When translators have a translation problem, the following people might be of help:

- Specialists on the topic of translation (doctors or health workers in the case of medical translations, lawyers for legal documents, etc.)
- Other translators
- Native speakers (in the case of inverse translation)

There are two forms to access these resources:
1. **Person to Person.**

In this case, the person we think might help us solve the problem is near; therefore the consultation can be done personally. This is the case when medical translators, who work at hospitals, go directly to a doctor to confirm a tentative translation they have made. For example, there are times that we have two or more possible translation for one term in Spanish. As we are not specialists in the matter, we need a professional worker to tell us which is the correct term.

Another case is when translators work at translation departments. The information flow among them should be abundant as they make constant and direct consultations with each other.

Consultation with native speakers in the case of inverse translation is a valuable tool, especially for lexical and grammatical corrections.

2. **People through the general information and communication technologies (ICTs).**

We can access other people (just as explained above) who might have the information we need through:

- Forums in the Internet
- Email
- Chat

These technologies (and some others) allow us to solve translation problems from our seats, with no need to spend time and physical energies going somewhere else. Of course, Internet connection is indispensable for their use.

There are currently many good examples of translation forums in the internet such as Wordreference.com and ProZ.com through which translators can exchange information and introduce new problems that the translator community can help to solve.

**B) Command of Consultation Procedures**

Kozlova (2005) in her work “Competencia Instrumental para la Reproducción textual en lengua extranjera: procesos de consultáléxica en fuentes externas” offers a model for the consultation process which was shown in chapter 1. This process includes the following steps:

1. Identification of the problem on the basis of the task.
2. Formulation of the search criteria (what do I want to find).
3. Formulation of an access key (what do I have).
4. Application of the key to get to the information.
5. Application of the search criteria and identification of candidates.
6. Evaluation of candidates on the basis of the task.

These steps are applicable to any kind of resource and allow the development of more specific professional abilities that consist of the command of consultation procedures in specific resources.

Our proposal here is to divide this category in a) Command of traditional resources and b) Command of general ICTs.

a) **Command of traditional resources**: These can be printed resources or people.

   **Printed Resources**: Translators should know the content of different types of dictionaries and the way to access (alphabetical or thematic access) to the information found in them. The same happens in the case of encyclopedias, manuals, thesaurus, auxiliary texts, etc. The process that is followed in this case is similar to the consultation process model made by Kozlova.

   **People**: Translators should know how to access to the information they think some people might possess. For this purpose, they should find the best way to establish a consultation process similar (but not equal) to the one proposed by Kozlova. There are differences in how to approach and ask a question to a specialist on the theme, to another translator or to a native speaker. It would be interesting to propose a model on the different consultation processes that take place when these people are consulted.

b) **Command of general ICTs**

With the arrival of the information era many things changed. The translation profession has also changed. Now, in order to be a competent translator it is a must to be computer literate and to keep one’s information technologies skills updated. As stated above, digitalized resources have many advantages over traditional resources.

This category has two subdivisions:

a) The competence needed to use electronic dictionaries, thesaurus, encyclopedias, auxiliary texts, corpora, and data bases. Regarding corpora, the translator should be competent in working with certain programs that allow corpus use. For
example, concordance generator programs can find all the times that a certain term appears in a text or in several texts written in electronic format. It can also show a list of the context in which the term appears. Furthermore, the creation of ad hoc or DIY corpus is nowadays a valuable tool for translators.

b) The use of email, chat, forums in internet and other general ICT applications such as search engines, grammar and spell checkers, etc.

Second Element of IC: Knowledge and use of specific ICTs
This is the second element of IC and it has to do with the use of automatic translation and computer assisted translation tools (especially Translation Memories). They are the object of controversy among translators. They have both supporters and opponents. Therefore, in our opinion, we see this topic as a philosophy of translation.

The researcher has attended the last two editions of the Symposium Cuba-Canada on Translation, Interpretation and Terminology held in Havana in 2010 and 2012. At these events, several works have been presented in which this topic is the object of debate. There is a resistance for the use of these specific ICT tools, especially from translators of the “old school”, those that have spent most of their lives working without them. We have seen, however, how some of them have changed their minds after they have taken the time to get to know and work with these new tools. In this VIII Symposium the researcher heard the testimony of an outstanding translator from the “old school” who began to use Translation Memories and publicly admitted that it was worth the effort.

This second element of IC is divided in Automatic Translation or Machine Translation and Computer-assisted translation.

Automatic Translation or Machine translation (MT)
It is our opinion that translators need to know the possibilities and limitations of AT as well as quality of the different AT programs.

Computer-assisted translation
We must explain that Computer-assisted translation is a broad and imprecise term covering a range of tools, from the fairly simple to the complicated. These can include: spell checkers, grammar checkers, terminology managers, full-text search tools, etc. However, in our research the term CAT tools is used to refer mainly to Translation memory tools (TM tools) consisting of a database of text segments in a source language and their translations in one or more target languages. There are programs like
“SDL_Trados_Studio_2009_SP2-8.1.1264” that offer many combined tools: terminology management, alignment of documents, spell checker, etc.

There are professional translators against their use; however there are a growing number of translators that support their use. For example:

Regarding instrumental competence, Kelly states that the command of CAT tools such as Trados, which deals with terminological management and translation memories should be part of the instrumental competence of translators (Kelly 2005, quoted by Carola Franssen 2006: 18)

Translation memories store previously translated source texts and their equivalent target texts in a database and retrieve related segments during the translation of new texts.

Such programs split the source text into manageable units known as "segments". A source-text sentence or sentence-like unit (headings, titles or elements in a list) may be considered a segment, or texts may be segmented into larger units such as paragraphs or small ones, such as clauses. As the translator works through a document, the software displays each source segment in turn and provides a previous translation for re-use, if the program finds a matching source segment in its database. If it does not, the program allows the translator to enter a translation for the new segment. After the translation for a segment is completed, the program stores the new translation and moves onto the next segment (Wikipedia 2012).

Today, many translation agencies do not hire translators who do not have or do not know how to work with a certain TM tool. These agencies work on the bases of saving and exchanging translation memories (TM) among their translators.

According to a 2006 survey undertaken by Imperial College (2006) of 874 translation professionals from 54 countries, primary TM tool usage was reported as follows: Trados (35%), Wordfast (17%), Déjà Vu (16%), SDL Trados 2006 (15%), SDLX (4%), STAR Transit (3%), OmegaT (3%), others (7%).

3.4 Contributions of the new model

- The blending of knowledge of resources and command of consultation procedures in only one category: Documentary competence. This is the first main element of IC.
- A second main element of IC is added: Knowledge and use of specific ICTs.
- Considering people as an external resource of information and therefore a new classification of resources in personal and impersonal.
- A clear description of the role of ICTs (both general and specific) within Instrumental Competence and their relation with resources.
- This model can be applied to all fields of translation, not only medical translation.
- This model can be applied to the pedagogy of translation both for undergraduate or postgraduate translation students, especially to foster or improve IC.

3.5 Results of the empirical methods regarding IC in Cuban medical translators

In this second part of the research the results of the empirical methods that were performed to characterize IC in Cuban medical translators are presented. They are analysis of documents, participant observation, the survey and triangulation.

3.5.1 Analysis of documents. Results

The documents analyzed are those that state the functions of translators as well as the knowledge requirements to work as such. The functions have already been detailed in the previous chapter.

What is more relevant here is that in these documents only three requirements for translators are found.

1. The translator must have a university degree.
2. The translator should have a comprehensive knowledge of the mother tongue and the foreign language(s) with which he/she works
3. The translator should make a correct use of translation techniques.

Taken into consideration PACTE’s model on Translation Competence (2011) which includes 5 sub-competences, it can be seen that in these documents only two of them are required a) bilingual competence and b) knowledge about translation. The other sub-competencies (extra-linguistic, instrumental and strategic) are not mentioned.

3.5.2 Participant observation. Results

Taken into consideration the observation tasks, the following results were obtained:
- Most translations were made on paper format, with a pencil.

- There were two computers for 7 translators, who had to take turns to use it. Only one computer had internet connection that means that translators could only use a computer about twice a week.

- There was limited Internet availability for translators. Between 2005 and 2008 there was full time connection but in 2008 it was reduced to collective and personal quotas. Since then, internet availability was limited.

- Regarding documentation, the most used resources were:

  a) Printed dictionaries (specialized and general, and bilingual dictionaries).

  b) Electronic dictionaries (medical and general, bilingual dictionaries). They were introduced and began to be used in the department in 2009. Since then, they were used more often than printed dictionaries.

  c) Other translators. There was a good exchange of information and ideas among translators.

  d) Doctors or specialists in the theme of the translation.

- Regarding knowledge and use of ICTs applied to translation, there was lack of knowledge about these themes. Even though there was Internet access, it was hardly used for translation purposes.

- 57.14% of translators (4 out of 7) were reluctant to learn about new possibilities for translators (automatic translation, use of documentation resources in Internet, CAT tools, etc.).

3.5.3 Survey results

It is good to remember that the survey was divided into three 3 "sets" of questions. They were:

1) General Aspects.

2) Consultation of external resources and general ICTs.

3) Specific ICTs applied to Translation.
1. General aspects

The indicators or units of analysis were: translation format, having a computer at work and Internet access.

a) Translation format

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Digital only</th>
<th>Paper only</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translation Format</td>
<td>12 (85.71%)</td>
<td>---</td>
<td>2 (14.28%)</td>
</tr>
</tbody>
</table>

b) Having a Computer

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer at work</td>
<td>14 (100%)</td>
<td>---</td>
</tr>
</tbody>
</table>

c) Internet access

<table>
<thead>
<tr>
<th>Indicator</th>
<th>All the time</th>
<th>Limited</th>
<th>No access at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet access</td>
<td>2 (14.28%)</td>
<td>9 (64.28%)</td>
<td>3 (21.42%)</td>
</tr>
</tbody>
</table>

2. Consultation of external resources and general ICTs use.

In the second set of questions the units of analysis or indicators were:

a) Impersonal vs. Personal resources.

b) Traditional vs. Digital resources.

c) Use of general or specialized dictionaries.

d) Use of medical databases in Internet

e) Use of general ICTs (Search engines, corpus ad hoc, concordance generator programs)
a) Impersonal vs. Personal

<table>
<thead>
<tr>
<th>Indicator</th>
<th>% of resources provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impersonal resources use</td>
<td>58.21%</td>
</tr>
<tr>
<td>Personal resources use</td>
<td>42.85%</td>
</tr>
</tbody>
</table>

Translators use more impersonal than personal resources although the difference is not very noticeable.

b) Traditional vs. digital

<table>
<thead>
<tr>
<th>Indicator</th>
<th>% of resources provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital resources use</td>
<td>70.23%</td>
</tr>
<tr>
<td>Traditional resources use</td>
<td>41.07%</td>
</tr>
</tbody>
</table>

Translators use more digital than traditional resources. In this case the difference is more noticeable.

c) General vs. specialized dictionaries

<table>
<thead>
<tr>
<th>Indicator</th>
<th>% of resources provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>General dictionaries</td>
<td>73.21%</td>
</tr>
<tr>
<td>Specialized dictionaries</td>
<td>67.85%</td>
</tr>
</tbody>
</table>

Translators use slightly more general dictionaries than specialized dictionaries.
d) Use of medical databases in Internet

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Almost always</th>
<th>Sometimes</th>
<th>Almost never</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of medical databases</td>
<td>9 translators</td>
<td>3 translators</td>
<td>2 translators</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(64.28%)</td>
<td>(21.42%)</td>
<td>(14.28%)</td>
<td></td>
</tr>
</tbody>
</table>

e) (General ICTs) Use of Search Engines (Google)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Almost always</th>
<th>Sometimes</th>
<th>Almost never</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Search Engines</td>
<td>8 translators</td>
<td>3 translators</td>
<td>3 translators</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(57.14%)</td>
<td>(21.42%)</td>
<td>(21.42%)</td>
<td></td>
</tr>
</tbody>
</table>

Creation of an ad hoc or DIY corpus

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creation of an ad hoc corpus</td>
<td>Yes: 3 translators (21.42%)</td>
<td>No: 11 translators (78.57%)</td>
</tr>
</tbody>
</table>

Use of a concordance generator program

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of concordance generator program</td>
<td></td>
<td>14 translators (100%)</td>
</tr>
</tbody>
</table>

3. Specific ICTs applied to Translation.

In the third set of questions, the units of analysis or indicators were:

- Knowledge and use of AT.
a) Use of automatic translation programs:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Automatic translation</td>
<td>8 translators (57, 14%)</td>
<td>4 translators (28, 57%)</td>
<td>2 translators (14, 28%)</td>
</tr>
</tbody>
</table>

The most used AT programs were: Google translate, Bing, Free online translation, Global link, in this order.

b) Use of a Translation Memory program in the past

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of TM program in the past</td>
<td>2 translators (14, 28%)</td>
<td>12 translators (85,71%)</td>
</tr>
</tbody>
</table>

c) Use of a Translation Memory program at present

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of TM program at present</td>
<td></td>
<td>14 translators (100%)</td>
</tr>
</tbody>
</table>

3.5.4 Triangulation

In the present research, triangulation was applied to the analysis of documents, participant observation and the survey.

Triangulation of these three methods yielded the following findings:

- Translators were not required to keep their instrumental competence updated.
- Most translators had a computer and limited internet access at their workplace.
- Impersonal resources were used more often than personal ones.

- Digitalized resources (which include the use of general ICTs) were used more than traditional ones.

- Extended use of medical databases in Internet such as Pubmed or SCielo.

- Search engines such as Google were widely used to locate information.

- There was a generalized lack of knowledge and use of corpus linguistics and concordance generator programs.

- Little more than half of translators used automatic translation.

- There was a generalized lack of knowledge and use of translation memory programs.
Conclusions

The overall aim of this research was to characterize IC in Cuban Medial translators. In the comprehensive literature review carried out on the theme only one model of IC in the available literature was found and it turned out not appropriate for our purpose. Therefore, a new model was proposed, that is both comprehensive and detailed and in which the two main elements of IC with their sub-elements and the relationships among them are described.

Based on this new model, IC was characterized and from the analysis of the main findings it can be concluded that documentary competence, one of the two main elements of IC, is more developed among Cuban medical translators than the use of specific ICTs applied to translation, the second main element. The final conclusion is that IC as a whole is not developed enough taken into consideration the current trends of translation worldwide, where great emphasis is given to the use of both general and specific ICTs applied to translation.
Recommendations

For the professors in charge of designing the curricula of translation courses:

- The findings and conclusions of this research could be used to modify or improve the current curricula of translation postgraduate courses, such as “Diploma courses”, according to the strengths and weaknesses found. Special attention should be given to the use of both general and specific ICTs applied to translation as many of the current active translators have not receive any training in this sense.

- Since documentary competence (one of the two main elements of Instrumental competence) is so important to translation, Information Literacy courses should be considered as a subject to teach to both undergraduate and postgraduate translation students. Information about the content of such courses could be obtained at the Provincial Information Center of Medical Sciences in Villa Clara. More specifically the work “INFOLITRANS: a model for the development of information competence for translators” by María Pinto and Doras Sales available at http://www.mariapinto.es/e-coms could be used for this purpose.

For the medical translator community:

- To take advantage of the Information Literacy courses taught at the different Information Centers of Medical Sciences throughout the country.
- To consider the advantages of Automatic Translation, especially the use of Google Translate.
- To find information about corpus use and build our own corpus ad hoc, which are simple to build and combined with a concordance generator program can be of great help.
- To strengthened our community in order to exchange experiences, translation problems and also software such as translation memories or other useful tools for our work. This can be accomplished through the existing Health Sciences Translation Website available at: http://www.sld.cu/sitios/traducciones
References:


   https://www.ischool.utexas.edu/~palmquis/courses/survey.html


   http://www.erudit.org/revue/meta/2005/v50/n2/011004ar.html


Annex 1. Directorio de Traductores del sector de la Salud Pública de Cuba

A continuación se muestra la relación de traductores del Sistema Nacional de Salud de Cuba:

**CPICM Pinar del Río**
Lic. Isabel Estrada Mezquía. Idioma Inglés

**CNICM La Habana**
Lic. José Julián Rodríguez Ramos. Idioma inglés
Lic. Iris Gretchen González Nieto. Idioma inglés
Lic. Mayda Jiménez Lafranki. Idioma inglés
Lic. Elsa Zuferri Abello. Idiomas inglés y portugués
Lic. Caridad Juana Karell Marín. Idiomas francés e inglés
Lic. María Cristina Gandón Ruíz. Idioma ruso
Lic. Irma Castillo Pereira. Idioma alemán
Lic. Fara Martha González Fernández. Idioma alemán

**CPICM Mayabeque**
Lic. Lester Hernández García. Idioma inglés

**CPICM Matanzas**
Lic. Joel Juan Vega Díaz. Idioma inglés

**CPICM Villa Clara**
Lic. Nelson Piñero García. Idioma inglés
Lic. Miguel Ángel de Armas Castro. Idioma inglés

**CPICM Sancti Spíritus**
Lic. Gerardo González Valdivia. Idioma inglés

**CPICM Cienfuegos**
Lic. Flavia Lilia Rodríguez Pretel. Idioma inglés

**CPICM Ciego de Ávila**
Lic. Ihaneya Torí Hernández. Idioma inglés
Lic. Gretel de Armas Díaz. Idioma inglés

**CPICM Camagüey**
Lic. Kenia Urra Torres. Idioma inglés

**CPICM Las Tunas**
Lic. Gladys Carmen Quintana Centeno. Idioma inglés
CPICM Holguín
Lic. Denis Coello Velázquez. Idiomas ruso e inglés

CPICM Granma
Lic. Elizabeth Guevara Cabrera. Idioma inglés

CPICM Santiago de Cuba
Lic. Xiomara Cascaret Soto. Idioma inglés
Lic. Bertha Piedra Quintero. Idioma ruso

Guantánamo
Universidad Médica
Lic. Maitée Dorsant Iznaga. Idioma inglés
Lic. Yasenia Laffita Abad. Idioma inglés

CPICM Guantánamo
Ángel Luis Salazar. Idioma inglés

**Lic. Irma Castillo Pereira:** Editora principal, Licenciada en Lengua Alemana/Traductora e Intérprete | Centro Nacional de Información de Ciencias Médicas, Ministerio de Salud Pública | Calle 23. Plaza de la Revolución, Ciudad de La Habana, CP 10 400 Cuba | Teléfs.: (537) 8383893, Horario de atención: lunes a viernes, de 8:30 a 5:00 p.m.

**Políticas del Portal.** Los contenidos que se encuentran en Infomed están dirigidos fundamentalmente a profesionales de la salud. La información que suministramos no debe ser utilizada, bajo ninguna circunstancia, como base para realizar diagnósticos médicos, procedimientos clínicos, quirúrgicos o análisis de laboratorio, ni para la prescripción de tratamientos o medicamentos, sin previa orientación médica.

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Annex 2. Functions of translators at the Medicentro Journal

Centro Provincial de Información de Ciencias Médicas de Villa Clara.

Nominación del Cargo: Traductor “A”

1. Traducir los resúmenes y títulos de la revista Medicentro Electrónica.
2. Revisar la escritura de las referencias bibliográficas y palabras clave de los artículos de la revista Medicentro Electrónica que se encuentran en inglés.
3. Dominio de los nuevos sistemas gestores editoriales, Open Journals System.
4. Traducir todo tipo de texto escrito de una o más lenguas extranjeras a la lengua materna y viceversa.
5. Realización de cotejos, y verificación de la fidelidad e integridad de los originales traducidos.
6. Realización de investigaciones bibliográficas, y explorar las ediciones en lenguas extranjeras y hacer proposiciones fundamentales sobre obras que a su juicio merezcan considerarse para su utilización como referencia del trabajo editorial.
7. Participar activamente en el proceso de edición de la revista Medicentro Electrónica.
8. Trabajar bajo la dirección técnica de redactores-editores de experiencia.
9. Realizar eventualmente interpretación oral en ambas direcciones a los participantes en reuniones, entrevistas, consultas y visitas.
10. Realización de búsquedas de la terminología especializada para glosarios y fondos de datos terminológicos.
11. Colaboración en la preparación de originales con los redactores a solicitud de éstos.
12. Traducción escrita inglés-español y español-inglés.
13. Cumplir con las indicaciones dadas para la seguridad informática.
14. Elaboración y/o participación en proyectos de investigación y colaboración relacionados con el trabajo editorial.
15. Entregar el cumplimiento y afectaciones para el plan de trabajo mensualmente.
16. Asesoría y atención a usuarios.
Annex 3. Functions of translators at the Provincial Information Center

Centro Provincial de Información de Ciencias Médicas. Villa Clara.

NOMINACIÓN DEL CARGO: TRADUCTOR “A”

GRUPO: X

FUNCIONES GENERALES Y ESPECÍFICAS

1. Traduce todo tipo de texto escrito de una o más lenguas extranjeras a la lengua materna y viceversa

2. Realiza eventualmente interpretación oral en ambas direcciones a los participantes en reuniones, negociaciones, entrevistas, consultas y visitas.

3. Realiza la búsqueda de la terminología especializada para glosarios y fondos de datos terminológicos

4. Traduce y transcribe textos grabados.

5. Es responsable directo de los originales que se le confíen, responsabilizándose tanto de los aspectos de contenido científico, político e ideológico como de los de redacción y estilo.

6. Realiza cotejos y verifica la fidelidad e integridad de los originales traducidos.

7. Lleva a cabo, eventualmente investigaciones bibliográficas y explora las ediciones en lenguas extranjeras y hace proposiciones fundamentales sobre obras que a su juicio merezcan considerarse para su utilización.

8. Colabora en la preparación de originales con los redactores a solicitud de estos.

9. Traducción escrita inglés-español y español-inglés

10. Realiza otras funciones de similar naturaleza según se requiera.

11. Imparte cursos de inglés

REQUISITOS DE CONOCIMIENTOS:

Graduado de Nivel Superior. Poseer un profundo dominio de la lengua materna y de la lengua o las lenguas extranjeras que trabaja, así como de las técnicas de traducción.
Annex 4. Translation Department of the National Information Center

Departamento de Traducciones

El Departamento de Traducciones del Centro Nacional de Información de Ciencias Médicas-Infomed se ocupa de la traducción de textos científico-técnicos de los idiomas inglés, portugués, alemán, francés y ruso al idioma español. También realiza traducciones al inglés, francés y portugués de los resúmenes de las Revistas Médicas Cubanas.

La misión del equipo de trabajo es contribuir a la difusión de la información científica especializada en la red de salud de Cuba con el apoyo de técnicas y herramientas de traducción.

Funciones principales del Departamento de Traducciones:

1. Traducir información científico-médica para el Portal de Infomed y espacios afines.
2. Colaborar con el departamento de Cencomed en la realización de eventos de carácter internacional, virtuales y presenciales.
3. Mantener actualizado el Glosario Multilingüe de Términos Médicos de la red Infomed.
4. Contribuir a un mejor uso del idioma español entre los profesionales de la salud.
Annex 5. Survey

Encuesta a traductores cubanos del área de la medicina para caracterizar la competencia instrumental

Estimado traductor:

Estamos desarrollando una investigación sobre el tema de la competencia traductora, específicamente la sub-competencia instrumental, que es la relacionada con el uso de la documentación y las tecnologías de la información y las comunicaciones (TIC) aplicadas a la traducción.

La presente encuesta tiene como objetivo recopilar información de traductores cubanos del área de la medicina que permita caracterizar esta sub-competencia en este grupo de traductores.

Le estamos muy agradecidos por su importante colaboración en esta encuesta y le garantizamos que no publicaremos su nombre como parte del análisis y los resultados de la investigación.


1. Aspectos generales
   a) ¿Hace usted las traducciones en formato digital o en papel?
      ______________________
   b) ¿Dispone usted de una computadora en su centro de trabajo para realizar las traducciones? Marque con una X.
      Sí_______ No______
   c) ¿Tiene acceso a Internet en su centro de trabajo? Marque con una X.
      Sí, todo el tiempo________
      Sí, pero con limitaciones_______
      No tengo acceso ________

2. Recursos de consulta

Al realizar una traducción podemos consultar varios tipos de recursos para completar la información que necesitamos.

Marque con una X la frecuencia con que usted utiliza en la práctica los siguientes recursos:
Diccionarios generales monolingües digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios generales monolingües impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios generales bilingües digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios generales bilingües impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios especializados monolingües digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios especializados monolingües impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios especializados bilingües digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Diccionarios especializados bilingües impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Tesauros digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Tesauros impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Enciclopedias digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Enciclopedias impresas:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Manuales digitales:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Manuales impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Textos auxiliares impresos:
Casi siempre___  algunas veces___ casi nunca____  nunca_______

Textos auxiliares digitalizados:
Casi siempre___  algunas veces___ casi nunca____  nunca_______
-Corpus lingüísticos digitalizados:
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Motores de búsqueda y localización de información en Internet (por ejemplo, Google)
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Textos en bases de datos en Internet (por ejemplo: SCielo, Pubmed, etc.)
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Especialistas (personas) en el tema a traducir (directamente o de manera personal)
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Otros traductores (de manera personal)
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Hablantes nativos de manera personal (en caso de traducción inversa)
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Fóruns en Internet
  Casi siempre___ algunas veces___ casi nunca___ nunca________
- Otras personas (traductores, especialistas en el tema a traducir, hablantes nativos) a través del e-mail.
  Casi siempre___ algunas veces___ casi nunca___ nunca________
Otras personas (traductores, especialistas en la materia, hablantes nativos) a través del Chat
  Casi siempre___ algunas veces___ casi nunca___ nunca________
Otros tipos de recursos:________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
_______________________________________________________________________________________
- ¿Ha creado usted algún corpus lingüístico con fines específicos (corpus ad hoc)?
  Sí_______ No________
- ¿Utiliza usted algún programa generador de concordancia?
  Sí__________ No________
  En caso de ser afirmativa su respuesta, ¿cuál programa utiliza?________________________________________
3. Tecnologías de la información y las comunicaciones (TIC) aplicadas a la traducción.

a) ¿Utiliza usted algún programa de traducción automática? ¿Cuál o cuáles?:______________________________

b) ¿Ha utilizado alguna vez algún programa de traducción asistido por computadora? (Memorias de traducción)
   Sí_____ No_____
   En caso de ser afirmativa su respuesta, ¿con cuál programa ha trabajado?______________________________

c) ¿Utiliza usted en la actualidad algún programa de traducción asistida por computadora? (Memorias de traducción)
   Sí_____ No_____
   En caso de ser afirmativa su respuesta, ¿con cuál programa está trabajando?______________________________
Annex 6. Preletter

Santa Clara, 8 de junio de 2012

Estimado(a) colega,

Mi nombre es Alain Escarrá y soy traductor de una revista médica en Santa Clara, Villa Clara. Actualmente estoy tratando de encaminar mi tesis de maestría y necesito la colaboración de otros traductores. El tema de la tesis es “Competencia Traductora”, y específicamente estoy trabajando el tema de la sub-competencia instrumental, es decir la competencia relacionada con el uso de la documentación y las tecnologías de la información y las comunicaciones aplicadas a la traducción. Como resultado de la tesis quisiera caracterizar esta competencia en los traductores de la medicina en Cuba.

Como usted sabe, en la actualidad no existen muchos traductores, y para poder realizar este trabajo necesito de su colaboración. Esto consistiría en contestar un cuestionario que será lo más sencillo posible y no le llevará mucho tiempo. Le garantizo que en el análisis de los resultados no se mencionarán nombres, ni regiones. Yo se lo enviaría por correo electrónico y usted después de responderlo haría lo mismo.

Muchas gracias por adelantado y quedaré en espera de su respuesta,

Lic. Alain Escarrá