Strategy for Enhancing Skills of English for Forensic Medicine
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ABSTRACT
There are relatively few studies on the language of forensic medicine. This paper intends to fill this gap and to shed light on the relationship between legal medicine and forensic medicine. Furthermore, building on previous research, we use a corpus-based approach to identify and to investigate frequent terms. Thus, we determine the features of the forensic medicine language to build an innovative strategy for teaching and learning English for Forensic Medicine. Our aim is to analyze the interdisciplinary character of this language and to enhance our students’ language skills through a responsive framework that meets their needs. More precisely, we address the process of developing language learners into reflective practitioners in this digital era and how to implement task-based learning in medicolegal communication. The paper concludes that our strategy has a two-fold outcome: to create an engaging environment for our students and to help them grasp concepts which reveal the intersection between sciences and practices within the domain of forensic medicine.

1. Introduction
Nowadays LSP (the field of Languages for Specific Purposes) has a dual character: it has become independent, as a discipline in itself with its own research agenda, methodology, and applications and multi-disciplinary as a catalyst of other related disciplines in discourse and genre analysis, corpus-based research, multi-modal discourse analysis, critical discourse analysis, communication studies, ethnography of communication, socio-cognitive research on teaching and learning of specialised languages, and, at the same time, a number of other academic and professional disciplines that it tends to serve (Bathia et al., 2011: 1).

Depecker (2015:38) makes a distinction between “special” and “specialized”: “special” means that a word or a group of words belongs to a technical or scientific domain while “specialized” means the process of an ordinary word or group of words that makes it become a term. Moreover, he points out that one of the main principles of terminology science is the definition of a “term” - a “term” is a linguistic unit delimited by the concept it conveys, therefore, a term has a linguistic side and a conceptual side, the idea to which the sign refers (ibidem: 37).

Forensic Medicine versus Legal Medicine

Traditional approach to terminological definitions imposes constraints that are not realistic, because linguistic meaning is based on prototypes. Both terms and their definitions belong to language, so that there is no way to escape from the limitations language imposes on definitions (Hacken, 2015: 4). While searching for relevant studies which concern the language of forensic medicine, we noticed that investigations of this language are very few and bilingual dictionaries for this area are almost non-existent. Since most of the studies that we came across...
promoted the terms “legal medicine” and “forensic medicine”, we consider that before delving into the language of legal medicine, it would be helpful to have a general definition of these terms. Generally speaking, consultation of the explanatory dictionary is determined by insufficient knowledge or incognizance of the meaning or meanings of a word. The process of consulting the dictionary is the first stage of lexical learning, a concept that introduces a relative freedom of knowledge: the passive knowledge which consists of understanding (lexicographic definition), the interpretation (concrete and correct labeling of an extra-linguistic reality), and the active knowledge, which is reflected in the proper use of the unit in various linguistic contexts (Ciocăneanu, 2011). After looking up the terms, we noticed that the Medical Dictionary for the Health Professions and Nursing provides an entry only for “forensic medicine” with two brief definitions, which are not sufficient to define the area of study to a wide audience; instead, it specifies that “legal medicine” is synonymous with “forensic medicine”:

-“The relation and application of medical facts to legal matters.”
-“The law in its bearing on the practice of medicine.” Synonym(s): “legal medicine”

Likewise, Merriam Webster dictionary provides only one entry for “forensic medicine” with a definition that specifies the synonymy between “legal medicine” and “forensic medicine”: “a science that deals with the relation and application of medical facts to legal problems - called also “legal medicine”. To a non-specialist, the information provided by the dictionaries may seem confusing. Capper states in a comprehensive study that the consequences of confusion may be catastrophic and it is thus important that we share the same vocabulary. He exemplifies that there is a big difference between a papule and a pustule and confusion of a “cut” with a “laceration” will send the average forensic pathologist into fits of apoplexy. Also, lawyers usually interact with the medical profession and if lawyers understand something different from a word than does a doctor, then the entire object of the exercise is somewhat defeated (Capper, 2001: 256-259).

Various authors provide a list of desirable qualities of specialized discourse, and consider them to be the most significant requirements that special languages should meet: simplicity and clarity; objectivity; abstractness; generalization; density of information; brevity or laconism; emotional neutrality; unambiguousness; impersonality; logical consistency; use of defined technical terms, symbols and figures (Gotti, 2011).

Analyzing these requirements, we have been tempted to address the question: Are “legal” and “forensic” medicine considered to be synonymous? Many authors highlight their synonymy but Roy Beran argues that the two are different components of the application of medical knowledge upon the legal system. He demonstrates that legal medicine has greater relevance to civil and tort laws, impacting upon patient care, whereas forensic medicine relates to criminal law and damage to, or by, patients (Beran, 2010). In line with Beran’s arguments, Cyril Wecht points out that forensic science is a broader term when compared to legal medicine, in other words the forensic science encompasses legal medicine. Hence, he considers legal medicine to be the field of study and accumulation of materials that deals with the application of medical knowledge to the administration of justice (Wecht, 2005: 245-251).

The author conducts his study through the lens of history, pinpointing the fact that medicine and law have been related from the earliest times, since the functions of the physician and the jurist were united in the priest, the intermediary between God and man. There are ancient documents which justify the fact that Ecclesiastical courts and canon law were concerned with issues not only related to religious matters but also to medicine (e.g. impotence, divorce, sterility, pregnancy, abortion, period of gestation, and sexual deviations).
Wecht discusses the oldest written records starting with the Code of Hammurabi (which dates back to the year 2200 B.C., includes legislation pertaining to the practice of medicine, describes thoroughly the topic of medical malpractice and mentions for the first time the concept of civil and criminal liability for improper and negligent medical care), and continues his comprehensive study with the presentation of evidence that priests in Egypt made determinations regarding the cause of death and whether it was natural or not, while in ancient Greece, although there was a knowledge of poisons and laws against abortions, autopsies were not performed, since a dead body was regarded as sacred. Later on, the great advances in medicine determined the drafting of more elaborate legal codes. The author outlines the fact that there is no clear evidence that medical knowledge was officially used to establish proof in courts of law, but it is known that Hippocrates and others tackled many medico-legal issues (Wecht, 2005: 245-251).

Since the word “forensic” derives from the Latin “forensis” which means “forum” – the meeting place where civic and legal matters were discussed by people with public responsibility, we agree with Rajesh Bardale’s view that forensic medicine deals with the application of medical knowledge in the administration of law and justice (Bardale, 2011).

**Development of the Forensic Medicine Language**

Undoubtedly the language of forensic medicine is a product of the magnificent history of medicine and its application in the administration of law. Nowadays, the forensic medicine area has been evolving in accordance with recent scientific developments and advancement of technological equipment. Around the world, from a chronological point of view, there are three historical stages which impacted the language of forensic medicine. Additionally, we include the fourth stage which determined the appearance of new concepts that reflect the effect of technology upon the language of forensic medicine:

- The first stage which lasted several thousands of years until the 16th century; during this period, legal medicine was not separate from pathological anatomy and surgery, with no specialized treatments or experts.

- The second stage began in the 17th century and was driven by systematic studies, scientific developments, appearance of experts and legislators; this stage was initiated in Italy and had further European proliferation.

- The third stage or the modern period began in the 20th century with the discovery of the blood groups in 1901 and the DNA profile (genetic fingerprint) in 1985.

- The fourth stage which we call the high-technology stage due to the use of ultraviolet and infrared light, electron microscopes, lasers, advanced analytical chemical techniques, and computerized databanks as common practice nowadays to analyze and research evidence. Therefore, a wide range of relevant terms make key concepts within forensic science although they originate from various areas such as law, chemistry, biology, anthropology, forensic computing, etc.

**Corpus Building and Investigation Methods**

Lexical approaches to English for science and technology are largely related to language teaching and learning. Computational research of the linguistic corpus offers the opportunity to investigate the “technical” vocabulary.
beyond the idea of singular word-term in any field of science. Making an inventory of terms for the language of legal medicine is the most important aspect of our analysis in the sense that it is based on quantitatively and qualitatively representative texts that are part of a corpus which encompasses two books, articles that deal with forensic science issues and job descriptions within this domain. The key to using corpus data is to find the balance between the use of corpus data and the use of one’s intuition (McEnery et al., 2006: 7). Researchers appraise corpus linguistics as a whole system of methods and principles of how to apply corpora in language studies and teaching/learning (ibidem), while a specialist corpus is considered “an approach or a methodology for studying language use.” (Bowker & Pearson, 2002). The applications of corpus technologies to LSP range from the identification of high frequency lexis in a specific domain, collocation, colligation and semantic prosody, grammar and discourse, to the contrastive analysis of lexical items in different domains or the contrastive analysis of genres (text-types) in different sublanguages (Albi et al., 2014).

We also used the Simple Concordance Program (SPC) developed by Alan Reed to analyze the texts and the information retrieved from the textual corpus. The basic activity was to extract the terms from the corpus and display them in context, as well as to provide a reference of the place where a certain term appears in text. Terms designate concepts which constitute a system or a conceptual network which makes up part of the knowledge that an individual must master to understand and produce specialized texts within a specific knowledge field (Santos & Costa, 2015:158). Therefore, in the next section we analyze the terms (units of significance) to see to what extent the meaning of forensic medicine is present/absent, whether it is a single specialized meaning of forensic medicine or it is obtained by adding new semantic units that allow the definition of an already existing meaning of medicine or law. Moreover, we analyzed the terminological syntagms and assessed to what extent they meet the linguistic criteria for the formation and the functioning of complex lexical units as they appear in the literature. The data revealed that the specialized lexicon could be more accurately defined as a set of linguistic prefabrications or “multi-lexical units /collocations with a value of formula” (Mudraya, 2006). Thus, the technical vocabulary of forensic medicine includes collocations and words specific to one or more related domains (anatomy, law, biology), with a high frequency of use, specific meaning and specific patterns of co-occurrence.

Results

Features of the forensic medicine language

The interdisciplinarity of a specialist language is known as the presence of a specialized term in a minimum or in more than two domains (Bidu-Vrânceanu, 2007). Other authors consider interdisciplinarity as a result of the migration of scientific terms from one domain to another, a migration determined by the current state of research, which is characterized by a pronounced interdomain mobility and a collaboration of specialists from different branches of science (Toma, 2006). The interdisciplinarity of the language of forensic medicine is based on certain situations at the ontological level, when the specialists from different fields study the same reality, the same referent, each from the perspective of their own discipline and the methods specific to that discipline. The language of forensic medicine reveals several interesting aspects related to the interdisciplinary relations with other specialized languages, as well as the dynamics and diversity of these relations, because it applies the principles and methodology of medical sciences in the legal field, thus revealing its accentuated interdisciplinary character, which is situated at the border between biological sciences and social-juridical sciences. After analyzing the corpus, we have found both through inventory and descriptive descriptions of the terms from our inventory that the terms of forensic medicine are either common with the medicine science, the social-juridical sciences or with the common language, and the dimension of forensic medicine is added by a unification of objects and concepts.
from the respective areas, leading to a rethinking of the concept or object, in accordance with the principles and rules of the forensic science. Sometimes the difference between the definition of terms used in forensic medicine and the definition of the same terms employed in other areas lies in the end use of the results. For example, Smith & Bluth give a relevant example: in clinical toxicology, the end user is a physician who is using the results to treat and care for a patient, whereas in forensic toxicology, the end user can be a physician, or a nonmedical professional such as a lawyer, a human resources employee, or probation officer who is using the results to determine a cause of death, employment eligibility, or compliance with terms of parole (Smith & Bluth, 2016: 753-759).

From a logical-semantic point of view, the medicolegal denomination acts as an informative unit, and the conceptual units are largely updated by syntagms based on legal terms and on the basis of anatomical terms of Greek-Latin origin which are key terms in all types of composition such as: head injuries, scalp injuries, injury to skull, injury to meninges, injury to brain, injury to spine and spinal cord, injury to chest, injury to abdomen, firearm injuries, injuries caused by rifled firearms, explosion and blast bomb injuries, mechanical injury, abrasion, contusion, lacerated wounds, incised wound, chop wound, stab wounds, fractures, brain death, death certificate, apparent death, modes of death, manner of death, sudden death, postmortem lividity, decomposition, skeletonization, mummification, autopsy, autopsy examination, laboratory investigation, fetal autopsy, exhumation, postmortem artefacts, DNA profiling, DNA evidence, forensic osteology (skull, mandible, femur, tibia, fibula, humerus, radius, ulna, sternum, scapula, clavicle, hipbone, sacrum), etc.

Also, the name and descriptions of professions that we identified in the corpus reflect both the interdisciplinarity of forensic medicine and the impact of technology on the creation of new professions that require digital and interdisciplinary competencies: Coroner, Forensic Crime Scene Officer, Forensic Lab Technician, Forensic Scientist, Forensic Latent Print Analyst, Autopsy Technician, Forensic Analyst, Crime Scene Technician, Forensic Identification Specialist, Forensic Chemist, Forensic Evidence Specialist, Forensic DNA Analyst, Forensic Autopsy Technician, Forensic Anthropologist, Forensic Logistics Specialist, Laboratory Technician, Coroner Investigator Trainee, Administrative Laboratory Assistant, Medical Death Investigator, Chemist, Supervising Criminalist, Forensic Screens Technologist, Digital Forensics Technician, Medicolegal Death Investigator, Microbiologist, Deputy Coroner, Forensics Analyst, Court Clinician, Senior Forensic Investigative Analyst, Technical Investigator, Fire and Evidence Technician, Latent Fingerprint Examiner, Forensic Extraction Technologist, Laboratory Technician Food Microbiology, Food Chemistry Laboratory Technician, Supervising Forensic Investigator, Evidence Technician, Electronic Forensic Analyst, Medical Technologist, Forensic Unit Supervisor, Bio Security Research Scientist, Mass Spectrometry Technologist, Applications Chemist, Specimen Accessioner, Computer Forensic Scientist, Forensic Microscopist, Forensic Investigator, Lab Supervisor, Lead Forensic and Compliance Specialist, Forensic Firearm Examiner, Forensic Biologist, Forensic Pathologist.

**Strategy for teaching and learning English for Forensic Medicine**

The Languages for Specific Purposes (LSP)/English for Specific Purposes (ESP) refer to the specialized discourse and their study includes aspects of communication in fields such as science, medicine, law, environment, etc. The approach is speech-oriented, having as a determining factor the degree of specialization of the text, the relation between the participants in the act of communication, the degree of expertise of the participants, and the aims pursued.

Nowadays, medicolegal experts have entered the era of medical English, in other words they have chosen a single language for international communication. The same phenomenon occurred in the medicine field since medical
terms derived from classical Greek or Latin roots are often, partly or wholly, composed of words borrowed from ordinary English (Wulff, 2004). The terminology of forensic science is the standardized means of communication within the medicolegal field. The importance of fluency in this terminology which applies to many professionals (e.g. doctors, microbiologists, chemists, lawyers, etc.) cannot be overstated.

Students will have to cope with three different communicative situations in their future professions: a) expert addressing other specialists, debating issues within his area of expertise, with a frequent use of specialized terminology whose meaning is taken for granted; b) experts addressing non-specialists, mainly for educational purposes, in order to explain notions regarding their discipline. Whenever specialized vocabulary occurs for the first time, its meaning is illustrated; this is the typical case of academic textbooks and instruction manuals; c) expert addressing the general public, aiming at providing technical information to a wider audience through everyday language, exemplifying specialized concepts through examples taken from the layman’s everyday experience (Gotti, 2011). Language learning tasks, then, may be directed towards addressing the ‘everyday culture’ of non-professional medical discourse versus the ‘professional culture’ of peer directed medical discourse (Lu & Corbett, 2012: 55). According to Van Den Branden (2006: 6-9) “classroom tasks should facilitate meaningful interaction and offer the learner ample opportunity to process meaningful input and produce meaningful output in order to reach relevant and obtainable goals. In other words, tasks invite the learner to act primarily as a language user, and not as a language learner.”

Individual motivation and social motivation are today the decisive factor in succeeding to learn a foreign language; the methods employed by the instructor in his or her class or the methods used by students individually at home have their origins in the components of motivation. Therefore, when teaching and learning English for Forensic Medicine we consider the following methods based on the interdisciplinarity of forensic medicine language:

- Help students analyze words by dividing them into component parts. The teacher explains to them that some terms of forensic science come from medicine science and are constructed of small pieces that make each word unique, with one major difference: the pieces can be mingled and used in lots of combinations to make other words as well. The best route is to present the elements of terms highlighting their roots, suffixes and prefixes like in the following examples:

  **EPIGASTRIC** = prefix EPI (above) + root GASTR (stomach) + suffix IC (pertaining to)

  **INQUEST** = IN (in) + QUEST (to seek) = is a legal inquiry or investigation to ascertain the circumstances and cause of death.

  Compound suffixes are formed by a combination of basic term components as exemplified by (Willis, 2008: 18): the root *tom* (to cut) combined with the simple suffix -y (a process of) forms the compound suffix -tomy (incision); the compound suffix -ectomy (excision or removal) is formed by a combination of the prefix *ec-* (out) with the root *tom* (to cut) and the simple suffix -y (a process of).

- Bring materials and movies that relate the medical terms to the structure and function of the body. The use of movies in teaching (e.g. the American movie “Bullitt” starring Steve McQueen) has proved to be a great resource in motivating students to become involved in communication scenarios. Our major focus has been to explain terms in the medicolegal context and how to assess the medical causes of death, especially because medicolegal terms explained in their proper context will be easier to remember.
-Instruct students to become aware of spelling and pronunciation problems as some medical terms are pronounced alike but are spelled differently, which accounts for their different meaning. For example, “ilium” and “ileum” have identical pronunciation, but the first term, “ilium”, means a part of the hip bone, whereas “ileum” is a part of the small intestine (Chabner, 2014).

-To be pedagogically prepared, teachers need to acquire skills and experience in the types of technologies most likely to be found or that create learning opportunities that suit a particular type of activity from the area of forensic medicine (Howell, 2012). Language education is permanently reinvented by the multitude of digital resources. The description of language, particularly spoken language, has been enriched by the availability of collections of searchable, digitised texts: most pedagogical dictionaries and grammar books now make a virtue of being corpus-based, and many are available online, accessible by both computer and mobile phone (Lu & Corbett, 2012: 55).

-Acting as proactive instructors, we have always encouraged students to embrace mobile learning after testing the free apps for Forensic Medicine from Google Store. Mobile learning has become popular and many researchers explained how mobile learning could support various kinds of learning. Among them, we mention Pereira and Rodrigues who presented the “evolution of the learning models” where mobile learning is considered the most recent model, because it reduces the limitations of the previous models (Pereira & Rodrigues, 2013). Another significant researcher is Siemens whose theory of “connectivism” is described as “including technology and connection making as learning activities begins to move learning theories into a digital age.” (Siemens, 2005). Embracing this theory of connectivism we highly recommend the use of the Forensic Medicine: Medico App 1 apk. This app (see Fig.1) is listed in the Education category of play store and has been developed by http://medicoapps.org. Forensic Medicine: Medico Apps can be downloaded and installed on Android devices supporting 10 api and above.

We have demonstrated its efficacy as it has improved students’ specialist vocabulary through customization of learning, and provision of discipline-specific materials and tasks. In a recent study, Morandi asserts that smartphones positively influence the process of German language learning, based on a survey which reveals that a large number of participants (89.29 %) believe that mobile phones (smartphones) were effective to a great extent in the development of their German language skills, while out of 28 participants of this study, 3 (10.71%) think that smartphones were effective to some extent (Morandi, 2017: 268).

Conclusions
The interdisciplinarity of the forensic medicine language is characterized by semantic identity and equivalence between the uses of a term in different terminologies. We noticed that there is a conceptual or referential content...
motivation that ensures the conceptual transfer. Teachers need to recognize that English language teaching is inherently value-laden and to add another thick layer to the object of their critical reflection – technology (Chapelle, 2003: 8-9). The principles underpinning the teaching and learning strategy in the achievement of the proposed objectives for the acquisition and enhancement of English for Forensic Medicine are the following:

- Methodological design of the lessons according to the specific needs of the students;
- Choosing key themes from forensic science and using technology – movies, mobile apps to stimulate and engage students in role-play activities which are meticulously prepared and tailored for the medicolegal work;
- Careful selection of specialized texts as a support for the development of the vocabulary in the field of forensic medicine and revealing the specific of the oral and written communication style that characterize this area;
- Monitoring and explaining grammar aspects whenever necessary for the use of fluent speech and correct writing and understanding;
- Developing the spirit of rationality and creativity, critical and decision-making through active, interacting and situational debates, conversations and activities that require the intense activation of functional interactions between thinking and language to continuously strengthen the structures and functionality of the language of forensic medicine;
- Assignment of individual work tasks that require higher cognitive processes as intelligence, memory, logic, to establish self-learning strategies;
- Simulating linguistic behavior in situations similar to real ones (conversations with a coroner, inquiries on a given theme, debates, etc.);

References


