

CLIL: TEACHING CARDIOVASCULAR ENGLISH TO MEDICAL STUDENTS

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Abstract

Nowadays, higher education institutions pursue the aim of teaching their students foreign languages. This is due to the fact that both professional knowledge and experience are currently gained within the framework of such processes as internationalization, globalization and digitalization. International languages, including English, can help specialists to build relationships with their foreign colleagues, exchange ideas and cooperate successfully. Consequently, for students to acquire both professional and linguistic competencies, new methods and techniques need to be provided at classes. One of such methods is CLIL, or Content and Language Integrated Learning. This approach implies the use of a foreign language for teaching and learning of a non-linguistic subject. CLIL includes content, cognitive, communicative and cultural components and encompasses didactic, linguistic and psychological principles. With medicine being one of the most fast-developing fields of knowledge, medical terminology is also subjected to quick changes such as emergence of new notions and lexical units. There are several ways of developing medical terminology, among which are morphological, syntactic and semantic ways as well as linguistic borrowing from other languages. In this article the focus is on the semantic way which implies metaphoric and metonymic transfer. Metaphors and metonymies have been chosen since medical terms often imply similarity or contiguity with real objects or processes. Thus, the purpose of this paper is to provide a classroom task corresponding to CLIL methodology within the framework of teaching cardiovascular terms built on metaphoric and metonymic transfer.

Keywords: CLIL, medical terminology, metaphor, metonymy, language, communication

1 INTRODUCTION

The XXI century requires an educated person to possess both hard and soft skills. The latter represent abilities of a human being to communicate and work well with other people. Taking into account the fact that the modern world is a system consisting of interdependent economies, cultures and populations, it is difficult to imagine professional communication without cross-cultural interactions. Especially, when it comes to medicine, which is one of the most rapidly growing fields of knowledge. The constant emergence of new branches of clinical medicine and new diseases and a more thorough research of old ones are the factors which demand that medical specialists all over the world exchange ideas and experience and work together on inventing new devices, technologies and methods of treatment. Consequently, for this cooperation to be successful, higher education needs some changes as well.

To adapt to a changing environment, educators keep developing new and effective methods of teaching students of higher educational institutions. One of the latest innovations is Content and Language Integrated Learning (CLIL). CLIL is an approach which helps comprehend the contents of a non-linguistic discipline by means of a foreign language. Thus, classes based on CLIL methodology are to provide special knowledge with the help of a foreign language.

The core components of CLIL, or the 4Cs as Coyle names them, are content, communication, cognition and

culture (Coyle, 2008, pp. 97-111). The glossary developed by Cambridge Assessment English introduces definitions of each component:

- Content is defined as “the subject-specific content or curricular subjects taught through the target language”;
- Communication means that “learners are encouraged to produce subject-specific language orally as well as in writing, and to participate in meaningful interaction”;
- Cognition refers to “cognitive processes or thinking skills such as remembering, understanding and applying, analysing, evaluating and creative thinking”;
- Culture is the final component of the 4Cs and it is sometimes taught “as part of the subject of citizenship” (Cambridge Assessment English, 2019).

Medical terminology is always undergoing structural changes, thus making particular methods of term-formation either productive or non-productive. According to S.V. Grinev-Grinevich, there are currently four methods of term-formation: semantic, morphological, syntactic, morphological-syntactic (Grinev-Grinevich, 2008). Along with these methods, the scientist mentions linguistic borrowings, which help enlarge the already available terminology system.

The current article focuses on the semantic method of term-formation, namely metaphors and metonymies. In this method, a common word gets transformed into a term through acquiring a new meaning or new shades of meaning. Metaphor is defined as “an expression, often found in literature, that describes a person or object by referring to something that is considered to have similar characteristics to that person or object”, whereas metonymy is defined as “the act of referring to something using a word that describes one of its qualities or features” (Cambridge Dictionary). Thus, metaphor is based on similarity between two things and metonymy is based on contiguity between two objects. Both metaphor and metonymy reveal cognitive algorithm of term-formation and represent mental structures provoked by the human ability to see similarities and connections between things. For this reason, it might facilitate the process of understanding and memorizing terms which are formed with the help of these two types of the semantic method.

The objective of the present study is to provide a classroom task which is based on CLIL methodology and which aims at teaching medical students cardiovascular terms built on metaphoric and metonymic transfer. Cardiovascular terminology is chosen due to lack of scientific research relevant to this topic.

2 METHODOLOGY

The following methods are applied in the current article:

- 1) Scientific literature analysis, which is used to define such notions as CLIL, metaphor, metonymy;
- 2) Modelling, which is used to develop a CLIL classroom task.

As for the second point, it should be noted that a task is described as “an activity where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome” (Willis, 1996, p. 36). The structural framework of the task-based CLIL includes such stages as a pre-task (introduction to topic and task), a task cycle (task, planning, report), language focus (analysis and practice), all of which encourage learners to use all their language resources. A detailed framework can be described as follows:

1) Pre-task:

- Students are given the topic and instructions,
- The teacher and students discuss the topic,
- Students are divided into pairs or groups,
- Each group works out a plan and prepares the necessary materials;

2) Task:

- Students deal with the task, while the teacher monitors and assists,
- Students work on the task using a target foreign language;

3) Planning:

- Students think of the way which can help them present their output (presentation/ audio/ video, etc.),

- Students prepare their oral or written reports;
- 4) Report:
- Students introduce their results in the target language,
 - Students may use the language of explaining, classifying, comparing and contrasting as well as make predictions, express consequences, evaluate points of view, describe a process,
 - The teacher gives their feedback;
- 5) Language focus:
- The teacher points out relevant parts from the report and focuses on useful language;
 - The teacher selects language areas to practise,
 - Students get involved in activities to practise the use of the language areas analysed earlier (Cinganotto, Benedetti and Guida, 2019).

3 RESULTS

To develop a CLIL task, it is necessary to analyse scientific literature and define the main notions.

3.1 Literature Review

3.1.1 Metaphor and Metonymy in Medical Terminology

Currently, there is a large number of scientific research works dedicated to the question of metaphoric and metonymic processes in terminologies (Lysanets, 2015; Khakieva, Zekieva and Abdulkhadzhieva, 2019; Smirnova, 2011; Brdar and Brdar-Szabo, 2020). According to George Lakoff and Mark Johnson, who we know as pioneers of cognitive linguistics, metaphors as well as metonymies structure our language and frame our thoughts, attitudes and actions (Lakoff and Johnson, 1980, p.39). Both can be used as part of medical terminology where they can be more or less conventionalized. Moreover, terms formed with the help of metaphoric and metonymic transfer can simplify communication between health practitioners and patients, thus fulfilling metacommunicative function (Brdar and Brdar-Szabo, 2020, p. 308). Also, medical terms based on metaphors and metonymies can be used euphemistically and provide for less stressful and dry communication (Brdar and Brdar-Szabo, 2020, p. 308).

Apart from similarities, there are also differences between metaphors and metonymies. As mentioned earlier, metaphor is based on similarity, whereas metonymy is based on contiguity or association. They can also have different functions: according to Lakoff and Johnson, metaphor is “principally a way of conceiving of one thing in terms of another, and its primary function is understanding”, while metonymy “has primarily a referential function, that is, it allows us to use one entity to stand for another” (Lakoff and Johnson, 1980. p. 36).

As for types of metaphors prevailing in medical terminology, E.V. Smirnova identifies the following categories:

- 1) Colloquial metaphors, which involve comparison with household things and human environment:
 - Room and parts of the room,
 - Household objects,
 - clothes and parts of clothes;
- 2) Conceptual metaphors, which represent ideas existing in the human mind:
 - Construction,
 - War,
 - Sounds,
 - Mechanism,
 - Technology;
- 3) Geographical type of metaphors, which are based on similarity with a terrestrial landscape:

- Landscape,
- Stretch of water;
- 4) Biomorphic metaphors, which have similarities with wildlife;
- 5) Metaphors-somatisms, which are based on similarity with human states or body parts:
 - Human condition,
 - Body parts;
- 6) geomorphic metaphors, which are based on comparison with the shape of an object or a letter:
 - Objects of the external world,
 - Letter of the alphabet (Smirnova, 2011).

As for types of metonymic transfer in medical terminology, Yu.V.Lysanets identifies 13 categories:

- 1) The process – the subject,
- 2) The subject – the process,
- 3) The process – the result of the process,
- 4) The process – the surgery,
- 5) The process – the quantitative indicator,
- 6) The material – the subject,
- 7) The organ – the part of the organ,
- 8) The method – the means,
- 9) The means – the sign of disease,
- 10) The property – the quantitative indicator,
- 11) The quantitative indicator – the disease,
- 12) The condition – the quantitative indicator,
- 13) The disease – the consequence of the disease (Lysanets, 2015, pp. 19-221).

3.1.2 The Notion of CLIL

Among modern teaching methods CLIL is regarded as one of the most popular and effective approaches. The acronym which stands for Content and Language Integrated Learning was introduced by an expert on education David Marsh. He defines CLIL as “any dual-focused educational context in which an additional language, thus not usually the first language of the learners involved, is used as a medium in the teaching and learning of non-language content” (Marsh, 2002). Consequently, there are two main aspects that frame CLIL: the academic subject and the language. At the same time, it should be mentioned that CLIL does not represent a language class: it is a subject class where the subject is taught by means of a foreign language for students to acquire both special and linguistic knowledge.

Another pioneer of the CLIL approach is Do Coyle, who in 1999 developed the 4Cs Framework. As mentioned earlier, the 4Cs stand for four interconnected elements which are content, communication, cognition and culture. Content implies subject matter, topics, project works, cross-curricular approaches; communication is a target language; cognition includes thinking skills and mental processes; culture refers to citizenship and awareness of self and “otherness” (Marsh, Coyle and Hood, 2010). The interrelation of the 4 elements may be provided with the examples below:

- 1) Subject matter aims at students being able to construct their own knowledge and develop specific skills;
- 2) Understanding of the subject matter is only possible when cognitive processes are active and the language is clear;
- 3) Language must be learnt within context;
- 4) The learning context must be based on interaction;

5) Language learning process must involve intercultural understanding.

3.2 CLIL Tasks: Teaching Cardiovascular Metaphors and Metonymies

Task force: the group consists of 23-25-year-old clinical residents of Cardiology Department. The level of language proficiency in English is B1, which means the students are able to comprehend the main points of clear texts on familiar matters, produce simple and coherent texts on familiar topics, describe experiences and events, express hopes and ambitions, justify opinions and explain plans.

Topic: cardiovascular system.

Aims:

- To learn the notions of metaphor and metonymy, understand the differences between the two linguistic phenomena, see the types of metaphors and metonymies in cardiovascular terminology,
- To learn the new professional vocabulary in English,
- To learn to cooperate and work on the same task in teams,
- To learn to produce a visual result,
- To learn to present and describe the achieved results.

Time required: pre-task activities and the task: 2 academic hours (90 minutes); planning and preparation: 1 week; report and language focus: 2 academic hours (90 minutes).

Preparation (teacher):

- To prepare pre-task activities to teach students new linguistic phenomena (metaphors and metonymies) and the new vocabulary,
- To help students understand the objectives and importance of the CLIL task,
- To provide students with useful sources of information,
- To divide students into groups and choose roles within these groups,
- To inform on deadlines and rules,
- To assist groups when it is necessary,
- To evaluate the results.

Materials:

- Worksheets for pre-task activities,
- Dictionaries/ books for learning information and seeing the examples,
- Blackboard, computer and projector for presenting the results.

Desired result: a visual output accompanied by a description in English which includes terms built on metaphors and metonymies.

Presentation of the result: a drawing/ a presentation/ a video.

Assessment of the result: opinion exchange, feedback given by the teacher, extra activity for fixing knowledge.

Procedure:

1) Pre-task activities:

a) The teacher explains the notions of metaphor and metonymy, gives types of each linguistic phenomenon and provides examples. Then students are given a list of cardiovascular terms, from which they are supposed to choose words and expressions formed with the help of metaphors and metonymies. While working on the activity, they can use dictionaries to check the meanings of the given vocabulary.

Suggested Vocabulary: maze, ablation, aneurysm, heart attack, aorta, pericardial murmur, mechanical activity, arrhythmia, stent, motor function, arch on the aorta, dilation, graft, cardioversion, vascular wall, cerebral embolism, lipid, balloon catheter, heart failure, heart hurry, pericarditis, waist of the heart, branchiocerebral trunk, shunted swimming pool.

b) Students work in pairs; they divide the selected vocabulary into metaphors and metonymies and define their types.

The keys: A) Metaphors: heart attack (conceptual: war), pericardial murmur (conceptual: sounds), mechanical activity (conceptual: technology), motor function (conceptual: technology), arch of the aorta (colloquial: parts of the room), vascular wall (colloquial: parts of the room), balloon catheter (colloquial: household objects), heart failure (metaphors-somatisms: human condition), heart hurry (metaphors-somatisms: human condition), waist of the heart (metaphors-somatisms: body parts), branchiocerebral trunk (metaphors-somatisms: body parts), shunted swimming pool (geographical: stretch of water); B) Metonymies: maze (the method – the means), dilation (the process – the surgery), graft (the subject – the process).

c) Students work in the same pairs; they are given texts on the relevant topics. The task is to fill in the gaps with the suggested cardiovascular terms formed with the help of metaphors and metonymies. The words and expressions might need the change of their form.

Example 1:

muscle tissue heart attack (x4) blockage (x2) heart failure build-ups

“A 1) _____, also known as a myocardial infarction, occurs when a 2) _____ stops blood oxygenating the heart muscle. If this is not corrected quickly, the 3) _____ that is lacking oxygen can become damaged, or indeed die. The scale of impact on the individual’s health after the attack is dependant on how long the 4) _____ occurs for, what artery it affected and what treatment was received. Following the initial attack, it is actually possible that 5) _____ or arrhythmias can occur, both of which may prove fatal to the victim. However, given the right treatment many sufferers go on to make good recoveries and can eventually return to their normal activities. The most common reason for 6) _____ worldwide in humans is the generation of coronary artery disease (CAD). This is where arteries are constricted due to plaque 7) _____ and this layer then ruptures. Blood platelets make their way to the site of rupture and start to form blood clots. If these clots are left to become too large, the narrowed artery will block and a 8) _____ inevitably occurs. Heart attacks can also be caused by coronary artery spasms, but these are rare. Although some people will be genetically predisposed to 9) _____, individuals can reduce risk by keeping their weight down, watching what they eat, not smoking and exercising on a regular basis” (Jones, 2016, p. 46).

The keys: 1) heart attack, 2) blockage, 3) muscle tissue, 4) blockage, 5) heart failure, 6) heart attacks, 7) build-ups, 8) heart attack, 9) heart attacks.

Example 2:

**vessel (x4) tissues pump blood flow blockage (x2) heart attack balloon muscular walls
plaque**

“Although the heart 1) _____ oxygenated blood around the body, the heart’s 2) _____ need their own blood supply. Oxygen-rich blood is delivered to these 3) _____ via small vessels on its surface – the coronary arteries. These arteries can get narrowed or blocked up with cholesterol causing fatty 4) _____ which slow 5) _____. At times of exercise, not enough blood gets to the heart muscles, leading to pain due to lack of oxygen – angina. If a 6) _____ becomes completely blocked, no blood is able to make it through, causing a 7) _____ where the heart muscle dies. The first way to treat this type of coronary artery disease is with medicines. Secondly, angioplasty can be used, where narrowings in the arteries are stretched using a 8) _____, placing a stent to keep the 9) _____ open. Finally, a heart bypass operation is an option for some patients. The surgeon uses healthy 10) _____ from other parts of the patient’s body to bypass the 11) _____, allowing a new route for blood to flow. This delivers higher volumes of the oxygen-rich blood to the heart muscles beyond the 12) _____, preventing the pain. Most bypasses are performed by stopping the heart and using a heart-lung bypass machine to deliver oxygenated blood to the body. The new 13) _____ are then sewn into place” (Jones, 2016, p.47).

The keys: 1) pumps, 2) muscular walls, 3) tissues, 4) plaques, 5) blood flow, 6) vessel, 7) heart attack, 8) balloon, 9) vessel, 10) vessels, 11) blockage, 12) blockage, 13) vessels.

Example 3:

chambers scar tissue maze (x2)

“1) _____ is a surgical procedure used to treat an irregular heart rhythm (atrial fibrillation). A surgeon creates a pattern (2) (_____) of 3) _____ in the upper 4) _____ of the heart (atria) using a scalpel or a

device that delivers heat or cold energy.

Scar tissue doesn't conduct electricity. So the maze interferes with stray electrical heart signals that cause atrial fibrillation" (Mayo Clinic).

The keys: 1) Maze, 2) maze, 3) scar tissue, 4) chambers.

2) Task:

- Students team up in bigger groups (4 people); they are given a list of topics on cardiovascular disorders (heart attack, angina, atherosclerosis, valve disorders, embolism, thrombosis, etc.). The task is to prepare a visual presentation on the chosen topic (PPT, video, drawing, etc.) and accompany it by a description. The description must include all the cardiovascular terms given in the task (the terms are formed with the help of metaphors and metonymies).

- Students may use the language of explaining, classifying, comparing and contrasting as well as make predictions, express consequences, describe a process.

Suggested topic: thrombosis.

Suggested language: blockage, blood vessel, blood clot, blood flow, plaques, atheromatous tissue, walls of an artery.

Possible description:

"Thrombosis is the blockage of a blood vessel by a blood clot. It is most likely to occur where normal blood flow is disrupted, which may be due to plaques of fatty atheromatous tissue in the walls of an artery or inflammation of the blood vessel. The clot eventually narrows or blocks the passage for blood so that the tissues beyond are deprived of oxygen and nutrients" (Parker, 2019, p. 158).

3) Planning: the teams are given a week to decide how they want to present their output (PPT, a drawing, a video) and prepare a description in English.

4) Report:

- The teams introduce their results in the target language, comment on other students' works, get the teacher's feedback. When evaluating presentations of other teams, students and the teacher are to focus on the correct use of the new language as well as linkers applied to describe the disorder in a coherent and logical way.

- After discussing the works in class, students are to choose the best presentation based on the criteria: the use of all the terms introduced in the task, coherence of the description (logical, easy to understand, correct in terms of contents), quality of the presentation.

5) Language focus: the teacher selects language areas to practise and prepares the final task for everyone to fix the knowledge.

Example of a task: put the terms given in bold in the correct place in the text.

"The process that leads to atherosclerosis begins with abnormally high levels of excess fats and cholesterol in the blood. These substances infiltrate the 1) **plaques**, forming deposits known as atheroma. This can happen in any of the body's arteries, including those supplying the brain with blood, when the result may be a stroke. The 2) **lining of arteries** gradually form raised patches known as 3) **fibrous caps**. These consist of fatty cores within the 4) **flow of blood**, covered by 5) **atheromatous deposits**. The plaques narrow the space within the artery, restricting the overall 6) **tissues** to 7) **arterial wall** beyond the site. They also cause turbulence that disrupts the flow of blood, and the eddies over the plaque surface make the blood more likely to clot. The major risk factors for atherosclerosis include smoking, a diet high in saturated fats, lack of exercise, and excess weight" (Parker, 2019, p. 157).

The keys: 1) lining of arteries, 2) atheromatous deposits, 3) plaques, 4) arterial wall, 5) fibrous caps, 6) flow of blood, 7) tissues.

4 CONCLUSIONS

The modern cardiovascular terminology is one the most difficult medical terminology systems. Its development reflects the constant progress of medical science. Among the effective ways of term-formation is the semantic method which includes metaphoric and metonymic transfer. Both metaphors and metonymies help to give nominations to new phenomena and objects, redefine the existing terms, reflect the

surrounding reality. While metaphors are based on similarity and show the interconnection between special and commonplace knowledge, metonymies are based on contiguity or association and show interrelation between objects/processes/phenomena of professional realia. These peculiarities of metaphors and metonymies can contribute to a better and faster understanding of cardiovascular terms by medical specialists. It means that such terms might facilitate the language learning process, providing positive outcomes for students in classes and during tests, increasing students' motivation and helping them further on in life when they are to build successful communication with foreign colleagues and patients.

The present paper introduces a task for medical students to learn and use cardiovascular terms formed with the help of metaphoric and metonymic transfer. The aim of the task is to teach students special knowledge by means of the English (foreign) language. To achieve our goal, we apply CLIL methodology and the framework of a task-based approach. The task contains the description of activities relevant for each stage, possible answers and keys.

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