

Development of Critical and Creative Thinking Skills in CLIL

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Abstract

CLIL offers such a learning environment where learners get a chance to use their cognitive skills and to construct their own knowledge. They are intellectually challenged to transform information, to solve problems, to discover meaning using creative thinking. For meaning-making learners use especially the following thinking skills: analyzing, differentiating, organizing, classifying, comparing, matching, synthesizing, guessing, evaluating and creating. This kind of learning works to develop flexibility in their thinking.

In our study several techniques enabling development of critical thinking skills in the CLIL context are introduced. Critical thinking skills can be supported and developed systematically e.g. via an application of the tasks offered by the revised Bloom's taxonomy. Statistically significant increases of critical and creative thinking skills in CLIL can be achieved using various proven techniques, e.g. via De Bono's six thinking hats, SCAMMPERR technique, Lotus blossom technique or mind-mapping. These techniques have proven to be efficient with both younger and older learners via action research at a higher educational institution and at a primary school. Examples of qualitative data from the evaluation of this inventive CLIL course are presented.

Key words

CLIL, aims, learners, constructivism, thinking skills, critical thinking, creative thinking, Bloom's taxonomy, SCAMMPERR, Lotus Blossom, De Bono

Introduction

In our study we follow two educational trends that for almost two decades have resonated in the Slovak educational system and in our response to them we suggest how their synergy can act to the benefit of the EFL learners.

Firstly, since democracy began in Slovakia, there has been a challenge to reform the traditional curriculum- and teacher-centred education and turn it into humanistic education focused on the learners. These reform needs were described and reflected in several educational studies, e.g. in Zelina's THV (creative-humanistic) model or KEMSAK (acronym for cognitivisation, emotionalisation, motivation, socialization, axiologization, creativization) model (Zelina, 1996, p. 11 - 15). Subsequently they were developed into the Millennium project and the National programme of education for the next 15 - 20 years in Slovakia which was authorized by the Ministry of education in 2001. Due to the gap caused by strong ideological restrictions in Slovakia before 1989 one of the main emphasises of this yearning after reform has been the development of

learners' thinking skills. Teachers were encouraged to focus more on development of cognitive and noncognitive functions of students than just on the results of their learning.

According to Zelina's models the aim of cognitivization is to teach a person to explore, think and solve problems. Zelina brought to the attention of teachers several taxonomies of thinking skills, e.g. B. S. Bloom's taxonomy, as well as a group of strategies of cognitivization of students. Especially the heuristic methods facilitate in developing divergent thinking skills. A certain kind of cognitive-affective-heuristic model was used in ESP, e.g., at the Faculty of International Relations and Political Sciences UMB, Slovakia (Kaliský, 2011). Zelina suggested that all cognitive functions, especially the so-called higher thinking skills (analysis, evaluation, creativity) should be developed in all school subjects at all age groups (Anderson & Krathwohl, 2011). This challenge has been encouraged also by the influence of the constructivist theory of learning into school practice.

The second trend has been the impetus penetrating from the European context to implement CLIL methodology into foreign language teaching since 1994. CLIL offers a new type of learning focused on the integration of various facets of learning. It uses a foreign language as a medium for meaningful communication of specific content under natural conditions. It has the real potential to stimulate learning because it refers to authentic situations of acquiring knowledge from various subjects via foreign language (Gondová, 2011). The students do not learn a language only for the sake of language learning but to find out new information in the target language and to think in that language. According to Pokrivčáková (2011, p. 29) these are the positive sides of CLIL, "in CLIL the foreign language loses the position of being the content of learning but it has become a natural medium of communication of *new* content" (Pokrivčáková, 2008, p. 11).

As one principle of CLIL methodology is its learner-centredness, the CLIL curriculum presents a synergy of the teacher's plan with the learners' authentic needs. Thus the aims of CLIL are multiple as it focuses on learning a foreign language while simultaneously learning specific subject content as well as on other important life skills all the time respecting the individual learning styles and intelligences of the learners.

Based on good practice in Hungarian schools, Dalma (2013, p. 62) expressed her opinion that CLIL should be considered to be a constructivist approach to learning, where the emphasis is put from the teacher to the learner. "Some kind of cognitive challenge is present in the situation where the active involvement of the students is necessary."

The aim of our study is to offer some suggestions, verified in an action research, how teachers' efforts to respond to both of the above described challenges can actually work together and support each other. According to Chamot and O'Malley (1994, p. 41, 44), in CLIL due to the integration of academic content with language, the development of critical thinking skills seems to be associated with the development of language functions. E.g. the content activities that require critical and creative thinking skills require also more complex language and richer vocabulary to be used. So if properly projected while keeping in mind all the nuances of developmental stages and the principles of cognitive theories and of constructivism, CLIL can be a potentially fertile context for reaching both of those aims. On the other hand, CLIL can become a dry methodology if not focused on learners, their autonomy and their own construction of new concepts either in natural or social sciences or some kind of art. Several techniques have been experimented with and the tests proved that the know-how combining CLIL and the development of critical and creative thinking skills is feasible.

Note: As the first version of our curriculum focused on the development of thinking skills in CLIL was prepared in 2001, we adopted the theory of higher thinking skills according to Bloom's taxonomy. Due to the newest scientific discoveries, brain science has not proved the theory of lower order thinking skills being simpler than the higher order thinking skills. It is assuming that all of the thinking skills are relatively independent of each other (Kagan, 2005). So we have decided to change the concept "higher thinking skills" and substitute it with the term "critical and creative thinking skills". By critical thinking we mean "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action" (Scriven & Richard at a conference in 1987).

CLIL – a way of constructing one's own knowledge

Let's start with a statement that the CLIL methodology represents an effective type of learning context where learners get the chance to use their cognitive skills and to construct their own knowledge. In order to prove this a glimpse into the theory of language learning is inevitable.

The process of learning is a kind of 'mystery', provoking a variety of disciplines to study it. It seems to consist of a phase of educational input, then a phase of learning itself in the 'black box'- the mind of the learner - and finally a phase of educational output. Attempts to explain the connections between input and output and the process of language learning were accomplished by at least

three learning theories: behaviorism, cognitivism and constructivism (Alviárez, Romero, Pérez & Delmastro, 2010, p. 137).

Behaviorism focused on the relationship between what goes into and comes out of the learning process, it did not study the 'black box' obviously associated with consciousness of learning itself. Behaviorists viewed language learning as a process of diligent training, memorizing and passively repeating some parts of texts. Though drilling has some value in language learning, the CLIL methodology with its main focus on the specific content and not on language seems to not prefer this type of learning.

On the contrary, **cognitivist psychologists** emphasised the active role of the language learners in meaningful communication and the processes going on in the mind during learning. Application of cognitivism in lingvodidactics resulted in the start of a communicative approach to language learning (Richard & Rogers, 1986). As CLIL originated from focusing on the learner's needs, cognitive categories such as meaning and purpose of all the communication during CLIL lessons is of prior importance.

Cognitivism has been supported by discoveries in cognitive neuroscience showing that the brain learns best when challenged to 'survive' – socially, economically, emotionally, and physically (Jensen, 2005; Zull, 2006; Susa, 2006; Johnson & Taylor, 2006). The key to being more educated is growing more synaptic connections between brain cells and not losing existing connections. These connections allow learners to solve problems and figure things out. Jensen (2005) describes a set of seven preconditions dramatically influencing learning that is applicable to CLIL learning: a) engagement - getting and sustaining student's attention; b) repetition - priming, reviewing and revising; c) input quantity - capacity, flow, chunk size; d) coherence - models, relevance, prior knowledge; e) timing - time of day, interval learning; f) error corrections - mistakes, feedback, support; and finally g) emotional states - safety, and state of dependency. Challenge, stimulation, repetition and novelty are absolutely essential for making sure that students will graduate from CLIL with an "enriched" not just "baseline" brain. CLIL teachers need to trust the process of learning, supplying learners of all ages with chances for new experiences (Zull, 2006, p. 3-10).

The contribution of **constructivism** is that it emphasises the process of language acquisition in learner's minds especially due to interaction with other people. It investigates the learner's own construction of a new concept based on previous knowledge challenged via the provision of a rich learning environment offering authentic incentives connected to the life of the learner. Learning 'happens' by considering new information, comparing it with previous

experience, knowledge and schemes, adapting and transforming them so that they make sense in terms of what the world already knows.

In constructivism there can be distinguished at least three streams (Průcha, Walterová, & Mareš, 2008, p. 105 – 106):

a) *Cognitive constructivism* focusing on the individual learner, on what happens in his/her brain when addressing problems. The learner should attempt to find for himself/herself the meaning, rules, schedules, missing information, etc. Although the moment of discovery of the world is important, it does not totally exclude reproductive learning. The effectiveness of the process of construction depends on the degree of autonomy and initiative of students in designing their own hypothetical meaning of concepts, reviewing and verifying them. The student is an active subject in the educational process, responding to new information either by refusing or integrating them. Only he/she can actively adopt them, sort them, organize them, analyze them and construct his/her own reply.

b) *Social constructivism* emphasizes the social dimension of learning, i.e. the vital role of social interaction and culture in the process of knowledge construction. According to Vygotskij (1978), social interaction is the precondition for the development of cognition. Social constructivism confirms the activating effect of revealing the content in cooperation with other students.

c) *Pedagogical constructivism* represents a synthesis of the previous two approaches. It combines their positive features and prepares their educational application, e.g for CLIL.

The idea of viewing CLIL as a kind of constructivist learning is based on the assumption that CLIL methodology requires an *active construction* of one's own knowledge and personal meanings for the learner (Kovács & Trentinné Benkő, 2011; Wang, 2011). CLIL lessons normally contain situations/tasks with some kind of cognitive challenges in which the active involvement of students is necessary. The emphasis is shifted from the teacher to the learners who have to be active and to think more about the contents. They have to build up knowledge for themselves. According to Alviaréz et al. (2010) constructivism “ensures meaningful learning acquisition especially via reading-in-English as a process.”

Learners' involvement in constant *social interaction* is a core feature of CLIL. Social interaction in CLIL, supporting the construction process, takes the form of discussions or exchanges of ideas. Obviously, social interactions in pairs or groups increase the benefits from a CLIL course. The effect of CLIL is reinforced especially if the teacher considers activating learning through activities reflecting various learning styles and multiple intelligences of the all learners in the group.

A standard CLIL lesson gives students the privilege of the educational challenge and novelty. Its input should be enriched by seeing the world with

'different glasses' offered by the foreign language as well as by its new ways of expressing reality and discovering previously unknown cultures, by its novel approach to various school subjects abroad, etc. Students create their knowledge in interaction with their social environment which also affects them and they in turn have an impact on their environment.

Teachers aware of constructivist learning processes provide CLIL students of with strategies that assist their autonomous learning, e.g. by using analogies, summaries, semantic networks, conceptual maps, portfolios, etc.

Of course, there are several dangers that might prevent CLIL from actually being an active construction of new knowledge. A bad practice of CLIL might look like a traditional translation lesson. Another danger is if CLIL teachers focus only on the intellectual side of language learning. According to Švec (2008, p. 55), "constructivism views learning - teaching as a process where learning comprehension is achieved more effectively through relevant practical experience. It is filled with more purpose and meaning and more influenced by social and cultural contexts. It is not purely cognitive, theorizing or speculative, it is less based on abstract principles and precepts. It means acquiring new unmediated experiences."

So a good CLIL teacher pays attention to – what neurology underlines - creating a stimulating learning environment enabling positive emotional state of learners (Jensen, 2005). Emotions can stimulate the learner's brain chemically which will help them to more effective recalling of knowledge. The precondition of learning happening in CLIL is that CLIL teachers themselves are enthusiastic about their profession, smile, tell true stories, show off a new CD, read a book, get students involved in real life matters, music or drama. Novelty and variation in time, materials, access, expectations, support in the learning process, instructional strategies, such as the use of computers, field trips, guest speakers, pair and group work, games, student teaching, journalizing; multi-topic, multi-status and multi-age projects – all of these can contribute to *active* learning. Novelty potentially prevents boredom which is more than just annoying also for CLIL students, it may actually develop their brain connections.

Taylor (2006) offers a whole range of ideas supporting the construction of knowledge in CLIL lessons including energizers; problem solving techniques; presentation of meta-cognitive strategies to improve the memory and information retrieval; visualization(mnemonics, peg words, music, discussion, pictures, mind-maps, graphic organizers, posters); peer teaching, co-operative work, interrupted and repeated solution seeking; episodic strategies (changes in location, circumstances, use of emotions, movement, novel classroom position (field trips, music, guest speakers, journal writing, projects, peer teaching;

quizzes, small group presentations, structured timed tests, real life studies); procedural strategies integrating movement; or reflexive strategies.

Some techniques supporting development of critical/creative thinking skills in CLIL

As was mentioned above, one core feature of CLIL is that its learners construct their own learning through using their cognitive skills. They are intellectually challenged to transform information, to solve problems, to discover meaning through creative thinking. For meaning-making learners use the following skills: classifying, comparing, matching, guessing; for analysing: differentiating, organizing, attributing. This kind of learning can contribute to linguistic and non-linguistic gains and the flexibility of their thinking.

Flexibility of thinking is the result of educational interconnectedness of content, topic, variety of skills and learning styles. New types of subjects emerge. According to Coyle et al. (2010) in order to structure a new subject, teachers of different disciplines have to climb out of their respective mindsets grounded in chemistry, economics, geography and physics.

There is whole range of techniques and tools that have the potential to enable the development of critical and creative thinking skills in the CLIL context. Problem solving and heuristic educational techniques demand the highest level of student's autonomy. For the purposes of CLIL for teenagers and adults, the following techniques, tools and ideas we tested have been selected: Bloom's taxonomy (the revised version), brainstorming and brain writing, various graphic organizers, eg. mind maps, SCAMPERR Think Tank technique, De Bono's idea of thinking about thinking, Lotus Blossom method, etc.

Of course the use of these techniques and tools itself does not guarantee the development of critical and creative thinking skills. Its choice should always be based on specific learners' needs analysis, on their authentic life situations, and even on considering the variety of students' multiple intelligencies and their different learning styles.

The most important stimulus for the development of authentic interaction in CLIL lessons stems from using productive questions that develop learner's thinking skills. Our CLIL experiences are consistent with those of Gondová (2012, p. 23) that questions stimulate the development of divergent thinking and evaluation skills, based on the serious argument that "The existence of various communicative structures and productive questions open the space for interaction among pupils and they are one of the decisive factors contributing to acquiring higher cognitive skills and communicative competence" (Gondová, 2011, p. 36). Cameron & McKay (2010, p. 15, 23) in their methodology of creative teaching also underline the role of problem-solving tasks and open-ended

questions asking „Why..“ or „How...“ even with young learners. By these cognitively challenging tasks the learners are stirred up to use more language and to involve knowledge about other content than just language.

The group of educational tools and techniques that develop thinking skills represents an open category. Those mentioned in this study were selected based on recognition by several educational and psychological experts and on the evidence that they proved to be efficient, appropriate and feasible ways of supporting critical and creative thinking (e.g. Turek, 2008, p. 268, 279). We started to use them first in the university in the beginning of the Millenium. Later on their age-relevant form has been applied also to the primary and lower secondary level.

There has been also another pragmatic reason for their selection. It is the evidence of thinking development as well as language learning results they produce by “encouraging learners to produce spoken or written output helping them to think through ideas, to express them, to share knowledge, to give feedback, review ideas, to adapt and refine ideas and to negotiate solutions.” (Dale, Van der Es & Tanner, 2011, p. 121).

Here is a brief description of some reliable tools that might be effectively used in a CLIL course:

1. Both **Bloom’s Taxonomy of Educational Objectives** (Bloom, Englehart, Furst, Hill & Krathwohl, 1956) and later on Anderson & Krathwohl’s Revised version of Bloom’s revised Taxonomy of Educational Objectives (2001) distinguish – though in a slightly different form - the following six distinctive categories of cognitive objectives:

Remember: Can the students remember the content?

Understand: Can the students explain the acquired content?

Apply: Can the students transfer what they have learned and apply it in a different situation?

Analyze: Can the students break the acquired information into parts and see what are the connections among them?

Evaluate: Can the students synthesize the acquired information, create an opinion about it and argue for their evaluation of it?

Create: Can the students create anything new out of the input given?

Bloom’s taxonomy sees the human mind as a two-dimensional matter where on the one hand there are the types or categories of subject matter content, and on the other hand, processes of what is to be done with or to that content. Bloom’s taxonomy not only defines the thinking skills, but thanks to its elaborated system of questions it directly facilitates their development. It

supports the development of both overlapping areas – of thinking skills and language skills, and thus it is of high importance for CLIL courses.

Questions used in this taxonomy are a demonstration of the use of language resources for the development of thinking about the specific contents. This combination was exactly what our CLIL students benefited most from. The questions proved to be useful tools in planning CLIL tasks, especially in the phase of processing the new input.

2. One way of organizing information in a visual way is the use of **mind-maps (concept maps)**. Mind-maps can function “as visual representations and organizational tools that help learners (re-)organize input by noting down information” (Dale, Van der Es & Tanner, 2011, p. 95, 268). They are considered to be one sort of graphic organizers facilitating students’ learning by expressing the information in a new, visual way. They can function as an input technique, activating the students and reminding them of their prior knowledge - a visual representation or note-taking tool helping students to (re)organize their language and ideas. Of course they can be used as an output of the process of students’ thinking or a meaningful way of revising.

Mind-maps function as a necessary visualised scaffolding (structured support) of students’ CLIL learning, important especially for young learners (Cameron & McKay, 2010, p. 15). Once the knowledge is acquired the scaffold offered by the teacher or teaching material can be removed. Scaffolding techniques (reception scaffolds, transformation scaffolds, and especially production scaffolds expecting the learners to produce something new) are dependent on the use of higher thinking skills. According to our experience, mind-maps in the phase of educational input and output were useful not only with teenagers and adult learners, but also with younger learners, e.g. during teaching/repeating vocabulary.

As mind-maps are quite well covered in many materials, we are not going to describe them in more details.

3. **Lotus blossom** - invented by Y. Matsumura, Director of the Clover Management Research (Michalko, 2003, p. 3) - is another simple graphic organizer that has proved to be an effective way of stimulating creative thinking skills for generating problem solving ideas in CLIL. It is a creative method which name is derived from the analogy of a flower developing its petals. The name is very fitting because the final result of creative thinking, expressed verbally, shows a flowery bloom (see the table below). The thinker starts at the center of the ‘flower’ by stating their central theme or problem. They continue by finding eight sub-problems. The ideas are entered in the 3x3 grid / respectively 9x9. The

next very important stage is choosing each of these 8 sub-problems and developing each of them into eight more ideas (either more detailed problems or solutions).

4. **SCAMMPERR** is a brainstorming method helping learners to generate and share new ideas during their process of solving problems/tasks in CLIL lessons (Turek, 2008, p. 267). It can function as a scaffolding of output production. It helps learners to use more fluent written or oral expressions. Normally people might be shy to show their opinions. So that is why techniques expecting everybody to answer the questions and share their opinions in the group are important. Of course the simplest way to do it is to ask appropriate cue questions.

The author of SCAMMPERR, A. F. Osborn (according to Zelina, 1996), expressed the basic principles of this method in nine points. Later B. Eberle (2008) formulated them into the English mnemonic list of questions stimulating the production of new ideas. The first stimulus is the question how to create a new idea/solution/product based on the expertise that one/a group has. The learners are prompted to think about the answer by the help of nine activating questions/instructions:

Substitute: Are there any parts of our solution/idea that can be replaced?

Combine: Can our solution/product combine with any other ideas to produce a new idea?

Adapt: Are there any ideas that can be borrowed and applied in our situation?

Magnify /Minimize: Are there parts of our idea/solution/product that can be magnified or minimized?

Modify: Can anything in our idea be modified?

Put it to some other use: Can we use the idea in another situation/with other learners?

Eliminate: Should we eliminate any parts of our solution/idea?

Rearrange: Is there any better order/hierarchy for our ideas?

Reverse: Should we consider reversing the order/importance of any ideas/solutions?

SCAMPPERR enables deeper thinking via seeing the complexity of challenges, problems or ideas. It was originally intended for executives, economists, today it is used as a teaching methodology. Its application in discussion and group problem solving situations used in CLIL resulted in producing a range of new invented ideas of CLIL students.

5. **E. De Bono** (1982, 1985) is generally (e.g. by Turek, 2008, p. 78) considered to be the author of a systematic set of heuristic strategies developing divergent, even lateral thinking skills, known as CoRT (Cognitive Research Trust) program of creative thinking. In our CLIL course, we used specifically De Bono's method of "Six Thinking Hats" which is especially suitable for searching alternative solution. In the past it was used successfully in various firms, e.g. in IBM, Nestle, British Airways etc. It focuses on helping learners to think about their thinking and distinguish various kinds of thinking:

The "*white hat*" thinking represents mere facts, neutral information. This type of thinking requires an objective and neutral approach.

The "*red hat*" thinking legitimizes emotions, feelings, as well as intuition that should not be judged.

The "*black hat*" thinking allows space for negative assessment, judgment, opinion, why something is not functioning. The learners point out errors in thinking, method, design, or incorrect assumptions. It is an objective attempt to point at negative elements of the solution.

The "*yellow hat*" thinking is a positive, optimistic and constructive evaluation. It is the opposite of black negative thinking. It consists of logical and positive practical considerations, but may involve also dreams, aspirations and hopes. It aims at trying to logically find the things and events of their cost and benefit. It is a constructive thinking process coming up with specific ideas, including operational and implementation plans. Its goal is efficiency. This thinking

therefore should not be confused with a positive euphoria (“red thinking”) or with the creation of totally new ideas (“green thinking”).

The “*green hat*” thinking opens a fertile, creative, emerging, provoking lateral thinking thoughts flow. It is not based on assessment, but on an effort to move from the previous thoughts to reach a totally new way. This thinking opens the door to lateral thinking – the kind of thinking where ‘a pattern-switching’ happens within ‘a patterning system’.

The “*blue hat*” thinking represents an ability to think as a guide, manager, conductor managing the thinking process, thinking about thinking, organization of thinking. It is responsible for preparing summaries and conclusions from the discussion.

Research results of teaching CLIL developing critical and creative thinking

CLIL curriculum focused on development of critical and creative skills has been tested at the Faculty of Education, University of Matej Bel in Slovakia for about 14 years by now. In the beginning it existed in the form of ESP (English for Specific Purposes) and a certain CBI (Content Based Instruction – Brinton, 1997) course. Since its beginnings it has had a double aim, namely the development of critical/creative thinking skills functioning in the context of the subject content, and development of foreign language communication skills and specialized vocabulary. The content was chosen according to authentic needs of the students. The vocabulary was directly connected with the field of study or profession of the learners, or even (in some cases) with their personal perception and experiences.

Five methods and tools aimed at development of both language skills and critical and creative thinking described in the previous part have become the central building blocks of the ESP/CLIL curriculum at the University of Matej Bel, Slovakia, since 2001. Recently one more educational method – portfolio - has been added as the umbrella assessment method of students’ learning results (Calabrese & Rampone, 2007, p. 5). Mind-mapping was used also in EFL lessons focused on content with younger learners. The reason of this choice was to achieve the highest level of authentic learning possible. The authenticity principle has been consistently followed throughout the CLIL lessons.

To assess the impact and eligibility of this kind of our first CLIL course (in 2003), we decided to apply action research, observation, questionnaires, testing, diary-notes and feedback. For the first two years, standardized Torrance’s pre-tests and post-tests of creativity were used to find out the increase of fluency, flexibility and originality (Torrance, 1972). As the quantitative and qualitative analysis of the acquired data showed (Hanesová, 2003), the idea behind this course was proved to be feasible and effective. There was proved a statistically

significant increase in both content knowledge and creative thinking skills of our students (together with regular increase of language skills) in comparison with the controlled group. Such positive results encouraged us to continue in the implementation and innovation of this kind of a CLIL course. Since then the action research and students' evaluation portfolio by our CLIL students has always showed us positive results of students' authentic thinking (Hobbs & Keddle, 2010).

As a CLIL course has to be focused on learners, their assessment of individual methods used in a CLIL course is the most important phenomenon in its evaluation. Here we present a brief overview of a) students' opinions on the advantages and disadvantages of several thinking tools and techniques used in CLIL; and of b) problems and some results of students' decision making process via the above-described techniques as they were recorded in our qualitative research recently (2012/13, 2013/14). (A more precise description of the flow of this CLIL course and the analysis of the results is going to be published in a separate publication). As these are quotes written by our students, they are noted in italics:

Brainstorming of students' opinions about the application of Bloom's taxonomy

Pros: Most students expressed a positive attitude toward the use of Bloom's taxonomy. According to them though it is a challenge, it offers a lot of ways how to learn how to formulate questions and problems, solve problems, analyze them and categorize them. *It was useful for developing creativity, for the evaluation process, for the real work in schools, and for comparing the levels of education. It is a good system with a lot of important information with very clear instructions, gives a good overview about thinking skills and really helps to develop them. Bloom's taxonomy really helps learning, to focus attention, to better understand the curriculum, to use one's intelligence, to train one's mind.* Some students commented even on the linguistic benefits of using this taxonomy as *it develops professional vocabulary and the skill to work with longer texts in the foreign language.* Least, but not last, some learners described it as *a funny inventive idea.*

Cons: Basically there were three kinds of comments about negative sides of working with Bloom's taxonomy. Students with lower command of English, especially not sufficient entrance vocabulary, mentioned that *it was very complex concept, really hard to comprehend it, especially as if we did not know many of those verbs. A rich vocabulary was needed.* About 5% of comments were about the complex nature of the taxonomy itself. These students had problems with the levels of thinking and distinguishing among them. They said they were *not able to remember and comprehend it all.*

Brainstorming of students' opinions about the application of Lotus Blossom

Pros: Most students found this method interesting and even entertaining: *It is a simple method which can be used in the case of difficult problems. It helps to define problems, to analyze them, to find its sub-problems and causes, to look for a lot of varied solutions. It motivates the learner to search for adequate information. It leads to many ideas and hopefully to the correct solution. Its graphic expression makes it really clear, intelligent and it brings transparency into problems, it creates a system of problems and solutions. It can be applied for solving problems in school. It is a very interesting, entertaining technique, it can be used as an after-school activity. Linguistically, it develops learners' vocabulary.*

Cons: Generally very few notes about disadvantages of this method were reported. *It is a very useful tool for every situation.* Some commented on the time demand, especially in case if they had not had enough previous knowledge about the central problem. For some students there were too many options for opinions, too many mini-decision-making processes. There was no clear principle according to which to choose the solution.

Brainstorming of students' opinions about the application of DeBono's Thinking Hats

Pros: This method was praised by all students. *It helps to simply understand the problem, to analyze it and openly discuss it, to see it from six different angles, even to see it in a 'good light', to solve it by finding lots of solutions to the problem. It facilitates learning, being able to summarize ideas, it develops intelligence. It leads to acquiring new skills and knowledge, new vocabulary, general communicative skills, listening to English text. Its positive side is that it allows focus on one type of thinking but also to change the different types. It is funny, transparent, very interesting.* Several students appreciated especially the red emotional hat, the opportunity to be straight about their thoughts. Others liked the information about various types of thinking. *When used in groups it opens personality characteristics in different situations. It can become a very big personal help, but it can support team work too. This method is applicable to many situations, facilitating in solving various problems, even complicated private and family situations. It can bring a fast solution.* One of the most interesting comment was: *You have to do it with an "open" head and you have to tell the truth.*

Cons: Some students were hesitant in finding solutions as *not every opinion can be the right one for everybody.* For them it is *a rather complex method, demanding time and hard thinking.* Also for it to be of benefit *it requires a group of people and the ability to listen to their opinions.* Linguistically, *it requires a rich*

vocabulary as to understand the explanatory text about the method. Several students struggled with *the distinction between several methods*.

About a third of students commented it *was time consuming*. What is very obvious in most of the responses of the learners is that they confirmed the real emphasis of De Bono's thinking program – his emphasis on time investment in real thinking: "The simple habit of trying to think more slowly can make a big difference to our effectiveness as thinkers. It is part of the general skill of thinking" (De Bono, 1982, p. 10).

Brainstorming of students'solving problems processes (mainly via Lotus Blossom)

In Lotus Blossom students could choose the central problems for themselves. Here are some examples of their decisions: *the quality of Slovak university education system, its teaching, few presentation and practical experiences, bad cooperation among student, few excursions, few interesting activities, weak motivation of students, bad technical equipment, bad organization of the school timetable*.

Some students decided to answer the question: *What would I change at the universities?* Here are their suggestions: *teaching process (less time spent at school in the afternoon, more practice, good real aims, good rules, more selection of subjects, more interesting subjects, recreation and fun), more sport activities for students, better equipment in the classrooms, higher quality of the canteen services, changes in university teachers (sensible, effective, patient, fair, qualified, communicative, friendly) and their capability (flexibility, readiness, communicability, practice, teaching, experiences, feedback, illustrations), better communication (between professors and students, between our professors and foreign professors, between schools, about countries, more English courses, between our students and foreign students), more emphasis on feedback (student – student, student – teacher, realistic opinions, open communication, experience of life, teacher – students, positive energy), more hope for the future of students after graduation*.

An interesting question was *What causes bad study results of students'?* Answers ranged from *bad motivation (because of parents, no reason why to learn, drugs, social environment, no hope for the future, lack of interest in school, spending free time in other interest)* to *bad education system, social crisis, no motivation, not enough money and not enough materials*.

For example, the students dealt with the problem/subproblem of *how to raise the motivation of the students*. In the result of their brainstorming a lot of good ideas are listed: *to provide choices, enlarge the challenge, allow to experience success, give tasks that are easy but also challenging, make some practical exercises*

– make it real, help students feel that they are wanted, ensure opportunities for students, help students to find personal meaning and value in the material, give frequent positive feedback, create open and positive atmosphere, use a variety of assessment not only tests, avoid stereotypes, create space for exhibitions, apply new concepts of teaching, offer opportunities for foreign mobility, foreign lecturers, interesting projects, benefits for the students, new educational tools, practical internships abroad, more practice and less theory, more electives and more humour.

Other questions/problems suggested by the students themselves were: *Schools should be creative, Why are our students so isolated – so few international relations? How to improve the financing of schools? Schools do not educate for real life, We need more professional teachers to teach us more practice than theory, It is necessary to change the methodological approach to teacher education, Students would like to have a trendy school.*

Conclusions

Our study was based on the assumption that CLIL courses may be a good opportunity for schools to implement effective, efficient, activating ways of learning, aiming for the development of both critical and creative thinking skills in the context of a specific subject as well as of communicative language skills. CLIL has the potential to allow the development of learners' autonomy via the **construction of their own knowledge**.

The tools and techniques applied in CLIL and described in this study and evaluated via both our older quantitative and recent qualitative research helped not only to develop the learner's thinking skills but also enabled an individualized approach towards them as well as gaining a team-building experience. There was space created where the students could determine, define and even openly communicate issues that really mattered to them. Some of them appreciated the support of their schoolmates.

Via the example of our CLIL courses focused on multifold aims involving the development of critical and creative thinking we showed that they could be adequate to meet learners' needs. Not only according to statistical results, but mainly according to the university students' own evaluation of these CLIL courses they had a positive contribution to learners' thinking skills as well as their linguistic ones. Thus the aims of the CLIL courses were achieved to a reasonable level. It means that the idea of CLIL methodology focused on learners, integrating content knowledge and skills as well as on language skills is not an illusion but a feasible option for schools.

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