THEORETICAL GROUNDS AND METHODOLOGICAL PRINCIPLES OF IMPLEMENTING THE PEDAGOGICAL TECHNOLOGY CLIL

Abstract. The article deals with theoretical approaches and principals that are on the ground of popular and well-known pedagogical technology CLIL. With the help of this studied technology students see the learning process as an interesting path. The founder of this approach was D. Marsh but this educational principal has gained enormous popularity among a lot of the scientists and its fame is still growing. In the article it has been analyzed, that the approach of CLIL is based on the theory, that the performing learning algorithm can easily be used on both languages provided that both languages are sufficiently advanced. The “Iceberg Theory” has been studied as a part of “Common Underlying Proficiency”. That means that the students should possess while their learning process bilingual skills which are universal. For both languages. The theories of S. Toukomma and I. Cummins have been searched as well. Doe to these theories the relationship between cognitive ability and individual bilingualism can be represented with thresholds with a certain level of bilingual competence. The main problem in applying the Threshold Theory is to define precisely the level of linguistic competence which a child has to achieve in order, firstly, to avoid the negative consequences of bilingualism and, secondly, to gain the cognitive benefits of his/her bilingualism. We have also analyzed BICS and CALP theories. It was found that according to J. Cummins theory, students’ cognitive/academic language competence is not developed enough for them to cope with the demands of the curriculum which is designed for monolingual majority language children. D. Coyle’s Language Triptych was paid attention to in order to explain how language
Keywords: CLIL, monolinguals, bilinguals, students, teaching process, language learning.

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Информация из статьи:

## Теоретичні основи та методологічні принципи імплементації педагогічної технології CLIL

Анотація. Стаття розглядає теоретичні підходи та принципи, що лежать в основі популярної та відомої педагогічної технології CLIL. За цією технологією учні сприймають процес навчання як цікаву подорож. Засновником цього підходу був Д. Марш, але цей педагогічний принцип здобув величезну популярність серед багатьох науковців і на сьогодення його популярність продовжує зростати. У статті проаналізовано, що підхід CLIL базується на теорії, згідно з якою ефективний алгоритм навчання може бути легко використаний у обох мовах, за умови, що обидві мови достатньо розвинені. До уваги бралася «Теорія айсберга», що аналізувалася як частина «Загальноосвітнього рівня владдіння мовою». Визначено, що для успішного навчання учні повинні мати двомовні навички, які є універсальними для обох мов. Також були розглянуті теорії С. Туккома та І. Каммінса. Згідно з цими теоріями, зв’язок між когнітивними здібностями та індивідуальним білінгвізмом може бути представлений за допомогою порогових значень з певним рівнем білінгвальної компетенції. Основна проблема у застосуванні теорії порогів полягає в тому, щоб точно визначити рівень мовної компетенції, якого має досягти дитина, щоб, по-перше, уникнути негативних наслідків білінгвізму і, по-друге, отримати когнітивні переваги від свого білінгвізму. Ми також проаналізували теорії BICS та CALP. Вони допомогли пояснити, чому система освіти для дітей з мовних меншін іноді дає збої. Виявилося, що згідно з теорією Д. Каммінса, когнітивна/академічна лінгвістична компетенція учнів недостатньо розвинена, щоб впоратися з вимогами навчальної програми, розробленої для одномовних дітей з мовної більшості. Для пояснення того, як використовується мова в контексті CLIL, було розглянуто мовний триптих Д. Койла, який поділяється на мову для навчання, мову для навчання, мову через навчання.

Ключові слова: CLIL, monolingualism, bilingualism, students, teaching process, language learning.
**Problem Statement.** Quite often, in foreign language classes, children learn words, grammar, and do exercises, but they don’t see the language as having any practical meaning. In their minds, they need a foreign language for exercises and tests, not for real communication. As a result, motivation decreases, a language barrier and fear of making mistakes are formed. Lack of practice leads to passive knowledge of the language: «I understand everything, but I can’t say anything».

CLIL solves this problem. In a lesson where this technology is used, language is no longer the goal, but a means of learning another subject, meaning that students see that they can learn new and interesting information with the help of a foreign language. Learning a language immediately becomes more meaningful because it is used to solve specific problems here and now. So, what is CLIL and why should it be implemented at school? – thus is the question this article deals with.

**Analyses of resent studies and publications.** The methodology of CLIL and its approaches have evoked the interest of many researchers and recently great number of articles have appeared devoted to this study. Among the researches of CLIL we may name J. Cummins, D. Coyle, Ph. Hood, D. Marsh, A. Malyers, M.Swain and D. Sygmund.

**Aim of the article** is seen in the try to describe theoretical approaches and methodological principles of realization of the pedagogical technology CLIL.

**Presentation of the main research material.** CLIL can adjust to traditional school curricula – learning one specific subject through a foreign language or a second language – as well as existing independently of them: studying several disciplines at once in an interconnected way. CLIL is also suitable for educational projects, e.g. developing geographical maps, finding solutions for recycling, etc. It is only necessary to bear in mind that CLIL implies the simultaneous learning of a subject and a foreign language, and one cannot ignore their interrelation when using CLIL [2, p.4]. The aim of learning in this case is not only to learn new information but also to apply it in real life [5, p.19]. Teachers should not limit themselves to teaching only the subject or only the foreign language, but they can vary the inclusion of content and language in the learning process according to their preferences: subject teachers to the subject they teach and foreign language teachers to the language they teach. In other words, there are two approaches in implementing CLIL [6, p.28]:

1) subject-oriented, in which learning is focused on the content of the discipline;
2) linguistically-oriented aims directed to learning a foreign language through the subject matter.

Let’s look at the theoretical statements that justify CLIL pedagogical technology.

In the human cognitive system, language concepts are not separate but interact and are subject to transfer. For example, when lessons are taught in English, this
does not mean that only the part of the brain responsible for that language is
developed in the process.

Definitions and concepts learned in one language are transferred to another
language. A person who has been taught to use a dictionary in English can also use
a dictionary in Spanish; a learner who has been taught the multiplication algorithm
in English can also perform the multiplication operation in Ukrainian.

Thus, a concept or an algorithm for performing the operation can easily be
used in both languages, provided that both languages are sufficiently advanced. This
reasoning leads to the idea of the existence of «Common Underlying Proficiency»,
i.e. bilingual skills which are universal for both languages.

The cognitive model of bilingualism authored by J. Cummins is called
«Iceberg Theory» [3, p. 23; 4, p. 15]. The theory is based on two icebergs having a
common underwater part. The two languages are different in their manifestations,
so the above-water parts of the iceberg are isolated. The underwater part of the
iceberg is a unified whole, i.e. both languages function through the same central
operating system of the human brain.

The Common Underlying Proficiency model of bilingualism can be
characterised as follows:
– regardless of the language used, the thought process that accompanies
speaking, reading, writing or listening is carried out in a single «centre». If a person
is proficient in more than one language, their thought processes take place in a single
centre of thought;
– bilingualism and multilingualism are possible because the human brain has
sufficient capacity to «store» several languages. People can easily communicate in
more than one language;
– information processing and learning skills can be developed in one or two
languages. School learning and cognitive development can successfully take place
both monolingually and bilingually, with a common centre of thought;
– the learner must have a good command of the language of instruction in
order to solve the cognitive problems that arise during the learning process;
– speaking, writing, reading and listening skills in the first and second
language have a positive effect on the development of the cognitive system as a
whole. However, if the skills and abilities in the second language of instruction are
not sufficiently developed, the cognitive system will not work at maximum
efficiency;
– if one or two languages are not fully functioning or not sufficiently
developed, this can have a negative impact not only on learning, but also on the
cognitive development of the learner as a whole.

A large amount of research proves that the closer a person approaches mixed
bilingualism, the more likely they are to have cognitive advantages compared to
monolinguals. Consequently, the question arises as to under what conditions does bilingualism have a positive, negative or neutral effect on cognitive processes, and how long does it take for a person to gain cognitive advantages from bilingualism?

A theory that explains the interdependence between cognitive ability and the degree of bilingualism of the individual is called «threshold theory». It was developed by Skutnabb-Kangas, Toukomaa and J. Cummins. According to this theory, the relationship between cognitive ability and individual bilingualism can be illustrated using two thresholds. Each threshold represents a certain level of bilingual competence.

The first threshold is the level of bilingual competence that an individual has to achieve in order to avoid negative consequences of bilingualism. The second threshold is the level that needs to be crossed in order to manifest the possible positive effects of bilingualism.

Trying to explain the theory we can image of a three-storey house. On the two sides of each storey are stairs, symbolising the two languages of man. The stairs imply the constant development of the bilingual individual and the progression from floor to floor. On the lower floor of the house are those individuals whose linguistic competence is underdeveloped or not age-appropriate. At this stage bilingualism can have a negative impact on cognitive abilities. For example, a learner who cannot cope with the learning tasks set in his or her mother tongue (L1) or with the language learnt (L2) will inevitably encounter problems with his or her academic performance. In the middle floor of the house, there are learners whose language competence has been developed in only one language and whose level of development corresponds to the requirements of the age group. This group includes learners who can only communicate in one of the two languages. Partial bilinguals have practically no advantage over monolinguals in terms of cognitive development.

It should be noted that in this case bilingualism does not have a significant positive or negative impact. At the top level are the so-called «balanced» bilinguals. At this level, learners have language competence appropriate to their age group in two or more languages. For example, learners can learn in either of the two languages and successfully absorb the learning material. At this level, the positive impact of bilingualism on cognitive ability can be seen.

With well-formed, age-appropriate bilingual competence (formed bilingual competence), bilingual learners have a clear cognitive advantage over their monolingual peers.

Studies by researchers such as Bialystok, Clarkson & Galbraith, Clarkson, Dawe and Cummins support this theory. Dawe conducted a pedagogical experiment in 1983, with bilingual children aged 11 to 13. Their mother tongues were Panjabi, Mirpuri and Jamaican. Dawe proved the group of subjects to have both upper and lower thresholds on tests aimed at detecting deductive mathematical reasoning. As
the language competencies in the two languages developed, the deductive mathematical reasoning skills of the learners developed [3, p. 28; 4, p. 19].

«Threshold theory» is applicable to describe the learning process on a bilingual basis. It also explains the reasons why learners whose mother tongue is not English (e.g. immigrants in the US) cannot reach a certain level of language competence development in the second language and as a result cannot benefit from «weak» forms of bilingual learning. In such a situation a low level of language competence development (e.g. in English) has a negative impact on learning outcomes.

The main problem in applying the «Threshold Theory» is to pinpoint the level of language competence a child needs to achieve in order, firstly, to avoid the negative consequences of bilingualism and, secondly, to benefit cognitively from their bilingualism. It is also not clear at what «linguistic height» the upper limit of a given level becomes the lower limit of the subsequent one. What linguistic skills need to be developed and to what extent to reach the higher threshold?

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Subsequently, the «Threshold Theory» was refined. The first step was to investigate the relationship between the two languages of the bilingual. J. Cummins put forward the Language Developmental Interdependence hypothesis [10, 12].

This hypothesis suggests that the level of competence in a second language that a child achieves depends largely on the degree of development of his or her first language. When competence in the first language is poorly developed, achieving bilingualism seems rather difficult. Research by A. Huguet confirmed the hypothesis using Spanish and Catalan as examples. Thus, 12-year-olds who speak Catalan better than others also know Spanish better, and vice versa.

Parallel to the first direction of refinement of the Threshold Theory, a second one evolved. It is characterized by distinguishing in the foreign language competence of a bilingual the differences between language proficiency at the level of everyday communication and at a higher level of using the second language in the process of learning and cognitive activities.

J. Cummins, on the other hand, proves that there are two. He found that the spoken (foreign or second) language of everyday communication can be acquired within two years, whereas it takes students 5 to 7 years or more to develop the more complex language skills needed to learn the subjects. In California, Hakuta et al.
determined that it takes three to five years for immigrants to acquire oral English skills, while it can take four to seven years to acquire academic English skills. Thus, this sounded the alarm bell for US English-speaking schools teaching immigrants in immersion programmes, where only one year of English language teaching was supposed.

A good command of simple communicative skills (e.g. talking to a shop assistant) may conceal a lack of development of the academic language needed to meet cognitive needs in the subject lessons. The language used when playing in the schoolyard is very different from mathematical language, for example: «calculate the obtuse angle of a parallelogram using a protractor, then plot the diagonal between the two obtuse angles and find out whether this produces equal triangles».

J. Cummins distinguished two aspects of language competence – «BICS» (basic interpersonal communicative skills) – basic everyday communicative skills and «CALP» (cognitive/academic language proficiency) – cognitive/academic language competence which is needed outside everyday communication situations.

BICS is present where there is a contextual support for understanding a second language. «Context-sensitive» face-to-face situations provide non-verbal support that facilitates understanding. Facial expressions, body language, immediate feedback, cues and prompts complement verbal communication.

CALP, on the other hand, is present in «context-unconditioned» situations in which higher-order thinking skills such as analysis, synthesis, evaluation, comparison, hypothesis-making, classification, prediction and generalisation are required, language is not context-unconditioned. CALP is formed and developed through learning.

The difference between BICS and CALP can be shown by comparing them to playground language and school language. Playground language is direct, supported by facial expressions, gestures and other forms of non-verbal communication. Its purpose is to engage in social, playful activities. In contrast, playground language is more abstract, educational language used to teach mathematics, physics, biology, chemistry, literature, etc.

Highlighting the differences between BICS and CALP has made a difference and has influenced both the learning process and the assessment of learning outcomes. Teachers, even more than academics, believe that awareness of the differences between BICS and CALP is a new way of looking at teaching methods, which will enable them to provide the right amount and quality of language support that children need. In addition, teachers in the United States, for example, have come to the conclusion that exaggerated requirements in testing bilingual children are dangerous.

The BICS/CALP theory does not claim to be a general theory of language formation and development, it is applicable only in the context of second language
subject teaching. Nor has it been designed to determine the point at which reading in a second language should be introduced in lessons or subject learning in English. The BICS/CALP theory has been unfairly criticised because it did not address many conceptual concepts and contexts that it was not, in principle, intended to discuss. In view of its limited applicability, it is important to show for which situations it can be used and for which it cannot:

The BICS/CALP theory can be applied to situations where children who seem to be fluent in a second language do not cope with curriculum tasks in that language. It outlines the «two-stage» process of second language acquisition. Children and adults improve their knowledge of a second language continuously, step by step, rather than in leaps and bounds. This development of language competence is comparable to a gradual increase in television broadcasting. Bilinguals’ language competences are constantly developing, interacting, dynamic and a complex system. They are not dichotomies which are divided into unrelated parts.

2. The BICS/CALP theory provides an opportunity to understand and explain the results of previous research in the field of bilingual subject learning. However, many scholars argue that the theoretical hypothesis of the existence of BICS/CALP does not indicate how the difference between them can be precisely defined and rigorously tested, so they are difficult to operate in research.

3. Terms like BICS and CALP are imprecise, simplistic and often misused. These are hypothetical terms some tend to regard as real entities. These terms can be used to classify students, especially if they have more developed BICS than CALP.

4. The relationship between linguistic and cognitive development is not straightforward, i.e. the development of one competence has a non-linear effect on the development of the other. The relationship between cognitive and linguistic development is influenced by various factors (e.g. public policy, social stratification, level of culture and motivation, context, educational institutions, family and society)

5. The sequential nature of acquiring first BICS and then CALP is the typical route for immigrant children learning a second language. However, this order is not always absolute, sometimes there are exceptions (e.g. a scholar who can read research papers in a second language but cannot speak it).

6. CALP explains pupils’ ability to perform well on tests of school subjects (erudition tests) in a second language as they relate to specific, traditional, learning activities. Educational practice supports the «middle class» view that BICS/CALP theory gives special status to those styles of language spoken by educated «middle class» people and therefore downgrades the spoken style of «working class» language, which was not the intention of J. Cummins. Knowledge of this theory has convinced many educators not to prematurely admit students with poor language skills into mainstream English classes (such as Spanish-speaking children in the US), so there is no «language discrimination» effect.
7. Oral communication sometimes requires cognitive skills as much as learning skills. For example, a well-thought-out logic of statements, the use of metaphors and other abstractions are also needed in spoken language.

8. Different socio-cultural contexts require the application of different appropriate language clichés and thinking skills, school is not the only context in which the development of higher-order language skills takes place.

BICS and CALP theory have helped to explain why the education system for minority language children sometimes fails. For example, in the United States, special curricula have been developed and implemented to ensure that minority language learners reach a level of English that enables them to communicate with their peers, teachers and engage in classes with majority language learners. They are transferred to mainstream classes when they achieve superficial fluency in English, i.e. they have developed sufficient language competence (BICS) to be able to study in the mainstream curriculum. However, such children do not learn well afterwards. According to J. Cummins theory, their cognitive/academic language competence is not developed enough for them to cope with the demands of the curriculum which was designed for monolingual majority language children.

J. Cummins believes that in the process of bilingual education «general skills of proficiency», i.e. the universal skills of a bilingual person should be well developed. These can be developed in the first or second language, or in two languages simultaneously.

J. Cummins in his methodological guidelines for CALP application distinguished the following three directions: cognitive, academic and linguistic [3, p. 23; 4, p. 45].

Cognitive: learning should be conducted at a high level of complexity in which thinking skills such as evaluation, inference, generalisation and classification are developed.

Academic: Language learning should be integrated into the content of curricula so that learners implicitly learn the language of specific subject areas.

Linguistic: critical language awareness should be developed on two fronts: linguistic and socio-cultural.

BICS/CALP theory is further developed in the form of a two-factor model of communication [1, 32].

The first factor describes the measure of contextual support provided to learners in communication. Communication is contextualised when it is supported non-verbally, in particular by body language. For example, facial expressions, gestures, posture, intonation facilitate understanding. An example of contextually conditioned communication is the dialogue between two children who can hardly use each other's languages, but can communicate freely through gestures, body language and other forms of non-verbal communication. It is not uncommon to see two young children speaking different languages, playing together without any
difficulty. Communication is context-unconditioned when it is only verbal, i.e. there is little hinting or non-verbal information to aid understanding of the meanings of words. An example of context-unconditioned communication is communication in the school classroom, where meanings are conveyed by words whose meanings are derived from precise definitions given by the teacher or presented in a book.

The second factor describes the necessary level of development of cognitive skills required to carry out communicative activities. Cognitive communication is present in the classroom when there is rapid processing of large amounts of information of high complexity. Communication that does not require cognitive skills occurs when a person has sufficient language skills to be able to communicate casually. An example would be talking on the street, in a shop or at a stadium, where information processing is relatively simple and straightforward.

Superficial language proficiency, or in other words, basic communicative skills for everyday communication, manifests itself in contextually conditioned, non-cognitive communication skills. More complex cognitive/academic language competence (CALP) is context-independent cognitive communication.

J. Cummins assumes that fluency in the second language develops independently of its development in the mother tongue. On the contrary, context-independent, cognitive communication in both languages develops interdependently and can be improved either by using one or both languages. Thus, this theory shows that bilingual education will only be successful if learners have sufficient linguistic competence in the first and second languages to work in context-independent, cognitively demanding situations in the classroom.

When planning the learning process on a bilingual basis, the two-factor model described above should be relied upon.

The teacher should take full account of the learner’s linguistic development, experience and understanding of a topic. In these circumstances, he or she may engage with learners in activities in which higher-order cognitive skills are developed, but contextual support may be provided as needed. The cognitive «Threshold Theory» and the «Two-Factor Communication Model» are the theoretical basis for the modern pedagogical technology of bilingual CLIL teaching.

Choosing subject content is relatively easy, it is hard to understand how to teach it. Learning content is more effective when learners' cognitive abilities are well developed. Consequently, CLIL teachers need to actively involve learners in the learning process: helping them to become aware of what they are learning and how to get the most out of it.

The best known and most widely used description of cognitive ability is Blum’s Taxonomy. Benjamin Blum created a hierarchy of six thought operations, ordered from lower to higher order. According to this system [6, p.27], lower-order thinking operations involve the knowledge of defining, naming, describing and
using objects. Higher-order thinking operations are analysis, synthesis of knowledge, which are necessary when learners use new information in a given situation, separate information into parts or assemble ideas into a whole in order to understand information better and create something new. The use of Blum’s taxonomy is one of the CLIL techniques to facilitate learners’ understanding of the learning process.

Undoubtedly, learners’ cognitive abilities often outstrip their foreign language abilities. As a consequence, when implementing CLIL the dilemma arises of how to balance the development of both. D. Marsh [5, p. 32] quotes Snow, Mehta and Genesee (2008) on the distinction between content-obligatory language (the level of language proficiency required to learn a discipline) and content-compatible language (the language used both to facilitate learning of subject content and to achieve the set linguistic-cultural objectives of the programme), which allows consistent implementation of content and foreign language learning objectives. That is, learners need to have a certain level of foreign language competence in order to learn the subject content and teachers need to structure the linguistic material so that it is learned at the same time as the subject. Teachers need to link subject and linguistic goals in order to plan lessons. D. Coyle [2, p.5] has developed the Language Triptych to explain how language is used in a CLIL context, which is subdivided into Language of learning, Language for learning, Language through learning.

**Language of learning** – language needed to learn certain content, e.g. mathematics, engineering, biology, etc. In this case, the choice of language structures, terms, functional vocabulary will depend on the subject content.

**Language for learning** – vocabulary, structures, functions to learn: are necessary for learners to be able to work within the language they are learning. This aspect is the most important because learners find it difficult to use a language that is new to them. Teachers should support the use of the foreign language through various techniques, e.g. group work, pair work, debates and discussions, etc.

**Language through learning** – the language that is mastered in the CLIL learning process. Here, it is very important to help learners advance their learning by giving them the opportunity to become aware of new linguistic aspects, consolidate them and expand their linguistic knowledge, skills and abilities. The acquisition of a foreign language takes place systematically because language and speech units appear in different specific contexts. That is, through thematic texts (and other types of material) which need to be provided with grammatical structures and functions so that learners know how to use them correctly in the communication process.

**Conclusions.** As it can be considered from the given material, the process of teaching students according the CLIL approach requires good level of language command and cognitive abilities to analyze the staff in the foreign language. But its
usage will allow students to communicate more effectively with each other using a foreign language; expand their intercultural knowledge; develop communication skills in a foreign language in natural settings; develop students’ thinking and unlock their creative potential; increase students’ motivation and confidence; train all language skills; improve language competence and natural speaking skills; develops interest in different languages and their use in different spheres of life.

References: