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CLIL in Theory and Practice
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vedoucí diplomové práce (supervisor):
Doc. PhDr. Jarmila Mothejzíková, CSc.

Zpracovala (author):
Dana Gablasová

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CLIL in Theory and Practice

Dana Gabřasová

Univerzita Karlova v Praze
Katedra anglistiky FF
Mšeno 1, Palác 2, Praha 1, 116 38

I declare that the work presented in this thesis is, to the best of my knowledge and belief,
original except as acknowledged in the text.

Dana Gajdosová

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Contents

Contents.....	4
List of Figures	6
List of Tables	7
Abbreviations and Notation Conventions.....	8
1 Introduction.....	9
1.1 The Aims of this Thesis	11
1.2 Literature Sources	12
1.3 The Structure of the Thesis	14
1.4 Terminology	15
2 Content-Based Instruction and Content and Language Integrated Learning	22
2.1 History of CBI and CLIL	22
2.2 Definition and Classification of Content-Based Instructions and Content and Language Integrated Learning	25
2.2.1 Definition of content	29
2.2.2 Content-driven versus language-driven courses.....	31
2.2.3 Evaluation and Assessment.....	33
2.3 Conclusion	36
3 Empirical Part.....	37
3.1 Experimental Study	39
3.1.1 Previous research	40
3.1.1.1 Issues in bilingual processing	41
3.1.1.2 Numerical processing.....	44
3.1.1.2.1 Monolingual numerical processing	45
3.1.1.2.2 Bilingual numerical processing.....	46
3.1.2 Outline of the experiment	49
3.1.2.1 Hypothesis forming.....	51
3.1.2.2 Participants	52
3.1.2.3 Apparatus	53
3.1.2.4 Stimuli	53
3.1.2.5 Design.....	55
3.1.2.6 Procedure.....	56
3.1.2.7 Data treatment.....	58
3.1.3 Results.....	60
3.1.3.1 Effects of training.....	60
3.1.3.2 Errors	61
3.1.3.3 Effects of the language of training on the performance	63
3.1.3.4 Generalisation of trained to novel (semi-trained and untrained) problems	66
3.1.4 Discussion of the results.....	68
3.1.4.1 Effects of training.....	68
3.1.4.2 Effects of the language of training on the performance	69
3.1.4.3 Generalisation of knowledge across the problem types.....	72
3.1.5 General discussion	73

3.2	Survey	77
3.2.1	Preliminaries	78
3.2.2	Purpose of the study	80
3.2.3	Design of the questionnaire	81
3.2.4	Subjects	84
3.2.5	Data analysis	84
3.2.6	Results	85
3.2.6.1	Attitude towards the CLIL subject (Items 6, 7, 8, 9)	85
3.2.6.2	Learner strategy and action (Items 4, 10, 11, 12, 13, 14, 15, 16, 18, 20, 25)	87
3.2.6.3	Language anxiety (16, 22, 23, 24, 25, 26, 32)	90
3.2.6.4	CLIL and assessment (Items 9, 27, 28, 29, 30, 31, 32)	94
3.2.6.5	CLIL and general achievement in language and content (9, 34, 35, 36, 37, 38)	97
3.2.7	Discussion	98
3.2.7.1	Attitude towards the CLIL subject	98
3.2.7.2	Learner strategy and action	99
3.2.7.3	Language anxiety	100
3.2.7.4	CLIL and assessment	102
3.2.7.5	CLIL and general achievement in language and content	104
3.2.8	General discussion	106
4	Conclusions	109
4.1	Methodological conclusions	109
4.2	Empirical conclusions	110
	Summary (Slovak)	113
	Bibliography	122

List of Figures

Figure 1	Mean reaction times for trained problems.....	60
Figure 2	The distribution of errors among the participants.....	62
Figure 3	Mean reaction times: trained, semi-trained and untrained problems	63

List of Tables

Table 1	Factors influencing the subjects' performance	52
Table 2	Experiment design.....	56
Table 3	Means and standard deviation according to the day of experiment	61
Table 4	T-test: trained and semi-trained problems.....	66
Table 5	T-test: trained and untrained problems	67
Table 6.....		86
Table 7	Selected results of correlation analysis.....	86
Table 8	Selected results of correlation analysis.....	86
Table 9.....		87
Table 10	Selected results of correlation analysis.....	88
Table 11.....		89
Table 12	Selected results of correlation analysis.....	89
Table 13	Selected results of correlation analysis.....	90
Table 14.....		91
Table 15	Selected results of correlation analysis.....	92
Table 16	Selected results of correlation analysis.....	92
Table 17	Selected results of correlation analysis.....	93
Table 18	Selected results of correlation analysis.....	93
Table 19	Selected results of correlation analysis.....	94
Table 20.....		95
Table 21	Selected results of correlation analysis.....	95
Table 22	Selected results of correlation analysis.....	95
Table 23	Selected results of correlation analysis.....	96
Table 24	Selected results of correlation analysis.....	96
Table 25.....		97
Table 26	Selected results of correlation analysis.....	98
Table 27	Selected results of correlation analysis.....	98

Abbreviations and Notation Conventions

CALLA	Cognitive Academic Language Learning Approach
CBI	Content-Based Instruction
CLIL	Content and Language Integrated Learning
CLT	Content Language Teaching
CoBaLLT	Content-Based Language Learning and Teaching
D1	Day 1 of the experiment
D2	Day 2 of the experiment
EFL	English as a Foreign Language
ESL	English as a Second Language
L1	Language one (i.e. e. a person's first language)
L2	Language two (i.e. e. a person's second language)
n. s.	Not significant
RT	Reaction time
SD	Standard deviation

English-English
English-Slovak
Slovak-English
Slovak-Slovak

} In section 3.1, the testing condition in the following form: Language of training-Language of test

1 Introduction

With the natural globalisation processes underway, various forms of bilingual (or multilingual) education have enjoyed growing attention. In Europe, with the strengthening political and cultural integration, the innovations in language education are in focus of not only language professionals but also of political decision-makers.

The practical need to enhance the 'plurilingualism' of the EU citizens, an intention formulated in the White Paper on Education and Training from 1995, can be seen as a clear impetus for the increased interest in the foreign language curriculum. The Paper proposed that, gradually, each European citizen should be able to use also two community languages other than his/her mother tongue (known as the "MT+2" plan) (White Paper on Education and Training, 1995). This aspiration also reflects the shift in understanding of knowledge of more than one language as a privilege of the elites (be it economical, intellectual or other elites) to be received at special schools or via special programmes. Instead, this education should extend to include ordinary citizens.

However, it could be argued "that contemporary languages education has often failed to provide platforms for learning which suit a broad range of people, young and older" (Marsh, 2003: 3). As a result, the traditional approach to language education must be re-considered.

The failure to reach not only the MT+2 plan, but the crisis in the language education in general are often pointed out by language learning theoreticians (cf. Van de Craen, 2001, Marsh, 2003). Despite an increasing number of years and amount of time devoted to the language learning, the current approach fails to produce the desired results leaving considerable flaws in the school-leavers' language competence. As David Marsh aptly summed up, "[t]oo many people leave school being able to use very little of the languages which they spent so many hours learning" (Marsh & Langé, 2000: 3). He further points to the paradox of the European Union language learning practice: "The MT+2 formula has

been recommended alongside claims that foreign languages are not sufficiently taught or learned in schools and that considerable investment in this field is called for" (Marsh, 2003: 3).

In view of the given reasons, many countries within the EU engage in developing and implementing innovative processes into their language education. Following the successful Canadian experience with immersion classrooms, various forms of Content-Based Instruction (CBI) have been promoted in order to improve the situation. Content and Language Integrated Learning (CLIL) has been developed as an European version of the North American immersion education in order to reflect and respect the specific conditions of the European environment. Thus, "CLIL has emerged as a pragmatic European solution to a European need" (Marsh, 2003: 3).

In the countries with a long tradition of conventional language teaching (i.e. translation-based methods), much anxiety accompanies the implementations of the various forms of CLIL. This concern can be recognised in the following main areas: first, the possible interference and affect on the first language (including the threat of the first language attrition), second, the interference with the content knowledge and consequently with the academic attainment in general, and finally, the interference with the pedagogic process itself when the cognitive load¹ of the whole process may become unduly magnified for the students

However, despite this intensive interest in the content-based instruction (accompanied by both positive and negative emotions), there is a surprising lack of serious research on the topic. This is a point strongly emphasised by various prominent theoreticians of CLIL/CBI (cf. Marsh, 2003, Dickey, 2004, Van de Craen, 2001, Dalton-Puffer, 2002, Stoller, 2004) who point to the total prevalence of the material focusing on the policy aspects and possible outcomes of CBI rather than on the empirical research of the underlying mechanisms. Neglecting the research of these issues, however, might

¹ Cognitive load is usually defined as a factor determined by the combination of language intensity and content intensity, cf. Dickey, 2004.

appear as highly unprofessional and perhaps irresponsible, especially with the prospect of CLIL becoming the new official language education trend in the whole of the EU.

1.1 The Aims of this Thesis

The aim of this thesis is twofold: First, it attempts, having reflected upon the aims of CLIL and other CBI-related methods, to engage in an empirical experiment which will explore a particular aspect that lies at the core of CLIL, i.e. the learning of exact facts in foreign language and the cognitive mechanisms associated with this process. The scope of the study and the nature of the experimental research allow to draw only limited conclusions (referring only to a particular age group, proficiency level, etc.) Hence the aim of this experiment is to become one part of the systematic inquiry into the underlying conditions (variables) of the CLIL learning process, so that this understanding can help us to manipulate the conditions (variables) of this process in order to enhance the outcomes, i.e. the attainment of the learners. However, as the cognitive abilities of the learners cannot be disassociated from their psycho-social experience, a survey was designed to identify particular areas of student beliefs that can enhance our understanding of functioning of CLIL from the student experience.

A secondary purpose of this thesis is to point to the need of greater interdisciplinarity in the study of language learning so that results from various neighbouring disciplines can be brought together to allow for better-informed solutions to issues in language education. More specifically, this thesis combines research from the fields of applied linguistics and psycholinguistics. De Bot (2000), in an article from the *Annual Review of Applied Linguistics* explains the relation in the following terms:

The psycholinguistic interest would be in the processing mechanisms involved in using more than one language and the acquisition of additional languages. The A[ppplied] L[inguistics] interest would be in understanding why language learners behave the

way they do, or in other words, what the mechanisms are for L2 use and acquisition. Ultimately, interest also lies in interventions that change and improve those mechanisms. This interpretation means that multilingual processing can be defined as the intersection or shared interest across psycholinguistics and AL. (De Bot, 2000: 225).

A similar view has been expressed by H. H. Stern, a prominent theoretician of language education, who maintains that “the concept of foreign language learning is necessary in order to design the language teaching” (Stern, 1983: 410). Similarly, Thomas Scovel in his chapter on “Multiple Perspectives on Singular Language Teaching” stresses the importance of interdisciplinary foundations (i.e. from the field of linguistics, psycholinguistics, language pedagogy, etc.) in order to formulate a valid language teaching theory. (Scovel, 1987)

1.2 Literature Sources

The literature used for the theoretical background of this thesis can be divided into three main categories according to the field and methodology of research: a) the official documents concerned with language education planning and design, b) language pedagogy and applied linguistics, c) disciplines related to language learning – psycholinguistics and neurolinguistics.

(A) The policy papers and official documents concerned with language education in the EU

These materials cover the realm of European language planning policy, namely:

- a) Its political aims and reasoning behind them; cf. Marsh & Langé, 2000, Marsh, 2003
- b) The practical implications and intentions for language teaching practice formulated there; cf. White Paper on Education and Training, 1995, Maljers et. al., 2003.

As follows from the nature of these documents, the arguments of the language specialists are often joined with political rhetoric and thus the outcomes must be viewed with caution as the best political intentions may not be (readily) compatible with the practice as known to the language practitioners and researchers. Thus, these documents will be used predominately in order to demonstrate the significance of the turn towards CLIL and CLIL-related methods (and the urgent need of further research into these methods) the discussion of which is no more limited to the few specialists in the field, but earned attention also among the policy and decision-makers.

(B) Language pedagogy and applied linguistics

These sources are primarily focused on two areas:

- a) Research on CBI (CLIL) - oriented language practice, i.e. research designed to describe the situation and practices in content-based classroom from various perspectives, the description of the various types of CBI (CLIL) models and programmes and their distinguishing features, cf. Crandall, 1994, Short, 1993, Stoller, 1997.
- b) Outcome-oriented research of the students' attainment with respect to CBI and related methods, i.e. research "oriented towards determining results of language learning and acquisition on part of the pupils" (Dalton-Puffer, 2002: 14). In this research, the variables (various features) of the teaching and learning process are studied in order to optimise the outcome of learning, cf. Genesee, 1994, Dalton-Puffer, 2002, Short, 1993, Stoller, 2004.

However, although this research in certain aspects resembles the practice of psycholinguistics, it is rarely experimental. Instead, various non-experimental research methods are employed such as observation of the classroom interaction, interviews with students and teachers, surveys and questionnaires, diaries, etc. As a result, the research is limited to the assessment of the learning situations that already took place, but cannot be used to inform us about the possibilities that have not yet been realised.

- c) Research on affective factors such as learner belief and learner anxiety which argues for the impact of the affective variables on the learner attainment or behaviour.

(C) Psycholinguistic (and neurolinguistic) research

These sources cover primarily the following two areas:

- a) Issues in bilingual processing, cf. Grosjean, 1998, Perani et. al, 1996, Fabbro, 1999.
- b) Numerical processing in both monolingual and bilingual subjects, Spelke and Tsivkin, 2001, Dehaene et. al, 1999, Frenck-Mestre & Vaid, 1993.

The research from this field focuses on the identification of variables in the process of language acquisition (learning) and the consequent processing and production of the learner's second (foreign) language. In this respect, the psycholinguistic research oriented towards language teaching practice can be used to complement the knowledge gained within the limits of the applied linguistics methodology. Thus, instead of assessing the language teaching and learning practice as it is (in all its complexity), here, in an experimental setting which allows to control for various conditions, it is possible to separate a certain variable (feature, characteristic) of the learning process, and observe and test its functions in detail – what it may depend on, what conditions may influence its functioning or outcomes. In this way, the psycholinguistic research attempts to untangle the complex cognitive, physiological and mental processes present in language learning.

1.3 The Structure of the Thesis

The thesis comprises a theoretical part (section 2) and an empirical part (section 3). It is divided into four main sections: The first section introduces the topic and aims of the thesis. It also provides a brief classification of the literature sources used in the thesis (1.2). Finally, it includes a terminological discussion of terms used in the thesis (1.4).

The second section presents the discussion of the Content-Based Instruction (CBI) and Content and Language Integrated Learning (CLIL). In this section, the origins of the two approaches are described (2.1) and a further classification of various CBI models is

provided (2.2). In relation to CLIL practice, special attention is given to the issue of evaluation and assessment (2.2.3).

The third section consists of two quantitative studies, an experiment and a survey. First of these, the experimental study (3.1), engages in a controlled experiment which targets the cognitive processing of students in the CLIL setting. After the survey of relevant literature (3.1.1) the study describes the details of the experiment (outline of the experiment, design, procedure, participants, etc.) and the data treatment (3.1.2). Further, the results are presented according to observed phenomena (3.1.3). The following section provides the discussion of the results describing in detail the reactions of the subjects (3.1.4). Finally, the general discussion summarises the most important findings and their implication for the language teaching practice (3.1.5).

The second study, a survey (3.2), focuses on CLIL from the perspective of language learners. It describes the role of affective variables in the learning process (3.2.1). The following section describes the design of the questionnaire used in the survey including the reasoning behind particular parts (3.2.3). The data obtained from the survey are analysed using both descriptive and inferential statistics allowing to measure the general trends and further explore the relations between particular learner beliefs and/or learner actions (3.2.6). The discussion of results according to a particular topic (3.2.7) is followed by a general discussion, which summarises the main findings and tendencies (3.2.8).

The final section offers the conclusion combining the theoretical information and empirical findings from the sections 3.1 and 3.2

1.4 Terminology

The area of second language acquisition is of high interest to several disciplines. Fruitful as this multiple perspective might be, each discipline brings with it its own methodology and perspective as well as its terminological conventions. This results in many terminological ambiguities and clashes. As this study uses sources from various

disciplines, the most frequently appearing terms require some clarification. Some of these terms and their definitions are still the subject of heated debates among the scholars. There is not enough space to report the discussions with their finer points in detail; neither is it the aim of this thesis. Therefore, only very limited working definitions which will clarify the use of the terms in this thesis will be provided.

Bilingualism

Most of the terms in question are in one way or another related to the issue of bilingualism. *Encyklopédia Jazykovedy (Encyclopaedia of Linguistics)* defines a bilingual as a person who is characterised by 1. equal command of two languages (“rovnako dobré ovládanie dvoch jazykov”) or by 2. the ability to make oneself understood in two languages (“schopnosť dorozumieť sa v dvoch jazykoch”) (Mistrík et al. 1993: 90).

The first definition in Mistrík et al. (1993) is related to the age of acquisition and the manner of acquisition of the two languages. It assumes that the two languages were typically acquired in early childhood and were acquired simultaneously in a manner analogous to the acquisition of the first (native) language (cf. Stern, 1983). However, although in the past, the first definition prevailed, today a broader definition of a ‘bilingual’ and ‘bilingualism’ is used (i.e. the sense closer to the second definition in Mistrík et al., 1993). This is due to the fact that “the perfect, full, or equal command in language (equilingualism, ambilingualism, balanced bilingualism) is extremely rare. The command of language is hardly ever balanced” (Stern, 1983: 15 cf. also Fabbro, 1999, Fabbro, 2001, Grosjean, 1998, Dudok, 2002). As a result, the search for ‘perfect’ bilinguals has been abandoned, as unbalanced proficiency in the language skills in a person’s two languages has been accepted as a rather prevalent and characteristic feature. Thus the term ‘bilingual’ came on the whole to represent people who use two languages (or dialects) in their everyday lives (cf. Grosjean, 1998, Fabbro, 1999).

As already argued, bilinguals are rarely equally fluent in their two languages. This is due to the fact that they are usually influenced by the complementarity principle (cf. Grosjean, 1998, Stern, 1983), which means that they usually acquire their languages for different purposes. It was argued that bilinguals also attribute different social and emotional functions to each of the languages. Thus their fluency in a particular language may depend on the context, on the purpose of the language use as well as on with whom the bilingual is using a particular language. Grosjean further claims that "it is a well known fact that certain domains of life of bilinguals are usually covered exclusively by one language (e.g. work, religion, sports, etc.)." (Grosjean, 1998: 135). Thus, it is hard to measure a bilingual's overall language competence. Traditionally, monolinguals, i.e. native speakers of a particular language were used as a yardstick. However, as argued by Dudok, the competence of native speakers is also somewhat problematic as they are likewise known to show language dominance in certain subject areas:

Podľa rovnako rigorózných kritérií aj monolingvistov, ktorí dokonale ovládajú svoj jazyk, je tiež veľmi málo, ak takí dnes aj existujú.....Koľko je takých jednotlivcov, ktorí veľmi dobre, ba vynikajúco ovládajú svoj materinský jazyk, ale v špeciálnych komunikačných sférach sú úplnými analfabetmi a správajú sa, akoby sa ocitli pred dverami cudzieho jazyka, a ich jazyková kompetencia je na úrovni receptívneho či pasívneho bilingvizmu. (Dudok, 2002: 54).

Also, the term 'native-like' has been perceived rather intuitively, however, as is apparent, the native's mastery of language and equal fluency in all areas should not be accepted unquestioningly. Moreover, Grosjean (1998) argues against the tendency to compare bilingual and monolingual speakers, and the claim that the latter represent the norm. He maintains that bilinguals are a distinctive group of speakers-hearers whose natural linguistic behaviour (such as code-switching) should not be regarded as a deviation.

Finally, in questioning a bilingual's competence several more factors should be considered. These are mainly the manner of acquisition of the language and the stability of the bilingual's two languages (whether the person is still acquiring the language or whether this process is already finished).

It is, however, not possible to discuss all of the factors here, as the practice of language acquisition offers a vast number of possibilities. Nevertheless, the distinction between a language learner and a bilingual as appears in the literature should be briefly discussed.

A language learner is described as a person who acquires the second language in an academic setting. A bilingual, on the other hand, is a person who acquires language spontaneously in a natural environment. Although some authors attempted to argue for a qualitative difference in the language use of a bilingual and a language learner (cf. Krashen, 1987, Grosjean, 1998), it is impossible to define a clear boarder line. As no definite answer has been provided as to who is still a learner and who is already a bilingual, the current convention is to regard anybody who uses two languages on a fairly regular basis as bilingual. Therefore, it is the task of the researcher to describe as closely as possible the specific language competence (i.e. the kind of the subjects' bilingualism) of the subjects in his/her study.

First language (L1) vs. Second language (L2)

The distinction between the two terms refers to the chronology of the acquisition of two languages. The second language is thus perceived as "any language acquired later than the native language" (Stern, 1983: 13). In this respect, many authors argue for the important distinction based on how much later after the first (native) language the second language is acquired (for further details cf. the discussion on Critical Period Hypothesis in Harley and Wang, 2003). This, they claim, can account for the qualitative difference in the ultimate mastery of the second language. As the ultimate attainment is not the subject of

this thesis, the distinction between L1 and L2 will refer only to the chronology of the language acquisition.

Second language (L2) vs. Foreign language

The use of these two terms differs greatly across the disciplines and remains highly ambiguous. The distinction concerns the manner and context of acquisition as well as the later use of the non-native language.

The term 'foreign language' is used to denote "a language acquired in a milieu where it is normally not in use" (i.e. usually through instruction) and which "when acquired is not used by the learner in routine situations." (Klein, 1986: 19). On the other hand, the term 'second language' is used for the language "that becomes another tool of communication alongside the first language; it is typically acquired in a social environment in which it is actually spoken." (Klein, 1986: 19). Thus, for example, in the case of immersion education in Canada, children are learning English as a *second language* (ESL), as this is also the language of their normal communication and it is the language of the environment outside the classroom. In contrast, in most of the European countries, English is usually acquired and practiced in an academic setting in language classrooms and the learners usually do not interact socially in their two languages. Here, the learners are learning English as a *foreign language* (EFL).

Nevertheless, as Klein points out (Klein, 1986, cf. also Stern, 1983), the distinction is nowadays not easy to be made as there are many intermediate cases due to both the changing political situation and changing pedagogical approaches. A more active involvement with the language learned is therefore encouraged also outside the classroom and the education inside the classroom attempts to imitate the natural language use including the social interaction (see 2.2 discussion on CLIL and CLIL-related approaches).

Since many of the ESL teaching/learning principles apply also for the CLIL (EFL) conditions, in this thesis, the terms second and foreign language will be used interchangeably.

Learning vs. Acquisition

The distinction between foreign and second language is closely related to that between tutored (guided) and untutored (spontaneous) acquisition. It was argued that language 'acquisition' happens in a natural setting (i.e. usually, when the language is that of the community) while 'learning' is the term used to describe the acquisition of language via formal instruction (i.e. usually limited to the classroom).

However, the research on the language development of children who acquired their language via formal instruction and children who learned language in natural environment (cf. Swain & Lapkin, 1982) revealed no main effect that could be attributed solely to the conditions of learning (i.e. tutored versus untutored). Moreover, the learning methods which try to simulate acquisition and use of the language in natural conditions (e.g. CLIL and CLIL-related methods) challenge even the basic assumptions of this theory.

Although the terms are highly interchangeable (cf. Klein, 1986, Perani et al., 1996 Bialystok and Miller, 1998), a slight distinction will be observed in this thesis. The term 'second language acquisition' will be used as a general term denoting any activities or processes involved in mastering the language. In this sense, the term will serve as a hyperonym to include 'second language learning'. Second language learning will be used mostly to refer to the language acquisition which involves formal instruction, although no qualitative difference in the language mastery of the students is implied.

CBI and CLIL

Content-Based Instruction, CBI, represents an approach based on the immersion education, which stresses the naturalness in the language acquisition process. In the

language learning situation, it implies creating a natural situation in which language is both the medium of exchange and as well as the object of learning. CBI is a general term used to describe various programmes that adhere to the above-described principles. These vary in how explicitly the language learning aims are formulated and present in the organisation of the course. (See Appendix A for various terms used to describe this approach).

Content and Language Integrated Learning (CLIL) represents a specific CBI model. Nevertheless, CLIL is a specifically European phenomenon and owing to Europe's strong regional characteristics, it is sometimes perceived as an autonomous alternative to CBI rather than as one of its models. While adhering to the core principles defined in CBI such as naturalness of the foreign language learning, CLIL is adjusted to the specific European conditions in which for the majority of learners, L2 is rarely the language of everyday environment and communication. This results in specific features introduced in CLIL, which include, for example, the attention paid to the status of the learners' L1, the role of explicit formal language instruction, the emphasis on social and cultural learning in relation to L2 acquisition. For further discussion of CLIL and CBI see section 2.2.

2 Content-Based Instruction and Content and Language Integrated Learning

The Content and Language Integrated Learning (CLIL) is a specific and considerably recent form of Content-Based Instruction (CBI). In the following section, the relation between the two models will be explored: First, it will be presented from a historical perspective, second, in the section on definition and classification, the shared and distinguishing features of the two models will be discussed and finally, some of the implications that follow from the integrated language learning for research and teaching practice will be addressed.

2.1 *History of CBI and CLIL*

Content-based instruction, i.e. an instruction in other than one's own language is a very old and well-rooted concept in the history of language teaching. Historically, it can be seen as to draw on two sources: First, in the continental history, it dates back to the European tradition of learning in Latin; in the colonial history, it has its roots in the schools set by the old Colonial Powers in their dominions in order to teach the inhabitants the language of the 'mother' country. Second, it draws on the North American experience with the immersion programmes. Both of these approaches, although different in nature, contribute some important features upon which the CBI (CLIL) is based.

As it is known today, CBI appeared in Canada in the form of immersion programmes for the immigrant population. It was designed to tackle the proficiency problems of the large number of immigrant children arriving to Canadian schools. These immersion programmes were modelled on the theory of second language acquisition that claims that the second language can be acquired in the same way as the child's first language, provided that the same conditions are re-created (cf. Krashen, 1987). This

implied learning through a meaningful content, without formal language instruction, (so called 'untutored acquisition'), by imitating an example whereby the child was expected to become sufficiently proficient in the target language. Thus, in this case, instead of 'learning' which implied a formal language instruction, this form was referred to as 'acquisition' in order to emphasise the naturalness of the process.

The Canadian immersion education started in the 1970s and 1980s. From the outset, it has not acted as monolithic movement or programme. Alongside the courses in elementary and secondary schools, 'English for Special Purposes' was offered to the foreign population (usually adult immigrants). These two initiatives became later identified as the bases for the various forms of content-based instruction (CBI) that rapidly grew in popularity. The first programmes, designed mainly for employment and further education purposes, emphasised, above all, social and communication skills. Later, the programmes, having been officially implemented into primary and secondary education, focused also on teaching academic English. At this point, some of the programmes have apart from the discourse and function-oriented teaching adopted also certain elements of the formal (grammar-focused) language instructions.

In 1994, an extensive research exploring the effectiveness of the immersion programmes (Swain & Lapkin, 1982 described in Genesee, 1994) revealed major differences in students' ultimate attainment which appeared to vary according to the different learning conditions (e.g. the intensity of exposure, the age of pupils, the age of acquisition, the extent of formal instructions, etc.) The research discovered that the traditional production skills (writing, speaking) lagged considerably behind the processing skills (reading, listening), which often reached nearly native-like level among the immersed students. Among other things, this result was attributed to (a) the insufficient space the content lessons offered to students for practicing the production skills and (b) the lack of formal language teaching. Nevertheless, the majority of the programmes today continue to pay only limited attention to the 'form' as opposite to the 'meaning' (or 'function') in their practice.

In response to the apparent success of the immersion education, an increased number of attempts at similar forms of bilingual education have appeared at both, national and local levels in Europe. According to Van de Craen (2001), the term 'bilingual' education in these conditions usually implies " (1) that part of the curriculum is taught in a different language than the mother tongue, (2) that subject matter is taught in a different language than the mother tongue (3) that (traditional) language teaching continues to play a role although adapted to the specific multilingual learning situation." (Van de Craen, 2001: 1) However, as described above, while the immersion programmes placed prevalent emphasis on the meaning-oriented approach (function), the traditional bilingual education in Europe has always preferred grammar and structure oriented teaching (form) as the main vehicle of instruction and learning. Thus, the teaching of school subjects in a foreign language usually took place only after a sufficient level of proficiency had been attained and was regarded more as a practice and demonstration of the language skills, than as a means of their acquisition (Short, 1993). Furthermore, in contrast to the situation in the North America, in Europe, the taught language is not the language of the students' everyday environment and in the majority of cases it might be limited only to school. As a result, learners lack the opportunity to acquire and practice the social and pragmatic dimensions of language which would enable them to use the grammatical knowledge and communicate meaningfully in the foreign language.

As a result, taking into consideration the specific European conditions (L2 not being the language of the general environment) while having acknowledged the advantages (and possible shortcomings) of the solely meaning-oriented language teaching, a new model of CBI was developed and recommended for the use of the EU member states to enhance their foreign language instruction. CLIL, the acronym for Content and Language Integrated Learning was established and recognised as a programme of content-based instruction designed specifically to suit the European conditions.

The term itself was coined in 1995 by David Marsh of the Jyväskylä University, Finland and has since been referred to in the documents of the European Commission for

Education as an official alternative to traditional grammar oriented methods (cf. Marsh, 2002, White Paper on Education and Training, 1995).

Although it may seem that CLIL functions as a predominately technical or political term as it does not denote any particular practice or methodology (see section 2.2), the new term fulfils two important functions: political as well as the function of a general approach in language education. The first marks a new phase in the language education in the integrated Europe. The second marks a new philosophy of language education, i.e. the shift to 'learning by doing' and its recognition as a viable alternative to the traditional teaching. Furthermore, CLIL as a term also officially establishes the important change of focus within the applied linguistics/language pedagogy, i.e. the shift from teaching to learning (cf. Van de Craen, 2001).

2.2 Definition and Classification of Content-Based Instructions and Content and Language Integrated Learning

The term 'content-based instruction' is used to cover the wide range of programmes that aim at the "integration of content learning with language teaching aims"(Brinton et al, 1989: vii). Thus, in this sense, this term CBI does not define any specific methodology or model, it denotes "more a philosophy than a methodology" (Stryker and Leaver, 1997, quoted in Dickey, 2004: 11) and the term in fact refers to "a diverse set of CBI programmes" (Crandall and Kaufman, 2002 quoted in Dickey, 2004: 10).

Likewise, in Europe, CLIL fulfils a similar function of a "generic" (Marsh and Langé, 2000) term when it rather than a particular model describes an overall "education approach" (Marsh et al., 2001) that covers various methodologies and approaches which share certain essential characteristics. As Marsh maintains,

CLIL is an 'umbrella' term under which many different methodological approaches....may be placed.....It encompasses many forms of learning context in

which a language carries a special role alongside the learning of any specific subject or content....." (Marsh & Marsland, 1999 quoted in Newberry, 2005: 3).

This situation is also acknowledged in the official European policy with its broad definition of CLIL: "[A] minimum of 25% in a foreign language is required by the Council of Europe for any class to be described as a ' plurilingual CLIL class.'" This results in the existence of "many different forms and levels of CLIL, from partial use of a second language in a subject class to complete 'immersion', and from a few minutes in nursery school to full-blown programmes in upper secondary schools"(Newberry, 2005: 5).

As naturally follows from the shared origins and history of CBI and CLIL, the two models share certain general characteristics, in spite of the different forms of their implementation. These include (1) the focus on the content as a point of departure, (2) accommodation of language to L2 learners' proficiency levels with a focus on developing academic and/or professional language skills, (3) the attention to the student needs and interests. All of these are expected to deepen the motivation of the learners and to result, when viewed from a more complex perspective, in the cognitive development related to the linguistic and knowledge acquisition (Brinton et al., 1989, Jourdenais and Shaw, 2005).

Nevertheless, the two approaches, the North American and the European, also differ in several important aspects. While the usual forms of CBI rely on some form of immersion education, which is still based on Krashen's theory of language acquisition as opposite to language learning (cf. Krashen, 1987). The main aims of this education still remain the social and communication skills. In this respect, the school delivered instruction is greatly assisted by the natural conditions of the target language use in the environment outside the school. Although the academic language skills are also one of the explicit aims of this education, many programmes rely on spontaneous acquisition rather than on formal teaching, i.e. they prefer to avoid formal linguistic instruction, error correction or conscious practice of the newly acquired language skills. This follows partly from regarding the language learning aims as secondary to the content learning – a belief often predominant in the CBI programmes. Finally, as far as teaching materials are

concerned, the majority of the CBI programmes stress the use of authentic materials so as to enhance the purposefulness and meaningfulness of the language learning already inherent in the content learning.

In contrast to North American CBI which is mainly concerned with the most effective integration of language and content, CLIL advocates a more holistic approach to language learning. CLIL recognises five dimensions of the educational process: (1) cultural, (2) social, (3) environment, (4) language and (5) content (cf. Maljers et. al, 2003). These reflect the philosophy of educating students to have a 'plurilingual' attitude which includes the openness towards different cultures. This approach reflects on one hand the policy of European integration and, on the other, the psycholinguistic insight, that the learning of a language is closely related to a positive attitude towards the culture of the country or region where it is spoken (cf. Guiora, 1990, Scovel, 2000 Grosjean, 1998).

The differing political aims and reasoning result in further differences in the two approaches: While CBI and the immersion-related methods aim at the integration of foreigners into the majority society, the European CLIL attempts to enhance the European identity while preserving the cultural and linguistic heritage of each country. This has also practical consequences for the position of the first language in the curriculum (i.e. the first language development must not be affected) which makes the integration of content language and the foreign language teaching more difficult (see below). Methodologically, CLIL also acknowledges the positive aspects of the long tradition of the formal language instruction and these thus remain important features alongside the new meaning-oriented (discourse-focused) learning and curriculum designs.

The above-mentioned differences result mainly from (a) the objective differences in the learning conditions (the language of the environment, the history of language teaching depending on the 'form' as opposite to the 'function') and (b) different political visions. However, the main feature of both of the approaches that distinguishes them from each other lies in their teaching/learning methodology. The CBI/CLIL's main educational philosophy is 'learning by doing', i.e. the discourse-oriented (also implicit, meaning- and

function-focused) learning as opposite to the grammar-oriented (form-focused, explicit) learning (Van de Craen, 2001).

This discourse-oriented learning requires an approach in which all areas such as the student's personality, the overall context of cognition and learning are involved. That is allowed by the natural setting of the learning situation created above all by the meaningful content (i.e. subject-matter, topic, subject of interest) upon which the language learning is based and which is "more effective than methods that teach the second language in isolation" (Genesee, 1994: 2). This learning thus depends on the 'naturalness' of the children's learning environment. Especially in Europe, without the stimulus of the outside school L2 usage, the naturalness has to be created in the CLIL classrooms which are expected to replace the traditional language classrooms "where learners go through the often difficult process of sorting out sounds, structures, grammar or vocabulary" (Marsh & Langé, 2000: 3). As further emphasised by Marsh, "[w]hat CLIL can offer [...] is a natural situation for language development which builds on other forms of learning.[.....]It is this naturalness which appears to be one of the major platforms for CLIL's importance and success in relation to both language and other subject learning" (Marsh, 2003: 3).

This type of learning will ensure that apart from the grammatical and lexical competence (i.e. the language use limited to sentence-level), the abilities defined as "functional proficiency" (Genesee, 1994) or "communicative competence" (Dalton-Puffer, 2004, Ellis, 2004) (i.e. language on a discourse-level) will be likewise developed. These two terms refer jointly to the combination of sociolinguistic and pragmatic competence "whereby a person has both knowledge and skills for actively using the given language" (Marsh, 2003: 2). The foreign language that serves students as a vehicle of academic discussion as well as the means of communication with the teacher and with each other will thus allow for lexical (the vocabulary of the subject-matter), grammatical (the required level of academic English present in the delivery of one's opinions) as well as social and pragmatic communications skills (interaction with the teacher, among students) in a realistic discourse setting.

A further important feature of the integrated language and content learning is the stimulation of the cognitive development, i.e. the positive effect on the general mental processes (such as strategies in analysis, attention, memory processing, etc.). The evidence from psycholinguistic research suggests (positive) effect of bilingualism on cognitive processing depending on the type and level of the proficiency (de Bot, 2000, Bialystok, 1991, Perani et al., 1996) as each language encodes its structure of processing of information and its learning allows for greater practice of the processes. As Genesee maintains, in this setting “ the instructional planning is not based on some theory of language, as is often in conventional programmes. It is based on the intellectual skills and knowledge considered important for every child to acquire” (Genesee, 1994: 2).

The cognitive processing is closely related to the fluency or competence in a language, i.e. the ability to generalise acquired knowledge to new situations (see section 3.1.1.1). The integrated content and language learning encourages the learners to “experiment with linguistic form in order to communicate with one another and about academic and social matters”, in other words, it enhances the “creative construction” (Genesee, 1994: 2) (cf. also “creative learning” and “creative use of language” that is regarded as characteristic of native-like proficiency in Stern, 1983). The ability to use language creatively, i.e. to generalise the old knowledge to a new situation is characteristic of children’s acquisition of the first language and lies at the core of some of the psycholinguistic theories of second language acquisition.

2.2.1 Definition of content

The ‘meaningful content’ as a vehicle of language learning appears to be of essential importance for the CBI and CLIL-related methodologies, however, its definition is by no means straightforward. The differences are apparent especially in the dispute about the nature of the content defined in the terms of academic vs. non-academic content. While many argue with Crandall and Tucker (1990) (quoted in Met, 1999) that the content

of the courses should be clearly “academic subject matter”, on the other hand there is also a large number of researchers who maintain that content “need not be academic; it can include any topic, theme, or non-language issue of interest or importance to the learners”(Genesee, 1994: 3, cf. also Brinton et al., 1989, Dickey, 2004, Crandall, 1994, Dietrich, 2005).

Those who do not insist on the academic nature of the content advocate the using of content calculated to enhance language learning. It may for example involve sociolinguistic (social and communication skills), pragmatic (discourse and cultural awareness), cognitive functions (involving a development of mental faculties and thinking processes themselves) - all of these taught either explicitly or achieved via materials consciously selected to elicit these particular language functions. Along these lines, Met (1999) proposed that content represents “material that is cognitively engaging and demanding for the learner, and that extends beyond the target language or target culture” (Met, 1999: 3). However, Brinton et al. (1989) warn against a too loose interpretation of content as any context of language learning of interest to the learners, and she maintains that “simply ‘contextualizing’ language lessons which are organized around structures or functions is not enough.” (Brinton et al., 1989: 1). Although the discussion remains, inconclusive (as given by the varied practice) it is closely related to the discussion about the prevalent purpose of the course in which language and content are two ends of a continuum on which most of the CBI and CLIL models can be placed.

As the various practical implementations of CLIL vary into great extent in their focus and emphasis on the range, age level, scope, the ratio of content and language learning, it is impossible to speak about a single CLIL programme, and discuss its advantages and disadvantages, outcomes or mechanisms. In order to categorise these courses with a view of further research, the following three distinguishing features were suggested by Brinton et al. (1989): (a) the primary focus of the course (language vs. content), (b) the instructional format (ESL course vs. content course) and (c) the focus of evaluation (language skills and functions vs. subject knowledge). These three are closely related, however, the main distinguishing line is usually drawn between the amount of

content learning and language learning which also directly determines the focus of evaluation.

2.2.2 Content-driven versus language-driven courses

In the content-driven courses, “the content-outcomes are a driving force of instruction”(Met, 1999: 4). This is usually the case of the total or even partial immersion programmes which “are often judged successful based on student attainment of content, and may be deemed effective even though the levels of language proficiency students attain are not native-like” (Met, 1999: 5).

On the contrary, in the language-driven courses, “content is a useful tool for furthering the aims of language curriculum. Content learning may be considered incidental, and neither teachers nor students are held accountable for content outcomes” (Met, 1999: 6).

Most of the great variety of CBI-related methods can be placed on the continuum defined by these two poles. Some can be defined merely by the extent of language and content integration, and the predominance of either language or content aims, however, others have developed a more specific methodology (as suggested also by a specific name under which they are recognised, e.g. CoBaLLT, CALLA, etc.). (For further discussion of the language-content continuum see also Jourdenais and Shaw, 2005, Stoller and Grabe, 1997, Stoller, 2004, Short, 1993, Crandall, 1994)

In the following section, three content-based learning models will be described – one from each pole of the continuum and one more balanced model. It is important to see the possible practical implementation of the characteristics discussed above in order to fully appreciate the problem with the assessment of the skills acquired (i.e. language as well as content knowledge).

The following three models, devised by Donna Brinton and her colleagues (1989), are perhaps the most often used demonstrations of the CBI models, and by now they

themselves have been established as commonly used terms in language teaching (so a course would be defined as a sheltered or theme-based, for example).

(1) *Sheltered Education* (content-driven model)

In these classes the students use second or foreign language to study content. The class is taught by a content instructor not a language instructor. However, the content instructor is aware of and prepared to respect the students' language proficiency level (he/she had received formal instruction) and to adapt the course to their language skills. This usually happens through making the instruction more accessible to students of different levels of English by means of adapting the language of texts, and using more explicit techniques in the classroom presentation frequently employed by language teachers (class presentation, video, visuals, graphic organisers, etc.) It is argued that "language acquisition occurs through content mastery; the focus is on content rather than on language" (Brinton, 2001: 2, cf. Met, 1999, Stoller and Grabe, 1997). Content however is never 'watered down' to accommodate for students language abilities.

(2) *Adjunct Education* (balanced model)

In this model, the language and content instruction are equally important and are realised through 'linked' classes – on content as well as on language. These classes are taught by both, the language and content instructors. Both, second language learners and English native speakers are enrolled in the content course. "The purpose of the content class is content mastery; in the language class, the purpose is for students to master elements of the second language which are necessary for success in the content area" (Brinton, 2001: 2). The two classes are closely coordinated and their content is negotiated between the two teachers. This model is rarely applied in Europe as it presupposes that the language of learning is also the language of the environment. However, a variation

adapted to the European conditions exists in which a particular subject is taught by two instructors in parallel in the students' first and second language.

(3) *Theme-based education* (language-driven model)

The course or programme is organised around a topic or a theme rather than structured according language learning aims (such as grammatical features). The main goal is the teaching of language (not content) and so the topics are chosen in order to capture the interest of the students – “the teacher presents topics as a vehicle for language development” (Brinton, 2001: 2). The goal of this model is to assist learners on developing general academic language skills through interesting and relevant content (cf. Brinton, 1989, Met, 1999, Short, 1993).

In the European setting, the two end-point models are prevalent. This results from the lack of available teacher training focused on both the mastery of content and language teaching aims and practices. Moreover, materials truly integrating language and content learning are still rare and little effort is invested into their development (Dalton-Puffer, 2002). Thus, if the integration of language and content learning is attempted it usually takes form of either a language course with a theme or merely a native-speaker of the second language is installed to teach a content course.

2.2.3 Evaluation and Assessment

The content and language integrated learning, despite its apparent effectiveness in language learning outcomes, also faces large difficulties that might hinder the successful implementation. One of the prominent issues is that of the evaluation of the learners. Although many theoreticians claim and warn that the testing must be conducted in a well-balanced manner with respect to the specific course and its ratio of language and content (cf. de Bot, 2000). In contrast to the process of learning in which language and content

serve as vehicles for one another, in evaluation, language and content can act as adversaries, when the knowledge (or lack of it) of one influences the measured outcomes of the other. As pointed by Met (1999), "it is possible that the students will know content relatively well, even if they cannot demonstrate the depth of their understanding through language." In finding a solution she suggests that "[t]eachers will need to decide when content learning should be assessed independently of language" (Met, 1999: 16, cf. also Genesee, 1994).

These claims reveal a rather elementary misconception of the way language learning and learning in a specific language works which then further leads to the assumption that language and content can be easily separated and also tested in this manner. However, as was proved in psycholinguistic research (cf. Spelke and Tsivkin, 2001, Dehaene et al., 1998, Dehaene et al., 1999), information learned in a certain language are likely to be encoded in the language of instruction with the memory and recall maintaining language-specific format; hence the two (i.e. language and content) cannot be readily divorced from one another. Thus, in order to ascertain how to test a selected component (language, content or both) effectively, extensive research into the mechanisms of language processing in connection with content learning is necessary. As already mentioned earlier (see section 1), the present state of research into these issues is by no means satisfactory. Debora Short in her article on Assessing Integrated Language and Content Instruction claims that "assessment is the weak link in the integrated language and content approach" (Short, 1993: 18). Further, Kees de Bot, a prominent CLIL theoretician, argues (speaking about language testers) that

the major part of their work on testing is built on the black box approach prevalent in the behaviorist era. While there now is quite some information on the various subprocesses of language production and language perception, most language testing is still geared towards the outcomes of the whole process.

As he further adds,

[I]nstruments have to be developed that are specifically aimed at assessing the working of various subprocesses. In production, things can go wrong in many stages of the process...Testing procedures are needed that will allow us to get specific information about problems in these substages of language production" (de Bot, 2000: 229).

Van de Craen remarks that "[w]hile CLIL or CLIL related methods seem to work it cannot be said why they work and which parameters should be studied in order to actually see linguistic and metalinguistic processes at work. In this respect, CLIL resembles acupuncture: it works but nobody seems to know why" (Van de Craen, 2001: 1). Evaluation is therefore one of the crucial issues which need to be addressed in depth, unless CLIL is to be launched on a large scale without a fuller understanding of its mechanisms.

Another issue that warrants further attention is the generalisation or knowledge transfer between two languages (not to be confused with the 'linguistic transfer' between languages). A successful integration of language and content depends on the assumption that an information learned in one language will be likewise effectively retrieved in the learner's other language. However, the exact functioning of the transfer of knowledge in CLIL requires further investigation so as to assess the suitability of a particular model (i.e. adjunct, theme-based, sheltered) for a particular learning condition. Also, such research is necessary in order to allow for tests which better reflect the dual-focused commitment to both language and content to be devised.

2.3 **Conclusion**

The discussion of the CBI and CLIL characteristics highlighted the innovative approaches that challenge the form-oriented learning and indeed succeed in capturing some aspects of 'natural', spontaneous language acquisition. According to Segalowitz & Lightbrown (1999: 52), "[i]t is widely acknowledged that CLT has the merit of avoiding many of the shortcomings of the repetition-based, decontextualised techniques characteristic of audiolingual teaching approaches." The benefits of CLIL are apparent namely in the newly placed emphasis on social and pragmatic aspect of language with the communicative competence replacing the more easily quantifiable aims of language learning. CLIL (with its philosophy of meaningful learning which is not isolated from the context of the learner's life) allows for a holistic development of the learner's personality in which the foreign language acts as an important medium.

However, while focusing only on the positive outcomes of CLIL, many of its shortcomings might pass unnoticed and be introduced into the practice of language education. The functioning of CLIL is still not sufficiently documented and the reports of its success are based mostly on the evidence from CBI immersion courses. The research that would map the outcomes of a distinctively CLIL setting is still lacking. In this respect, such sensitive issues as the possible language attrition and assessment of students in CLIL are still not sufficiently addressed and empirically supported. In order to obtain more conclusive evidence on these issues, it is necessary to research the cognitive and language abilities of the CLIL in detail. Without this, CLIL can be little more than an imperfect immersion programme attempted in European conditions.

3 Empirical Part

Learners differ considerably in how successful they are in learning language. This is true for both their first and second language learning (cf. Ellis, 2004, Horwitz, 1999, Tercanliogu, 2005). Generally, three types of factors are recognised to influence the learner's performance in the second language learning: (1) social, (2) cognitive and (3) affective factors. This thesis is concerned primarily with the last two factors as they are internal to the learner, i.e. "they lie inside the learner" (Ellis, 2004: 525). These variables will be studied in the context of the Content and Language Integrated Learning (CLIL) and the features that are characteristic for it.

The empirical part of the thesis consists of a psycholinguistic (experimental) and classroom study (survey) designed to bring the much needed evidence for the CLIL practice. The first empirical part (3.1) will comprise an experiment study designed to examine the general cognitive tendencies present in simultaneous learning of both the foreign language and the subject-matter. The outcomes of the study should help to bring a deeper understanding of mental processes underlying the Content and Language Integrated Learning. In particular, it will concentrate on the interaction of the language and content-knowledge which might play a significant role in the learner's performance. The second empirical part (3.2), the survey, will focus on the affective factor in learning, i.e. learners' experience of and attitude to CLIL, as these might influence both the learners' attainment as well as their satisfaction with the learning process.

Both studies are complementary: While the experimental part will attempt to bring evidence on how the processing and production of information might be affected by the CLIL setting (all things being equal), the survey will bring complementary data that will enable us to better understand the students' attitude to CLIL based on real experience. As the two dimensions, the cognitive and the affective, are strongly interconnected in everyday life, the study as a whole hopes to illuminate certain areas that warrant further attention of CLIL theoreticians as well as language professionals implementing CLIL in their institutions.

3.1 Experimental Study

Despite the overall optimism accompanying the implementation of CLIL as an official alternative to traditional language education, little is known about its effect on the cognitive processes in general. As the proponents of CLIL come mainly from among the language specialists, they naturally welcome the positive effects of CLIL on language learning. However, as in some of its versions, CLIL-instructed subjects are intended to fully replace the subjects instructed in the learners' native language, the effect on the content knowledge and performance in the subject knowledge should be also carefully examined; in particular, the interaction of language and content in storing and recalling information requires further research.

Thus in the following research, I would like to address some of the most pressing questions that arise from the CLIL practice, i.e. from the interaction of language and content learning. This study attempts, above all, to bring evidence about the interdependence of content and language in which the content is acquired. This language-dependent nature of the content knowledge will be examined in relation to the prior knowledge, the ability of the students to generalise between their two languages (i.e. to use information gained in one language with equal ease in their other language), and the ability to recall this knowledge in either of their two languages.

Learner differences can be studied in relation either to an individual or to a group of learners that share certain characteristics that distinguish them as a group (e.g. cultural factors, gender, participation in a special learning programme, etc.). In this study, CLIL is regarded as such factor, i.e. it divides the student population into two groups - the monolingually trained group (i.e. receiving the instruction and examinations solely in their native language) and the bilingually trained group (their first and their second language are both involved in their learning and school assessment). Although intersubjective differences in cognitive abilities are of importance, the present study seeks

to point to the differences found between the performance of the two groups rather than among individuals.

Although this study may not be able to provide answers as to the exact functioning of the two languages in relation to content knowledge, its outcomes may indicate certain important directions for research on CLIL assessment practice. Also, it may demonstrate the impact of certain variables on the students' attainment in CLIL (such as the impact of age, the extent of learning, proficiency level, etc.) which may provide important guidelines when deciding for a particular CLIL model (e.g. sheltered, adjunct or theme-based).

3.1.1 Previous research

In this section, I would like to discuss studies which form the rationale for the experiment and allow to formulate research questions for the present study. These studies come from three areas – (a) neurolinguistics and neuroimaging studies of language processing that search for evidence in the brain structures as the structural overlap of two observed areas (in this case language and numerical processing) suggests that they are related also functionally, i.e. they use the same strategies or are composed of the same neural processes, (b) psycholinguistics and the behavioural evidence, and (c) applied linguistics with behavioural as well as outcome-oriented research. All of these studies are complementary in nature of their research, and the evidence reported is of special importance when confirmed from more than one discipline.

The following three sets of findings will be presented in this section. First, the issues from bilingual processing that are relevant for the present study will be discussed. These will concern mainly the specialisation of the bilingual's (learner's) two language functions and the possibility of transfer of knowledge between the two languages. Second, the discussion will involve the monolingual and bilingual numerical processing. Although the main interest of this study lies with bilingual subjects, the bilingual numerical

processing is inevitably based on and related to the processing as observed in monolingual condition. Thus, in brief, monolingual number processing will be considered in order to find out the nature of this process as well as to find out in what way (if at all) this processing can be affected by language. These findings will be further used in the section discussing numerical processing characteristic for bilinguals.

3.1.1.1 *Issues in bilingual processing*

As was already argued earlier, bilinguals are rarely equally fluent in all their language skills (reading, writing, listening and speaking) in their two languages (for discussion see 1.4). Moreover, their linguistic competence in various subject areas also varies as they usually use the two languages for a different purpose, and attribute to them different social or emotional functions (i.e. they distinguish when, with whom and for what purpose or occasion they use a particular language) (cf. Grosjean, 1998, Fabbro, 1999). After all, as argued by Dudok (2002), linguistic competence which varies according to subject area or situation is quite common in monolingual speakers as well.

These arguments criticise the mistaken belief that one person, be it a bilingual or a monolingual speaker, can be expected to have mastered all domains of language equally well. They also imply that it might be a mistake to generalise from one's competence demonstrated in a particular area to the overall competence or to expect the same level of proficiency in other areas. This may be true especially of language learners before they reach a certain level of language stability. This view is supported by Barwell (2005) who, using the example of the language of mathematics, pointed to the level of learners' proficiency in conversational English, which, however, may be potentially misleading: "[W]hile learners of EAL may *appear* to have mastered English within less than two years, they can take several more years to achieve native-speaker proficiency in the use of mathematical English" (Barwell, 2005: 330). He further argues that the research has shown "that learners of EAL generally become conversationally proficient much more quickly

than they achieve proficiency in the use of academic English" (Barwell, 2005: 330, cf. also Cummings, 1991). Fredericka Stoller, arguing from the stance of language pedagogy, claims that "[c]urrent evidence indicates that the way language is used in particular academic domains, such as mathematics, is not the same way it is used in other academic domains, such as social studies." She concludes, "[k]nowing how to use language in one context does not necessarily mean knowing how to use it in another" (Stoller, 2004: 3).

Moreover, even if a person shows a certain level of balanced bilingualism, his/her two languages may not be equally activated in each situation. In this respect, Grosjean (1998) introduced the notion of 'language mode' defined as "a state of activation of the bilingual's languages and language processing mechanisms" (Grosjean, 1998: 136). This mode ranges on a continuum from totally monolingual (only one language is active) to totally bilingual (both languages are activated, usually demonstrated by code-switching and borrowing). The degree of activation of one language at a particular occasion (in testing conditions, in everyday life, etc.) may be influenced by factors such as the language of the environment, the language of instruction, the language of stimuli, the presence of other bilinguals, etc.

There is much evidence which demonstrates that bilinguals use their languages differently, due to either the level of activation of the particular languages or due to their competence in that language, etc. However, as a number of studies suggest, there exist also certain forms of interdependence between the bilingual's two languages. First of these concern the interdependence (or transfer) between linguistic skills in L1 and L2. Cummings (1991) quotes evidence from several studies (Ramirez, 1985, Gonzales, 1986, Linde and Lofgren, 1988, and others quoted in Cummings, 1991) which investigated the transfer of academic language skills. They found that although the academic language skills were trained (acquired) only in one of the students' languages, the other language appeared to have benefited from it as well, i.e. it showed an improvement (acquisition) of certain aspects of academic skills. Cummings maintains that the system of the two languages is not separate, "hence competence in one is partly a function of competence in the other" (Clarkson, 1992: 419, cf. also Cummings, 1991). In these studies, the

improvement in the other language could not be explained by a mere transfer of linguistic elements across the languages, as these were not closely related (e.g. Swedish-Finnish, Hebrew-English, etc).

Second, the studies provided evidence that knowledge of a particular content-area influenced the subjects' performance when processing the information from this content-area in their L2, i.e. the subjects who had previous experience with a certain subject-matter found it easier to process information (e.g. to read, listen, answer questions, etc.) from this area when these were presented in a foreign language. This finding was reported in a study on text comprehension in which Bernard Spolsky (1994) tested 317 students who were learning English as a second language. "The results established that both language proficiency and prior knowledge predicted the cloze score (measures reading ability)" (Spolsky, 1994: 145) confirming that when tested on general reading skills, the subjects with the prior knowledge of the subject area performed better. These findings were further supported by a research conducted on 30,000 students taking TESOL examinations (Hale et al., 1988, reported in Spolsky, 1994). The data collected in this study proved that there was a statistically significant difference in the students' performance in text comprehension depending on whether the text was from the field with which they were familiar or not. These studies provide further evidence for the interaction of a particular language and content which does not allow for independent testing of language and subject-matter.

Finally, the notion of the L1 and L2 interdependence was examined at the level of cognitive processing and development. The supportive evidence comes from both, applied linguistic and psycholinguistic studies (Bialystok, 1991, Geary et al., 1993, Cummings, 1991, Van de Craen, 2001). Here, it was claimed that students of two languages (bilinguals) showed a cognitive advantage following from the use of their two languages. These positive effects were reported in concept formation, classification, creativity, analogical reasoning, etc. (Diaz and Klingler, 1991). However, as claimed by Cummings, whatever the positive effects of bilingualism, they would become apparent only after a certain level of proficiency in both languages was reached (the so called

'threshold theory') (Cummings, 1991, Barwell, 2005). Other authors too support this notion (cf. Perani et.al, 1996, Geary et al.1993, Dickey, 2004) although they attribute it to different reasons (e.g. the extend of cognitive load, the proficiency, etc.)

From joint behavioural and pedagogical literature (cf. for example Grosjean, 1998, Stoller, 2004), it was argued, that certain domains in life are covered by one of the bilingual's languages only. Even in the situations, in which the bilingual might have an equal competence in both his/her languages, the bilingual mode, i.e. the activation or deactivation of one of the languages can influence his/her performance requiring language skills. Even so, in a learning situation, several authors (cf. for example, Cummings, 1991) suggested certain amount of linguistic interdependence in which the academic skills related to language were found to be transferred from one to the other bilingual's language. Yet, other studies pointed to a possible transfer between content and language (a previous content-knowledge advantage was found when testing text comprehension) (Spolsky, 1994). Finally, the link between language development and general cognitive development was described by a number of authors, arguing for the relationship between the improved cognitive skills and the second language learning (cf. for example Bialystok, 1991, Bialystok, 1997).

3.1.1.2 *Numerical processing*

In order to examine the nature and extent of the dependence of language and content (as represented by learning of exact facts) this effect will be discussed first in monolingual conditions and processing. Here, it was argued, certain arithmetic operations are language-dependent (e.g. the numerical facts are stored as vocabulary items, etc.). Consequently, it will be examined whether the same effect could be found in bilingual subjects (whether numerical processing is also language-specific i.e. whether the learning and retrieval of exact facts can be related to a particular language) and what the factors underlying it might be.

3.1.1.2.1 Monolingual numerical processing

Among the monolinguals, an extensive research has been conducted into the relationship of mathematics (arithmetic operations, information processing, fact retrieval, etc.) of which two sets of findings are reported here.

First, the neuroimaging studies revealed differences with different stages of numerical processing (i.e. identification of notation-format, or the calculation per se) as well as with difference in mathematical operation tasks (e.g. multiplication, addition, etc.) More importantly, a distinction has been also found with respect to approximate as opposite to exact quantity handling (Fulbright et al., 2003, Dehaene et al., 1998, Dehaene et al., 1999), especially when performed with Arabic digits as opposed to verbal numerals (Pinel et al., 2001). In particular, approximate calculations have been considered to be associated predominately with visuo-spatial processing, involving no dependence on language and relying on sense of numerical magnitudes (Dehaene et al., 1998). By contrast, exact calculations and numerical facts have been associated with networks involved in linguistic processing (Dehaene et al., 1999). Various studies postulated this distinction and confirmed the involvement of the language-related areas in the processes involving exact numerals (Le Clec'H et al., 2000, Dehaene et al., 1999, Pinel et al., 2001, Fulbright, et al., 2003, Hirsh et al., 2001).

Second, with respect to the structural overlap between the cortical areas activated in exact numerical processing and the areas traditionally associated with language (Broca's area in the frontal lobe), it has been suggested that the structural overlap might imply the functional overlap and thus the interrelation between the tasks. However, it has been proposed (Hirsh et al., 2001) that although some common brain regions may be involved, the area might be functionally diverse and thus the neural substrate that is used in language tasks might not be necessarily related to the substrates used in the mathematical operations. In other words, the tasks tested (language and mathematical tasks) might share some basic cognitive operations, or the same strategies, which activate the same areas. These shared processes could, for example, include the very fundamental

cognitive tasks of recognising the difference between one and more objects, object naming and same-different discrimination which provide the cognitive foundations for both language and mathematical tasks.

Studies with monolinguals brought evidence that calculations with exact numbers tend to be connected with language processing. The interdependence of language and mathematics was further supported by the theory that the language and numerical processing may consist of and employ the same basic cognitive processes or components.

3.1.1.2.2 Bilingual numerical processing

Bilingual numerical processing has been examined in order to assess the influence of a specific language on mathematical skills. The behavioural bilingual evidence appears consistent with the findings among monolinguals. Similarly to the monolingual studies, the role of language has been suggested in performing exact calculations or retrieving exact arithmetic facts. The studies with bilinguals have in addition highlighted the role of language in which the operations or facts were trained or the facts memorized (i.e. the language-specific effect).

Dehaene et al. (1999) provided evidence that in an addition task, bilinguals stored the arithmetic knowledge acquired during training with exact numbers in a language-specific format and showed a language-switching cost due to the required internal translation of arithmetic problems. On the contrary, approximate additions were performed in both languages with equal efficiency. This has been taken as evidence pointing to the ability to generalize approximate learned facts and store them in language-independent format as abstract magnitudes. In the exact tasks, the language of training was proved to be of crucial importance, and showed an interaction effect with the exact tasks, suggesting that each new fact was stored independently of neighbouring magnitudes, perhaps as a sequence of words.

These findings were largely confirmed in a study done by Spelke and Tsivkin (2001), in which the emphasis was placed on the learning and retrieval of exact as opposite to approximate facts. The authors argued for a language-dependent format of the exact facts, which was confirmed in the study. Moreover, a strong language-specific effect was found when the subjects learned exact arithmetic facts. Following their findings the authors suggest that “natural language may serve not only as a medium of input for learning but as a medium of representation for the learnt information.” (Spelke and Tsivkin, 2001: 79). This means, that counterintuitive as it may be, even knowledge of numerical facts (e.g. dates) is not stored in a universal, language-independent format.

This fact further implies that the transfer of content knowledge between a learner’s two languages may not be easy as the knowledge may not be readily accessed in both languages. Crucially, in language learning practice, this might also imply that “a child who is told that ‘two plus two equals four’ and that ‘deux et deux font quatre’ may need to learn two facts not one” (Spelke and Tsivkin, 2001: 79).

Nevertheless, this article does not address the problem of different sensory modalities for encoding of information – whether some of them tend to be more and other less language-dependent. However, distinctions should be made especially between the auditory mode in which the numbers are necessarily language specific and the visual digit processing which might resemble picture naming, and may be stored more language-independently.

The findings of the two studies described above (Dehaene et al., 1999, Spelke and Tsivkin, 2001) are in accordance with an earlier study done by Frenck-Mestre and Vaid (1993) in which the storage and retrieval of arithmetic knowledge in bilinguals were examined. The authors argued for a strong first language preference in arithmetic calculations, while stressing the underlying fact that this is usually the language in which the information is learned. In the discussion, they also pointed to the first language advantage in bilingual numerical processing when confronted with two languages simultaneously. However, they also highlighted other factors possibly influencing the preferred language of computation, such as prosodic features (length of syllables) and the

working memory. Also, they noted that in very automatic calculations, especially the ones that are usually trained in order to become automatic, instead of a mathematical operation we may be observing a mere retrieval from memory table (cf. also Cohen et al., 2000).

The authors further argued that the strength of the first language advantage is affected by the bilingual proficiency in their second language. The more proficient bilinguals showed therefore smaller difference in performance between languages. They, however, rejected the hypothesis that the slower response times in second language performance can be explained by inner translation, as the error rate in the answers increased as well. In their study, the format of presentation (digits versus number words) was found to play a significant role in solving arithmetic tasks.

Finally, an especially significant observation was made by Spelke and Tsivkin (2001) concerning the relationship between the language of training and the consequent retrieval of information. The differences between the approximate and exact facts retrieval has already been discussed (see 3.1.1.2.1). The study, however, also suggested a much broader and more intricate explanation of the system underlying the language-specific storage of exact information. "Preliminary findings suggest that subjects formed language-specific representation of time and space as well as number, consistent with suggestion that uniquely human spatial and temporal concepts are language dependent" (Spelke and Tsivkin, 2001: 79). These findings indicate that the learning of new facts might also partially depend on the existing network of facts already encoded in the language-specific format. Following this finding, it also should be examined, whether any interference can be found when a piece of information has already been learned in the first language and is now to be re-learned – encoded - into the second language. This evidence could be interpreted in the context of the study conducted by Hirsh et al. (2001), described earlier, in which the authors claim that language and numerical processing might share the same cognitive components (e.g. the same-different discrimination, object naming and magnitude discrimination). Perhaps, it could be argued that in a similar manner, the wider spatial and temporal concepts could share the cognitive components of the simpler processes, such as numerical and language processing, and in this way be interconnected.

In these studies, an intricate relationship of memory, language of training and proficiency in the two languages has been suggested. The studies especially tried to explore the effect of the language of training on the bilinguals' performance; however, although a certain body of evidence in support of the language-of-training advantage over the first language exists, this issue remains unresolved. The main problem lies in the fact, that in the majority of the studies the language of mathematical education was inevitably the subjects' first language and so the contrast in performance between the first language and the language of training (which is the subject's L2) could not be well documented.

An interesting observation of Spelke and Tsivkin (2001) pointed to possibly broader implications of the language-specific information processing (i.e. storing and retrieval). The authors stressed that the learned information cannot be disassociated from the particular language in which it was learned. Thus, in an educational setting, learners might show advantage from working in language in which the prior training was received (and the content knowledge acquired). Frenck-Mestre and Vaid (1993) likewise pointed to the language-specific aspect of exact facts learning. They stress the similar nature of language learning and information learning. The information are likely to be stored as words and as such are influenced by linguistic features such as rhythm, number of syllables, etc. commonly observed to play a role in vocabulary learning.

3.1.2 Outline of the experiment²

A group of Slovak students learning English at a secondary school with enhanced learning of foreign languages (the so-called 'bilingual secondary school') were selected to participate in the experiment that would allow to investigate the impact of language of

² The design of the experiment is a partial re-duplication of the experiment described in Spelke and Tsivkin, 2001.

training on test performance. They were given a set of arithmetic problems involving large exact addition (adding 56 or 64 to a set of two-digit numbers) that were new to them. The students were randomly assigned into two groups – one group learned these operations in Slovak (their first language) while the other group was trained in English (their second language). Each of the two days of training, the subjects were tested on all problems in both languages. The speed of their responses was compared in the trained and untrained languages. The general question was whether the students in the two groups would show significant differences when tested on the knowledge of the learned facts. In particular, the aim of the experiment was to observe whether the students with this level of proficiency and amount of training would show the language-of-training advantage in both their first and their second language, or whether they would perform better in the language in which they learned and habitually perform arithmetic (i.e. Slovak).

In addition, the aim of the experiment was to investigate whether there is a difference between the ability to generalise from the trained to the untrained (novel) problems in relation to the language of input (training) and the language of performance. During the test session, subjects were also presented with some items which in range resembled the trained problems (exact large addition) but were not among the problems trained. Performance on these untrained problems was compared with the performance on the trained problems. The difference was analysed in particular in relation to the language of training and the language of test in order to see whether monolingual (Slovak-Slovak, English-English) testing condition³ was more beneficial to generalisation of knowledge than the bilingual one (Slovak-English, English-Slovak) or whether the

³ Testing condition refers to the condition created by the combination of the language of training and the language of test. In the experiment, there are four testing conditions: Slovak-Slovak, Slovak-English, English-English, English-Slovak. The notation used in reporting on the testing conditions has the following form: Language of training-Language of test.

presence of their first language (Slovak) as either language of input or language of output should be of special benefit to the subjects.

3.1.2.1 *Hypothesis forming*

Drawing on the findings from the previous studies, it is expected that three factors (variables) and their interaction will be of special importance in deciding the performance of the subjects:

- a) The first language advantage: It is supposed that the subjects operating in their dominant language (Slovak) will show a first-language advantage. This should be most evident in the Slovak-Slovak testing condition, but also the subjects in the English-Slovak testing condition could benefit from being tested on the L1 material.
- b) Language of prior mathematical training: As all of the subjects share the same level of mathematics, the observed variable at play will be the language in which their mathematical knowledge has been encoded so far (Slovak). As argued above (3.1.1.1), mathematics may represent a special subject-area that might not be linguistically covered by the students' (bilinguals') L2 language competence although their level of L2 (English might be otherwise high) in the everyday use of the language as well as in several special areas other than arithmetic. Also, the interaction of memory and language might be expected, in the sense that the retrieving of facts and further learning of facts might be strongly connected to the language in which similar facts or these facts were learned earlier (cf. Spelke and Tsivkin, 2001, Frenck-Mestre and Vaid, 1993).
- c) Language of training: Here, it is expected, that subjects trained in one language should show an advantage when tested in the familiar language (cf. Spelke and Tsivkin, 2001, Frenck-Mestre and Vaid, 1993).

In the following table, the above-discussed factors are presented for each testing condition:

Table 1 Factors influencing the subjects' performance

Groups	Language of training-language of test	L1 advantage	Language of prior Math. Training advantage	Training advantage
Group 1	Slovak-Slovak	Yes	Yes	Yes
	Slovak-English	Yes	No	No
Group 2	English-English	No	No	Yes
	English-Slovak	No	Yes	No

As is apparent from Table 1, it might be expected that the subjects in the Slovak-Slovak testing condition might benefit most from the accumulation of advantages i.e. L1 advantage, language of prior mathematical training advantage and the language of training advantage. Thus it can be predicted that they should exceed the performance of the subjects in the remaining three testing conditions. Given the same number of advantages of the subjects in the remaining three testing conditions, and the yet unclear interaction of these factors, it remains an open question which of these will have the largest impact on the subject's performance.

3.1.2.2 *Participants*

The participants were eleven female and five male speakers of Slovak and English, their age ranging from 16 to 20 years (mean age 18.0). All of them were secondary students attending Evanjelické Gymnázium in Tisovec (Slovakia), a 'bilingual secondary school', which offers certain forms of content and language integrated instruction. The first year of the education is devoted to a great foreign language input so as to enable teaching of selected subjects in foreign language in the following years, with the number of English-instructed subjects increasing each year.

The students were selected following the criteria: the age, the level of English proficiency and the overall school attainment. The last two factors were ascertained following the consultation with the teachers of English as well as the teachers of other

subjects. The selected students were all native speakers of Slovak who received either none or very limited instruction in English before adolescence. Although some of the participants reported having started with English in an earlier age (i.e. at the age of 5) it was established that none of these students took part in any form of immersion education which could result in language processing different from the other participants.

The participants' level of English proficiency was established as intermediate or upper-intermediate in all four language skills on the basis of their school grades and interviews with their language teachers, who commented both on their class and outside-class performance. This level was further confirmed by the researcher in an informal interview. The level of the participants' skills in mathematics was assessed as complying with the secondary school standards as all of the participants had to pass an entrance exam in mathematics.

3.1.2.3 *Apparatus*

The experiment was conducted on a HP notebook. A software program for linguistic experiments SuperLab 4.0 was used (see Appendix B, Figure 1B) for presenting the stimuli and recording the reaction times of the participants for each of the problems appearing on the notebook screen. The displays in the two languages were designed to be as similar as possible in size and layout. For both, English and Slovak presentation of the problems, the stimuli appeared in black colour on yellow background, in sans-serif font (see Appendix B, Figure 2B).

3.1.2.4 *Stimuli*

Training. In the training session, the stimuli consisted of 2 sets of arithmetic problems, with one problem and two candidate answers appearing on the screen at each trial. All of

the problems or answers were written out as numerical words rather than as digits. The two categories of problems were as follows:

- a) exact large number addition with addend 56: subjects had to add 56 to each of 12 numbers ranging in value from 46 to 94.
- b) exact large number addition with addend 64: subjects had to add 56 to each of 12 numbers ranging in value from 43 to 86.

The two sets were used for two reasons. First, to control for possible specific effects caused by a particular number and second, to enlarge the sample of material while avoiding too much repetition that would allow the subjects to solve the problems from memory. This design would compel the subjects to calculate the problems at least partly anew.

The two candidate answers were the correct sum and a distractor in which the tens place differed from the correct answer by 1, with the differences balanced in the underestimation and overestimation directions.⁴

Test. In the test session, the stimuli consisted of three types of arithmetic problems:

- a) trained problems: all of these problems were trained, as described above, to calculate the problems with one fixed addend (56 or 64) and one addend from a fixed set of numbers (46 to 94 and 43 to 86 respectively).
- b) semi-trained problems: these problems shared the fixed addend (56 or 64) with the trained problems, with the second addend being one of the fixed set of numbers (46 to 94 and 43 to 86 respectively).

⁴ This method was used following the reasoning offered in Spelke and Tsivkin, 2001: "We chose these foils to ensure that subjects would perform the full two-digit addition; foils with an incorrect digit in the units place could have been detected after only the first step in the addition" (Spelke and Tsivkin, 2001: 50).

c) untrained problems: both addends were taken from the fixed set of numbers (43 to 94), however, the particular combination was not previously trained.

In both, training and test sessions, the two candidate answers appeared on the left and right side at the bottom of the screen (see Appendix B, Figure 2B). Subject were instructed to select the correct answer by pressing the key 'A' or 'L' according to what side the correct answer appeared on (left or right). The problem and two answers remained on the screen until the subject selected an answer and pressed one of the keys. After this, a feedback display appeared announcing whether the answer was correct or incorrect. If the participant exceeded the limit set for giving an answer (20 seconds) a feedback display appeared informing him/her that the trial has run out (see Appendix B, Figure 3B). Immediately after, the next trial was presented on the screen. (Both Slovak and English training and tests respectively consisted of the same sets of problems, i.e. the English training and test were the exact translation of the Slovak version of the training and the test.)

3.1.2.5 *Design*

The students were divided into two groups – the first group received Slovak training (Group 1) while the second group received English training (Group 2). The students participated in 2 training sessions (taking place on 2 consequent days) in this language (Slovak or English). Each training session was followed by a test session in which the subjects were given 2 tests, one in each of their languages. Their results in four testing conditions were then compared (see Table 2).

Table 2 Experiment design

Group	Language of Training	Language of Testing	Observed testing condition
Group 1	Slovak	English, Slovak	S-S: Slovak training – Slovak test S-E: Slovak training – English test
Group 2	English	English, Slovak	E-E: English training- English test E-S: English training – Slovak test

Training. The training session consisted of a total of 120 trials (problems): sixty trials with 56 and sixty trials with 64. The problems were presented in blocks of 12 with each block repeated five times for 56 and five times for 64. In other words, the participants saw each particular problem five times during the session. The training session was divided by two breaks.

Test. Each test session consisted of two tests, one in Slovak and one in English. In both tests the same problems were tested. Each test consisted of a total of 72 trials: 48 trained, 12 semi-trained and 12 untrained problems (the ratio: 6:1:1). In other words, the participant saw each particular trained problems twice, and each semi-trained or untrained problem once during the session. Each test was divided by one break. Within the test session, the two tests were separated by a break and a conversation in the language of the following test.

In both, training and test sessions, the correct answer appeared for half of the cases on the left and for half of the cases on the right side of the screen. Also, for half of the cases, the correct answer from one set of trained problems appeared as incorrect in the second set of the trained problems as to force the participants to calculate the problem instead of memorising some of the answers as correct.

3.1.2.6 Procedure

The participants were tested individually in two one-hour sessions, held on two consequent days. The research was carried out in a quiet room located either in the school

building or in the researcher's home. The participants began by completing a personal data questionnaire that assessed their age and the age of language acquisition.

All training and test sessions were preceded by a casual conversation, and the researcher also offered a short explanation of the nature of the experiment. An effort was made to accustom the participants to the language of the following training or test and a short informal conversation was held with each participant before the training or test in the particular language. Further, each training and test session were preceded by an introductory session allowing the participants to accustom or re-acustom to the language of the session. This introduction consisted of a series of 5 slides appearing on the notebook screen with large numbers written as number words. These numbers were taken from the range of values that appeared in the problems and the answers so as to allow the participants to get accustomed to seeing large numbers written out as words.

Both training and test sessions were preceded by a detailed description of the procedure of the experiment (number of problems, their nature, i.e. exact large addition with 56 or 64, etc.). A handout with an outline of the procedure was shown to the participant so as to remove part of the anxiety which might arise from the unknown situation. Throughout the training and test sessions the subject began the experiment by pressing the indicated key. Once the experiment started, the participant followed the instructions appearing on the screen. The procedure was interrupted only during the break time, which did not have a set time limit. The first training session lasted for about one hour, the second training session was shorter, often between 40 to 45 minutes. The first test session lasted about 45 minutes, the second test session was shorter, it lasted about 30 to 40 minutes.

Between the first and the second test (in the different language) a sufficient time was given to the participant for relaxation and re-acustoming to the language of the following test. The participants were encouraged to pay equal attention to both the speed and the accuracy of the answer.

3.1.2.7 *Data treatment*

The quantitative data were analysed using descriptive and parametric statistics. The following statistical procedures were used to calculate the results:

(a) Mean, median and standard deviation. Mean is a measure of central tendency calculated as an arithmetical average of all scores. Median is also a measure of central tendency that divides an ordered set of numbers in half, i.e. it is the midpoint or centre of the ordered scores. As mean is very prone to be influenced by outliers (extreme scores) it can offer a poor representative of a "typical" score. In these cases, median is preferred in order to obtain a more realistic score. Standard deviation is a measure of variation in scores,

(b) A repeated measures ANOVA which allows to calculate the within-subject difference⁵ and between-subject difference⁶ while taking into account the fact that the results on various tests come from the same group of subjects. This allows for a more sensitive measurement reducing the influence of intersubjective differences

(c) A T-test for difference between two means that allows to measure the probability of the fact that the difference between two groups is not due to chance.

The product of these tests (ANOVA and T-test) is the measure of statistical significance of the data, reported as 'p'. 'P' reports the level of likelihood that an event will occur. Traditionally, the result is considered statistically significant (i.e. not due to chance) when the 'p' is reported at .05 level. The $p < .01$ then signifies a very strong statistical significance of the result.

The subjects were assessed on the latency data (speed of the subject's response) that were recorded for each problem presented in both training and test sessions. In this thesis only the results (latency data) from the two test sessions (from Day 1 and Day 2) will be evaluated and analysed with a detailed analysis performed only on the data collected on

⁵ The within-subject difference measures the variance of the subjects' performance across the whole sample.

⁶ The between-subject difference measures the variance in the performance between the compared groups.

Day 2 of the experiment as the subjects' reactions on the second day of experiment can be considered as more stable.

Only the responses in which subjects gave a correct answer were analysed: The data were checked for erroneous trials. Although the erroneous reactions comprised nearly 10% of all trials, the results are similar with or without the erroneous trials, therefore these trials were excluded from the analysed responses. The erroneous trials were further examined and the error rates were calculated for each day (Day 1, Day 2) and for each subject.

In addition, the results were checked for reactions that exceeded 11 seconds i.e. approximately three times the value of the overall mean reaction time (3,48 s). The reactions above this time limit were therefore considered as outliers – caused by fatigue, momentary loss of attention, etc. As these comprised less than 1% of all reaction times in the Day 1 and Day 2 test sessions, and the data is similar with or without them, these were left in the data and were not further analysed.

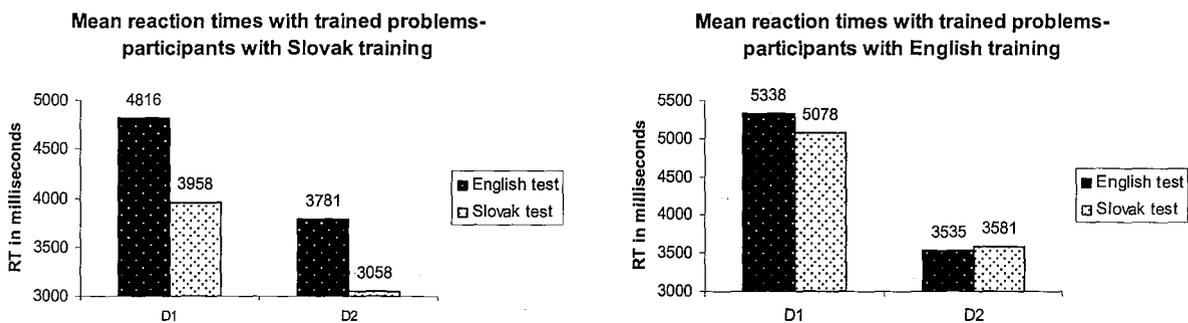
In the analysis, the mean response latencies were calculated for each subject, task (addition with 56, addition with 64), test session (Day 1, Day 2), language of training and problem type (trained, semi-trained, untrained). As the mean response latencies for the two sets of tasks representing exact addition (addition with 56 and addition with 64) were similar these were further reported together as 'trained' problems, i.e. the mean reaction time for trained problems was calculated for the two sets of tasks together.

3.1.3 Results

3.1.3.1 Effects of training

Figure 1 presents the mean reaction times for trained problems, for each test and for each day of the experiment.

Figure 1 Mean reaction times for trained problems



D1 – Day 1 of the experiment, D2 – Day 2 of the experiment

The figure shows that the latency declined from Day 1 to Day 2 in both test for both groups. These effects were confirmed by a T-test for difference between two means which revealed the main effect of the day of testing for the trained problems on each test ($t^1=6.296, p<.000, t^2=26.434, p<.000$). The figure demonstrates that the subjects showed the benefit of training in both the trained as well the untrained language.

The following table presents the means and standard deviations (SD) according to the day of experiment, language of training (English or Slovak) and the language of the test (English or Slovak).

Table 3 Means and standard deviation according to the day of experiment

		Day 1		Day 2	
		English test	Slovak test	English test	Slovak test
English training	Mean	5338 ^a	5078	3535	3581
	SD	1021	971	452	372
Slovak training	Mean	4816	3958	3781	3058
	SD	1018	467	605	250

^aThe data are reported in milliseconds.

The standard deviations for Day 1 indicate that the subjects showed greater interpersonal variation in responses in the reaction to the English test than to the Slovak test. This interpersonal variation, however, had a declining tendency. The standard deviations for Day 2 for all testing conditions suggest a more balanced reactions from the subjects. These results demonstrate that while on Day 1 some subjects reacted much faster than others, on Day 2 the differences between individual subjects were minimal.

3.1.3.2 Errors

Erroneous trials were analysed for each subject and for each day. The total number of trials in each test session was 2304 for all subjects. Table 2 summarises the error rates of all participants per one day.

Table 2

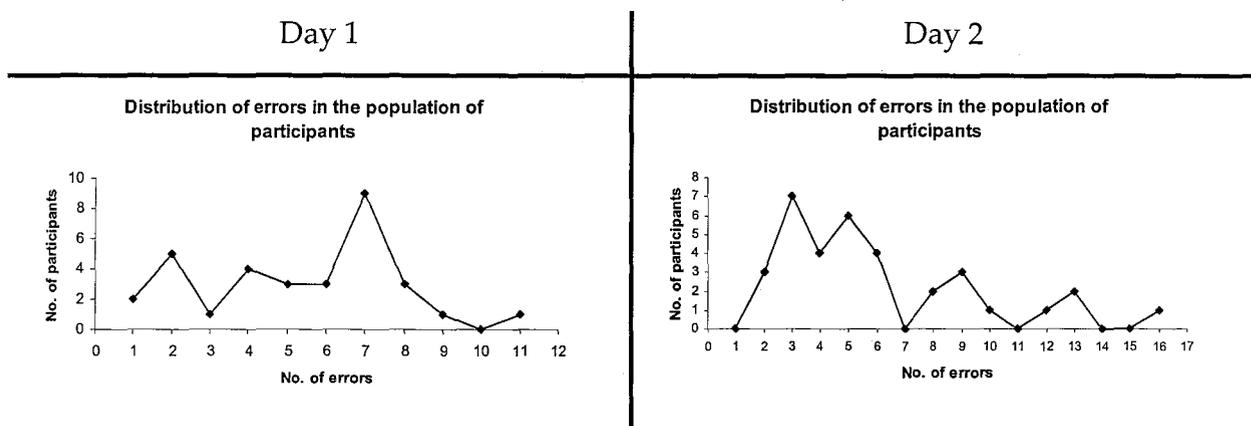
	No of Errors	Percent of errors	Mean error rate per one participant	Median error rate
Day 1	160	6.9 %	10	3.5
Day 2	197	8.8 %	12.5	5.5
Total	357	7.7 %		

As one of the expected effects of learning, it was predicted that the number of errors would decrease from Day 1 to Day 2. It was surprising to discover a contrary tendency with the number of errors increasing from Day 1 to Day 2 (Table 2). A further

analysis into the distribution of the errors among the participants was conducted. Both mean and median were calculated to account for the possible presence of outliers when high score of few individuals can skew the whole result.

Although the average number of errors per subject was 10 on Day 1 and 12.5 on Day 2, median calculated for the errors for the Day 1 showed the value of 3.5 and 5.5 for Day 2. This appears as a more realistic representation of the distribution as apparent also from the following figures (see Figure 2) which report the distribution of errors among the participants.

Figure 2 The distribution of errors among the participants

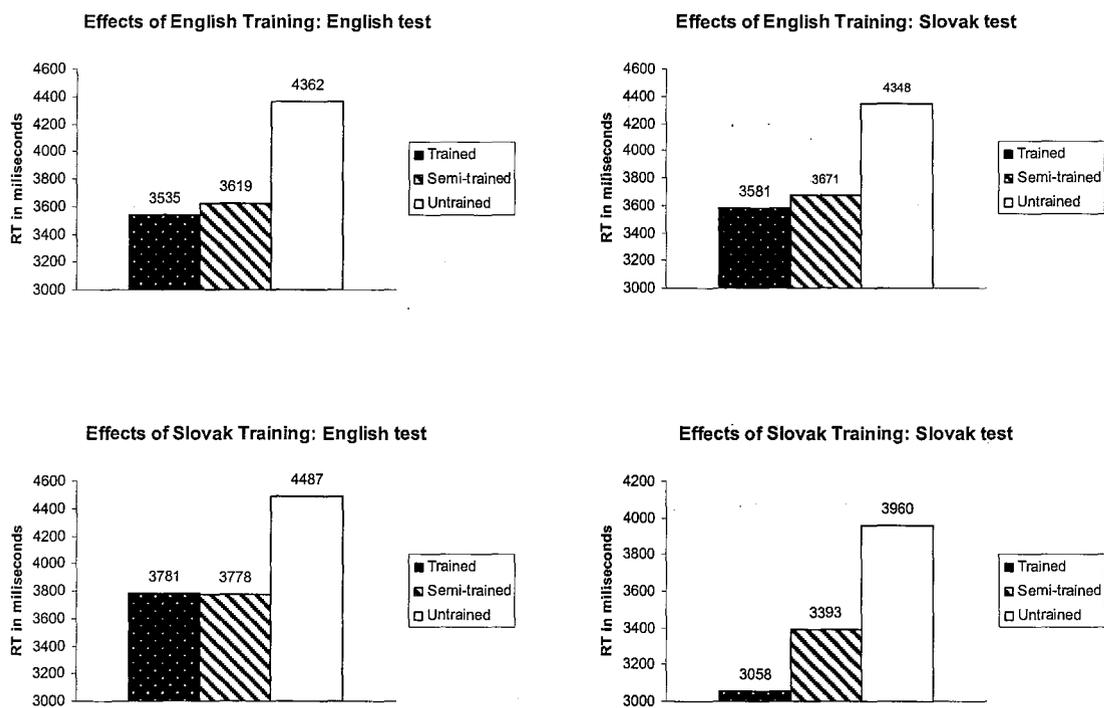


The figure shows that although the general rate of errors for the majority of the participants appears to have decreased from Day 1 to Day 2 as expected, the error rates for few individuals increased considerably. Although these findings provide an explanation for the seemingly general increase in the error rate of the subjects, they also reveal a surprising rapid increase in certain individual cases. This could be attributed to individual factors such as fatigue, loss of motivation or momentary loss of concentration, etc. Further analysis would be necessary to confirm or reject these explanations. Also, an analysis of the ratio of error responses to trained as opposite to untrained problems could reveal further tendencies in the subjects' reactions. (This, however, will not be attempted here as the limited number of participants prevents further meaningful differentiation.)

3.1.3.3 Effects of the language of training on the performance

Figure 3 presents the mean reaction times for each type of problem in each testing condition for Day 2 of the experiment.

Figure 3 Mean reaction times: trained, semi-trained and untrained problems



The figure shows the general trend in the effects of the language of training on the test performance as seen on different types of problems (trained, semi-trained and untrained). The data reveal the tendency of the subjects to perform faster on trained problems than on the untrained problems in both languages. The subjects also showed a slight advantage in performing on trained over semi-trained problems. The performance on the untrained problems was significantly slower regardless of whether the test was in the trained or the untrained language. The difference between the trained and untrained problems confirms the advantage of training already discussed (see section 3.1.3.1). On the

whole, the subjects in the monolingual testing condition (Slovak training-Slovak test) showed the greatest benefit of training documented by the fastest reaction times. The differences observed between the three remaining groups were not so robust.

These effects were confirmed by a statistical analysis. A repeated measures ANOVA was conducted to assess whether there were differences in how subjects trained in Slovak and subjects trained in English reacted to the test (and problem types) in their trained and untrained language.

a) Trained exact addition

A repeated measures ANOVA was calculated to assess whether there were differences in the subjects' reactions based on the language of their training in combination with the language of the test. ANOVA revealed the main significant effect of the language of the test ($F(1,14)=14.107, p < .002$) but not of the language of training ($F(1,14)=0.497, p < .492$). However, the main effect of the language of test was qualified by a significant interaction between the language of training and the language of test ($F(1,14)=18.227, p < .001$). This indicates that even though as a general rule, subjects trained in Slovak do not react differently than subjects trained in English, subjects trained in Slovak do perform on particular tests differently than subjects trained in English. The results reflect the tendency of subjects to respond faster in the trained language (especially in the Slovak-Slovak testing condition). In the untrained languages, subjects showed tendency to react slower, (especially in the Slovak-English testing condition).

The significant interaction of the language of training and the language of test involving the exact trained addition problems can be observed in the mean reaction times in the four testing conditions: Slovak training-Slovak test, English training-English test, English training-Slovak test and Slovak training-English test. From among these, the subjects in the monolingual testing condition Slovak-Slovak appear to react fastest and significantly differ from the other three groups (all $p < .05$). The subjects in three remaining testing conditions (English-English, Slovak-English, English-Slovak) are slower and do not significantly differ from each other on trained problems. However, from

among these, the subjects in the English-English testing condition show slightly greater benefit from the training than the subjects in the English-Slovak testing condition and the subjects in the Slovak-English testing condition who had the slowest mean reaction time.

b) Semi-trained exact addition

A repeated measures ANOVA was conducted to assess the effect of the language of training on the language of the test as observed on semi-trained problems. Both the effect of the test ($F(1, 14) = 1.986, p < 0.181$) and the language-of-training effect ($F(1, 14) = 0.108, p < .748$) were not found significant. However, the interaction of the language of training and the language of test ($F(1, 14) = 3.402, p < 0.08$) was found significant at 0.08 level. This indicates, similarly to the trained exact addition problems (although with less force) than when tested on semi-trained problems the subjects trained in Slovak do perform slightly differently than the subjects trained in English. Again, the benefit from both training and testing in Slovak only (Slovak-Slovak testing condition) was slightly greater than when the subjects trained in Slovak were tested in English, or when the subjects trained in English were tested either in English or Slovak.

c) Untrained exact addition

A repeated measures ANOVA was calculated for the effect of the language of training on the untrained problems tested in both familiar (trained) and unfamiliar (untrained) language. The main effect of the language of the test was found significant ($F(1, 14) = 4.458, p < 0.05$). The interaction of the language of training and the language of the test ($F(1, 14) = 4.001, p < 0.06$) was found less significant. The effect of the language of training on the performance of the subjects was not significant ($F(1, 14) = 0.14, p < 0.71$). These results indicate, that, again, the subjects did not differ in performance according to the language of training, with the exception of the language of training being paired with language of a particular test. The mean reaction times point to the general tendency of the subjects in the Slovak-Slovak testing condition to react faster on the untrained problems than the three remaining groups are likely to do.

3.1.3.4 Generalisation of trained to novel (semi-trained and untrained) problems

a) Trained and semi-trained problems

A repeated measures ANOVA was calculated to assess whether the reaction times for trained problems differed from the semi-trained problems for English test and Slovak test separately. The first test (performed on the results in English) did not show significant effect either of the problem type or of the language of training. The second test (on the results of the test in Slovak), however, revealed significant main effect of the problem type (trained vs. untrained) ($F(1,14) = 5.490, p < .003$) as well as the main effect of the language of training ($F(1,14) = 5.988, p < .002$). No significant interaction was found between the language of training and language of the test.

Further analysis was performed on the difference between the means in each of the four testing conditions. A paired-samples T-test and an independent-samples T-test for the difference of means were calculated within each testing condition for the difference between the mean reaction times of trained and semi-trained problems. The results are summarised in Table 4.

Table 4 T-test: trained and semi-trained problems

Testing condition	T-test	Trained vs. Semi-trained effect
Slovak-Slovak	2.305	$P < .05$
English-English	0.54	$P < .605$
Slovak-English	0.021	$P < .984$
English-Slovak	0.826	$P < .436$

As is apparent, only the results of the subjects in the Slovak-Slovak testing condition showed significantly faster reaction to trained than to semi-trained problems. In the remaining testing conditions, the tests did not reveal any significant difference between the trained and semi-trained problem types, i.e. the subjects solved the trained and semi-trained problems with about equal speed. This might point to a mechanism of calculating the problems in the test that distinguishes the behaviour of the Slovak-trained

Slovak-tested subjects from that of the subjects in other three testing conditions. The subjects in the English-English, English-Slovak and Slovak-English testing conditions appear to have generalised their skills and knowledge from their trained to the semi-trained problems and with the similar reaction times pointing to a similar calculating strategy used in both cases (likely to include some memorising and some new calculation). The performance of the subjects in Slovak-Slovak testing condition suggests that while the semi-trained problems required new calculation (as they were not viewed before), the speed of the reactions to the trained problems suggests a greater role of memory. However, this interpretation would require further experimental evidence.

b) Trained and untrained problems

A repeated measures ANOVA was calculated to assess whether the mean reaction times of the two groups for trained problems differed from the untrained problems for English and Slovak tests. Both tests showed significant main effect of the problem type (trained vs. untrained) ($F(1,14)=32.255, p<.000$ and $F(1,14)=24.780, p<.000$). The interaction between the problem type and the language of the test was not significant. The effects of language of training were not significant for the first group (English test), however, were almost significant at the $p<.05$ for the second group (Slovak test) with $F(1,14)=3.493, p<.08$.

Further analysis was performed between the mean reaction times of the participants within one testing condition. A paired-samples T-test and independent samples T-test for the difference of means were calculated within each testing condition for the difference between the mean reaction times of trained and untrained problems. The results of the tests are presented in Table 5.

Table 5 T-test: trained and untrained problems

Testing condition	T-test	Trained vs. Untrained effect
Slovak-Slovak	3.281	$P < 0.01$
English-English	6.712	$P < 0.000$
Slovak-English	2.941	$P < 0.02$
English-Slovak	3.999	$P < 0.005$

The table shows that all differences between the means of trained and untrained problems were significant. This indicates that the training was not generalised to the untrained problems. The difference between the performance on the trained and untrained problems further confirms that the learning took place in both training groups. The different latency could not be attributed to a surprise from encountering of an unfamiliar item in the test as by Day 2 all subject were aware of the test design that involved the unfamiliar items.

3.1.4 Discussion of the results

In this part, the results reported in the previous section (see section 3.1.3) will be discussed and interpreted in the light of the prior studies. While this part will offer a discussion of possible underlying causes, the general discussion will discuss the implications of the outcomes of the study for the language teaching/learning practice.

3.1.4.1 Effects of training

The learning took place in all cases on trained problems, as all subjects' mean reaction times improved between Day 1 and Day 2 of the experiment. The rate of learning (improvement) was comparable for both English-trained and Slovak-trained groups. This raises the question, whether the slower reactions of the English-trained group on the second testing day could not be accounted for by the initial disadvantage, i.e. the slower reaction on the Day 1 when the subjects had to adjust to a greater cognitive load caused by both new arithmetic problems and a new language of arithmetic operations. This also raises the issue of whether, if given additional training, the English-trained subjects' performance would further continue to improve and would eventually reach the level of the subjects learning and performing in their first language (Slovak).

Although some of the subjects reacted considerably faster than other subjects within their group at the beginning of training and testing (Day 1), these interpersonal differences decreased on Day 2 indicating that their knowledge and reactions have somewhat stabilised (see Table 3). These outcomes indicate that students might initially react very differently when required to perform in a foreign language but further practice may help to overcome these differences. As a result, their ultimate attainment (and cognitive processing) need not suffer due to the individual differences in adjusting to a novel situation.

3.1.4.2 *Effects of the language of training on the performance*

At this point the results that show the effects of the language of training on the subjects' test performance will be considered. On the whole, the subjects in the Slovak-Slovak testing condition reacted significantly faster than subjects in the remaining three conditions. When the reaction times for these three testing conditions were compared, no significant differences were found.

Slovak training

a) *Slovak test* – As expected, the response times recorded in the Slovak-Slovak testing condition showed the fastest reactions on all types of problems. This testing condition allowed the subjects to benefit from L1 advantage during both training and testing, as well as to draw on their prior knowledge of mathematics acquired in this language.

b) *English test* – When tested in English, however, their results differed significantly from those achieved in the Slovak test, i.e. their responses were considerably slower and greater interpersonal differences were found on both Day 1 and Day 2 of the experiment (Table 3). It appears, that many of the factors that served as an advantage when tested in their L1(Slovak) might have acted against their achievement in the English test. During the

training and a large part of the testing process the subjects remained in a prevalently monolingual mode (i.e. only their L1 was activated) which also enhanced their coding of new information into this language. Thus, when required to calculate in English the Slovak-trained subjects were not ready to activate their mathematical knowledge in the English language. In a sense, these subjects experienced a situation involving a heightened cognitive load similar to that experienced by the English-trained group at the beginning of their training.

English training

a) *English test* – It is an encouraging finding for the CLIL proponents that the English-trained group appeared to benefit from the training despite the fact that they were used to perform the arithmetic operations in their first language (Slovak). The data show that the subjects adjusted quickly to the task. Some of the subjects even achieved the level of the Slovak-trained Slovak-tested subjects (see Appendix C). It remains unclear, whether subjective factors such as difference in language aptitude, mathematical strategies, etc. could account for the observed difference in performance in the English-English testing condition or whether the faster times could be achieved by each of the subjects after a longer practice.

b) *Slovak test* – The finding that the mean reaction times collected for this testing condition did not differ significantly from the results in the English test deserves further attention. It appears that the English-trained subjects did not show advantage from either taking their test in their trained or their untrained language (which was their first language). Some interpretation for the overall slower reaction times in the English-trained group have been already suggested: interpersonal differences, the additional practice needed to overcome the heightened cognitive load, the unfamiliarity with performing the arithmetic operations in their L2. Although these provide plausible explanations, this finding should be above all interpreted in relation to the large difference found in the Slovak-trained group when performing in their first and second language (see below).

On the whole, the data from the two groups did not prove the language-of-training advantage nor challenged it radically. The first group showed a significant language-of-training advantage, however, the language of training was Slovak, which is also the subjects' first language. Although the overall slower performance of the English-trained group might be interpreted as support for the first-language advantage, the careful study of the subjects' performance does not fully confirm this explanation.

Nevertheless, the analysis revealed certain tendencies in the behaviour of students in relation to the language of instruction. If a subject received English training he/she was more likely to perform equally well in Slovak and in English. If a subject received Slovak training, he/she was more likely to perform significantly faster when tested in Slovak than in English. In other words, the subjects trained in English found it easier to generalise between Slovak and English. On the contrary, the subjects who received Slovak training found it harder to generalise their mathematical skills (facts) into the untrained language than did the English-trained subjects. This is a highly interesting finding, when we consider the fact that all subjects shared the same level of English, same level of mathematical competence and the same amount of training on the new problems. This suggests that it was not only the exact facts that were measured in the tests as this knowledge was at least partly language-specific, i.e. was connected with a particular language.

As seen in Figure 3, the three testing conditions (English-English, English-Slovak, Slovak- English) yielded very similar results. The possible explanation underlying this effect might lie in the language mode (see 3.1.1.1), i.e. the state of activation of the bilingual's two languages. As was already argued, the performance of the Slovak-trained and Slovak-tested subjects exceeded that of the subjects in other testing conditions as the subjects could draw on their habit of performing mathematics in Slovak (their first language). Although thus their training was not hindered by any cognitive challenges, this also 'cemented' their performance in the monolingual mode, i.e. only their first language (Slovak) was activated in this subject area.

On the contrary, the English-trained group's monolingual condition was challenged from the very beginning and the bilingual activation (and acquisition) of the learned facts was encouraged. The learning of new problems required the subjects to use simultaneously both, their prior knowledge of arithmetic (habitually performed in Slovak) and their knowledge of English. The bilingual mode thus activated appears to last through the two days of the experiment and could account for the easy switching between the two languages in tests.

In comparison, the Slovak-trained subjects encountered problems with switching between their two languages and their slower mean reaction times on English test suggest that they might have employed inner translation or partly calculated the problems anew.

The notion of bilingual mode is closely connected with language competence. The difference found between English and Slovak-trained groups provides further evidence for the varying level of the bilingual's language competence in relation to subject-areas. Although the arithmetic operations involved only vocabulary and grammar that the subject had already mastered, the group not explicitly trained to use it in mathematics was significantly hindered in their efforts to use their knowledge in this particular subject-area.

Moreover, on the whole, the group who most profited from the training appeared to be the Slovak trained group when tested in Slovak. This confirms the assumption of the first language advantage at this level of proficiency when performing exact large addition. However, the difficulties of the group trained monolingually in their first language also support the hypothesis of the disadvantage of first language education when the content knowledge is tested in a foreign language.

3.1.4.3 *Generalisation of knowledge across the problem types*

The research into the behaviour of subjects on the semi-trained and untrained problems revealed two sets of findings and suggested an important direction for further

research. The reactions on the untrained problems confirmed that all subjects benefited from the training regardless of the language of the test. In this way, the untrained problems provided an important control measure for the validity of the experiment results. The subjects' responses on the semi-trained problems suggested a possibly different role of memory in relation to the training delivered in the subjects' first language as opposite to that delivered in their second language. Also, the functioning of memory could interact with the language in which the prior education in the subject-area was acquired.

3.1.5 General discussion

In line with the findings reported from previous research, the study confirmed the role of language in learning exact facts. The data collected in the study suggest that the representation of the learned information is not universal. On the contrary, it is dependent on the specific language input. The data indicate that although the children learn the same content material their ability to use this material/knowledge differs in relation to both whether they are required to use this knowledge in Slovak, their L1 or English, their L2, and whether they are required to perform in their trained or untrained language. The statistical analyses confirmed that the differences in performance could not be attributed to individual differences in language learning. These observations might carry important implications for the language learning practice.

First, the further evidence for the interdependent nature of language competence in a specific area and the content-knowledge in this area is highly significant and relevant for the CLIL practice. Here, it is important to realise, that this interdependence is of a deeper nature than is traditionally admitted, i.e. it challenges the assumption that after a relevant terminology and academic language skills are provided, the knowledge gained in L1 (Slovak) can be easily 'translated' into (used in) L2 (English).

Despite the fact that the arithmetic problems learned by students in the present experiment required a minimum of vocabulary knowledge, the use of which was, in addition, highly repetitive, the subjects trained in English reacted slower than the subjects who were allowed to work in their first language only (the Slovak-Slovak testing condition). Moreover, the Slovak-trained subjects proved that they are not so ready to switch into their other language (English) as they failed to demonstrate equal mastery of the content in the English test. The students experienced difficulties when required to work in their second language in both cases, when this was the language in which they received some prior training (English-trained group) as well as when they were required to use it on a single occasion (the Slovak-trained subjects in the English test).

These results call for careful strategy in launching the CLIL programme. If the implementation of CLIL lacks consistence and planning i.e. if the language in which school subjects are taught randomly varies across subjects or across years (for example, the case when Biology is taught one year in Slovak, the following year in English, etc.), students might continually experience an increased learning and cognitive load. This practice might in some respects even interfere with the learning of content knowledge as well as result in highly unbalanced language competence even within one subject area. Moreover, the frustration accompanying such learning might further affect student's approach to learning (i.e. weaker motivation, decrease in effort) and thus hinder the student's attainment.

Second, the evidence of language and content interdependence must be also considered in the CLIL testing and evaluation practices. Although teachers may argue that they are able to control for the language difficulty when testing the content (Met, 1999), the experiment showed that even in the tasks in which apparently only a minimum level of second language proficiency is involved, the subjects' attainment differ. Thus, while it may not be possible to disassociate the language and the content learning, allowances should be made for their interaction. The educators should be careful especially when comparing the results of students whose whole education was realised in their first language with the results of students who received some form of bilingual education. This

consideration should be emphasised, above all, in situations in which the performance (mastery of content knowledge) of students who were each trained in different languages is compared on the basis of a test administered in only one of these languages.

Today, the difference in the students' performance is rarely traced back to the language in which they learned the information. However, while a single educational institution can adopt special measures to accommodate for these differences in learning in internal examinations, it is unclear how the students' performance might be affected if they are required to perform outside this institution in a language other than that of their training. This may be the case of entrance exams for a secondary school or for a higher education institution, or when the student transfers into a different school, etc. Here, the performance of the students trained only in Slovak might exceed the performance of bilingually trained students. These questions warrant further attention of the CLIL theoreticians as they might influence considerably the students' attainment as well as the students' satisfaction with the programme.

Third, the study yielded an evidence concerning the ability of the English-trained subjects to perform equally well in both of their languages (This however does not challenge the above-described argument, as on the whole, the performance of the English-trained group on both Slovak and English test was considerably slower than the performance of the Slovak-trained Slovak-tested subjects.) Unless they employed different strategy when calculating in English and in Slovak, their results suggest that they formed the information representation in both of their languages.

This could be explained by the fact that the large part of the knowledge necessary to complete the task (e.g. operations involving addition, the knowledge of number words and the habit of using them in a particular language) was already formed in their first language (Slovak) during their prior education. The English training enabled them to activate (re-learn) this knowledge in their second language (English) and apply it to the calculation of new problems. This could be interpreted as a positive finding as the English-trained subjects appeared to benefit from the learning in L2, while also retaining

the ability to perform equally well in their first language. In this respect, no first language attrition was confirmed.

Although nothing in the present study suggested this tendency, changes in the balance of first and second language competence after a longer training in the second language cannot be ruled out. The dominance of the second language can be expected especially in more specialised subject areas, as these are not likely to be practiced outside school (assuming that L2 is not the language of the environment.)

Finally, it must be noted that the reported results should be interpreted primarily in relation to a particular group of learners defined by their age, the level of English proficiency and the particular conditions of language learning (i.e. 'bilingual' secondary school). Nevertheless, as these represent a large group of learners, this study carries strong implications for the language education in general.

3.2 Survey

This part will focus on investigating affective factors such as learner beliefs or learner anxiety that influence the individual learner differences and which will be examined in relation to the Content and Language Integrated Learning. In the previous section (3.1.4.), the outcomes of the experiment highlighted several cognitive issues in simultaneous processing of language and content (such as language-dependent nature of the content learning) and the way they might affect the learner performance in relation to the language of learning (bilingually as opposite to monolingually trained subjects). However, it would be mistaken to seek the causes for the difference in the performance (achievement) between the Slovak-instructed and English-instructed learners merely in cognitive dimension. As Kees de Bot reminds us,

it is in a way attractive to view our language production system purely as a language production machine, but this is evidently too simple a picture: lexical access, grammatical complexity, and phonological encoding do not take place in a socio-psychological vacuum" (de Bot, 2000: 229).

Attitudes and views of learners are therefore of vital importance in relation to the whole CLIL process.

The CLIL setting represents a specific learning condition characterised for example by the increased cognitive load during the processing of information in foreign language as well as an increased learning load. Although the policy-makers and CLIL theoreticians remain optimistic as to the learners' ability to overcome these by means of increased motivation and effort, it, however, remains unclear whether this optimism can be justified by the examples from the CLIL practice. This study attempts to bring further information on the learner perception of CLIL education, especially in the area of evaluation and achievement.

3.2.1 Preliminaries

Learner Beliefs

Learner beliefs are beliefs that the learners hold about the nature of the learning process, their own language aptitude, difficulty of language learning, effective ways of learning, etc. These beliefs have the potential to influence both the learners' experience of the learning process as well as their actions as language learners. Learner beliefs are central for understanding the learner approaches as well as their satisfaction with their performance (Horwitz, 1999). Many articles even argue for "the central role in learning experience and achievements" played by beliefs that learners hold about the process (Cotterall, 1999: 494). Cotterall quotes a number of studies that provide strong evidence for relationship between beliefs and performance. According to Puchta (1999 quoted in Tercanliogu, 2005) "beliefs are guiding principles for our students' behaviour and strong perceptual filters.....they act as if they were true." Victori and Lockhart (1995) discuss the effect that "negative or limited beliefs" might have on the language learners:

If students develop or maintain misconceptions about their own learning, if they attribute undue importance to factors that are external to their own actions....they are not likely to adopt a responsible and active attitude in their approach to learning and may never become autonomous (Victori and Lockhart, 1995: 225).

The impact of the beliefs on the performance can be observed in two ways: (1) Beliefs can directly influence learners' behaviour and actions (i.e. learner strategy, effort, learning style, overall activity, etc.), and (2) beliefs can influence psychological factors (i.e. motivation, anxiety, willingness to communicate, etc.) that predict performance of the learners.

Learner Anxiety

Similarly to learner beliefs, language anxiety can play a significant causal role in creating individual differences in both language learning and communication. As was found in several studies (cf. Ellis, 2004, Cotterall, 1999, MacIntyre, 1995), the learners' performance is particularly prone to be influenced by anxiety which is connected either to learner beliefs or to learner performance in the classroom. Anxiety is an affective variable generally present in the learning situation. Learner anxiety is usually characterised by "feelings of tension and discomfort", "negative self-evaluation" and "tendency to withdraw in the presence of others" (MacIntyre, 1995: 91). Among the effects of experiencing anxiety is the decrease in cognitive processing ability.

The studies distinguish two types of learner anxiety: trait anxiety and situational anxiety. Trait anxiety is a "stable predisposition to become anxious in a wide range of situations." The situational anxiety is "immediate, transitory emotional experience with immediate cognitive effects" (MacIntyre, 1995: 93, cf. also Ellis, 2004). In this study, the inbuilt tendency of learners to feel anxiety will not be further examined as this personality trait is only partly affected by a particular classroom environment. On the other hand, the situational anxiety results directly from the particular learning conditions and as such can be researched in relation to a particular foreign language learning model.

In addition, it is argued, that "foreign language classroom anxiety constitutes a particular kind of situation anxiety, one that is distinct from classroom anxiety in general" because "being required to use an L2 when proficiency is limited constitutes a threat to learners' 'language-ego'" (Ellis, 2004: 539, cf. also Guiora, 1990). This anxiety in language classroom can result in a number of negative effects such as decreased rate of vocabulary learning (MacIntyre, 1995). It can also impair the ability to take in information, process it, and retrieve it when necessary (MacIntyre and Gardner, 1991 described in MacIntyre, 1995). It furthermore limits the use of both short-term and long-term memory (MacIntyre and Gardner, 1994, MacIntyre, 1995). As a result, "those who do not experience anxiety

will be able to process the information more quickly, more effectively, or both compared to those who are distracted by task-irrelevant cognition" (MacIntyre, 1995: 91).

Although number of studies revealed that anxiety is associated with problems in second language learning, the authors dispute as to the nature of the relationship, in particular, whether anxiety is the cause or the result of the problems in learning. Some researchers (for a comprehensive review see Ellis, 2004, and MacIntyre, 1995) have argued, that anxiety is merely a side-effect (consequence) of problems in language learning. This view, however, cannot account for the fact that anxiety is reported also by successful learners (MacIntyre, 1995, Ellis, 2004). A similar issue of causality emerged in the studies of learner belief. Although the association is indisputable, the studies are unable to establish the causal direction of the relations. Consequently, the authors come to the conclusion that the relationship between both anxiety and learner beliefs on one hand and performance and proficiency on the other, is cyclical and recursive, with each factor influencing the other.

It must be emphasised that learner beliefs as well as language anxiety are amendable to pedagogical influence. However, in order to influence these affective factors the teachers need to be aware of what their learners' beliefs are as this will enable them to assist the students in changing their views into positive and motivating influences.

3.2.2 Purpose of the study

In this study, I will explore the beliefs which are held by the students who learn one or more subjects in a foreign language. While there are many studies concerned with the learners' beliefs and experience according to a particular situation or due to cultural influences, there are only few concerned with the general experience that may be shared by the CLIL students. The findings from the prior studies can only partly be generalised to the CLIL setting as they do not reflect the particular situation of a CLIL learning experience, which is characterised by the dual-focused learning of language and subject-

matter and, hence, by a dual-focused evaluation of the performance both in language as well as subject-matter.

The study also seeks to explore into what extent the students experience language anxiety that could potentially hinder their effort. As argued above, the need to perform in a not perfectly mastered language creates a particular kind of situational anxiety. Thus, it can be expected that when the learners are simultaneously concerned with performing in subject-matter and language, the language-related anxiety could affect their activity and performance in the subject-matter. The study also seeks to uncover possible areas that are associated with anxiety in language learners. These areas need to be identified in order to see which learner beliefs need to be addressed actively within the educational process.

3.2.3 Design of the questionnaire

The questionnaire was designed primarily to target learner beliefs about the CLIL education on the basis of their own experience. In particular, the learner beliefs about their assessment (testing) and about their attainment in language and subject-matter were explored.

The questionnaire also investigated the learner anxiety in the lesson. Other items included in the questionnaire concerned learners' attitude to English learning and their learning strategies in order to see whether there are any links between these factors and learner beliefs and anxiety.

In designing the questionnaire items (i.e. the individual questions), three direct sources were used: (1) The Strategic Inventory for Language Learning (SILL) (Oxford, 1990) which is a standard instrument for measuring learning strategies that are considered beneficial for successful language learning. (2) The Beliefs about Language Learning Inventory (BALLI) (Horwitz, 1987) which is a widely used standard questionnaire designed to investigate five areas of learner belief that might influence the performance of the learner. (3) A questionnaire designed to examine the experience of learners in CLIL

setting (Tzvetkova, Kirilova, 2005) which focused particularly on the learners' beliefs about their achievement in language and subject-matter.

The questionnaire was administered in Slovak to ensure that the subjects fully understood the questions. The questionnaire consisted of 36 items and was divided into three main sections A, B and C, with the third section further divided into five parts (see the Appendix D). The questionnaire was semi-structured, containing three types of items: a) items that required the subjects to underline the true statement in reference to themselves, b) open items requiring the subjects to describe their learning style and c) items asking the subjects to read a statement and answer how truly it describes their behaviour, emotions and experience in the particular class on a five-point scale from "Never or almost never true of me" to "Always or almost always true of me."⁷ Following the criticism of the reliability of the standard Likert five-point scale (Ellis, 2004, Block, 1998), the scale used in Oxford (1990) was used instead allowing a better clarification of the points of the scale.

The first and second sections (section A and B) included questions about students' background information and their proficiency in English (the grade in English, self-reported proficiency) and the grade in the CLIL subject to which the student referred in the questionnaire.

The third section (section C) was further divided into five parts each of which sought to investigate different factors related to the student's learning habits, beliefs and experience with the CLIL programme as demonstrated on a particular subject. These five parts investigated the following five areas: (1) the student's attitude to the school subject taught in English, (2) the learner strategy used in this school subject, (3) behaviour in the classroom and the presence of anxiety, (4) beliefs about evaluation in CLIL, and (5) general achievement in both language and content.

⁷ The full scale (Oxford, 1990): 1, Never or almost never true of me; 2, generally not true of me; 3, somewhat true of me; 4, generally true of me; 5, always or almost always true of me.

The first part contained five items adapted from SILL (Oxford, 1990) or designed by the author to reflect the specific conditions of Slovak secondary education. This section served partly to gather further facts concerning the learner's attitude towards the school subject. The findings from this section were important in order to eliminate subjective factors such as dislike for the subject or for the particular teacher when interpreting the students' beliefs and experience with CLIL.

The second part contained eight items adapted from SILL (Oxford, 1990). This part examined learner strategy in the foreign language classroom. When correlated with the language learning beliefs and attitudes, it could reveal whether any learning strategies or actions are related to particular beliefs or experience.

The third part contained nine items adapted from SILL (Oxford, 1990) and BALLI (Horwitz, 1987). The items investigated the learner's behaviour in the lesson and particularly their tendency to anxiety during the lesson.

The fourth part contained seven items (author-designed or adapted from the CLIL questionnaire designed by Tzvetkova, Kirilova, 2005) concerning directly the experience with CLIL evaluation and testing. This part sought primarily to investigate how students perceive the dual-focused evaluation where both the language and the knowledge of the subject-matter interact, and whether they perceive any problems in this interaction (especially, since it was identified as a problem area in the theoretical research cf. Ellis, 2004, Horwitz, 1999).

The last part contained five items (author-designed or adapted from the CLIL questionnaire [Tzvetkova, Kirilova, 2005]) questioning the students' subjective perception of their development and attainment in the subject. These items again reflected the dual-focused learning, which should be beneficial for both subject-matter and language learning. As described in the theoretical part (3.2.1.), the various versions of CLIL might place prevalent emphasis on either language learning or the subject knowledge. This part of the questionnaire, therefore, also sought to illuminate in what way the learners perceive this dual commitment and what they believe about the nature of their learning outcomes.

3.2.4 Subjects

The subjects in the study were 47 students of Evanjelické Gymnázium in Tisovec (Slovakia), a secondary school with enhanced learning of English (the so called 'bilingual secondary school'). All subjects acquired their English via formal instruction in elementary or secondary schools. The group consisted of 13 male (27.7%) and 34 female participants (72.3%) - the proportion of male and female participants could not be balanced as it reflects the gender situation in this type of secondary schools. The age of the participants ranged from 15 to 20. Twenty-eight participants were in their second year of study (59.6%), ten in their third year (21.3%) and nine in the fifth, final year of study (19.1%). The age of acquisition ranged from 4 to 16. However, the majority of participants started learning English at the age of 10-11 (40.4%) and 15-16 (29.8%), i.e. in the fifth grade of the elementary school or in the first year of the secondary school.

The subject-matters taught in English were Biology (46.8%), Religion (19.1%) and History (34%).

The questionnaire was administered during a normal lesson by the researcher. Subjects received oral instructions about how to complete the questionnaire and were encouraged to seek clarification of any items they did not understand. The questionnaire as well as the instructions were in Slovak.

3.2.5 Data analysis

The quantitative data were analysed using descriptive and inferential statistics. The following statistical procedures were used to calculate the results: (1) descriptive statistics including frequencies and percentages to summarise the general tendency in the responses, (2) cross-tabulation was used to examine the relationship of two particular variables and (3) Pearson's correlation analysis was conducted to examine the relationship between the belief factor, anxiety, learning strategy and attitude towards the CLIL subject.

Nevertheless, it is important to realise that while correlation analysis can reveal an association between two variables, it cannot show the causal direction of the relationship which thus remains open to interpretation.

3.2.6 Results

This section reports on the subjects' responses in Part C of the questionnaire. After a preliminary review of the data, selected items were not further analysed as they presented qualitative data, data which could not be analysed by the selected statistical tools or data which did not contribute to the main discussion.

The results are presented in relation to the five sub-sections and the dimension they were designed to investigate. In the following discussion, the subjects' responses in column 1 and 2 ("I never do this" and "I usually do not do this") and responses in column 4 and 5 ("I usually do this" and "I always do this") are usually presented together in order to show the general tendency of the subjects' responses. (The full scale: 1 Never or almost never true of me, 2 Generally

3.2.6.1 *Attitude towards the CLIL subject (Items 6, 7, 8, 9)*

These items concern the facts about and attitude held by the learners towards the subject taught in English. Table 6 shows that half of the students like the subject (Item 7: 50%) and just under half of the students (47.6%) like the way the teacher teaches the subject (Item 8). Nearly half of the students are planning to take the general leaving exam ("maturita") in this subjects (Item 6: 44.7%). Given this positive attitude it was surprising, that 42.8% learners would prefer this particular subject to be taught in Slovak (Item9).

Table 6

	1	2	3	4	5
6 I intend to take the general leaving exam in this subject.*	51.1				44.7
7 I like this subject.	14.3	9.5	26.2	28.6	21.4
8 I like the teacher's approach in this subject.	11.9	14.3	26.2	21.4	26.2
9 I would prefer this subject to be taught in Slovak.	19.0	14.3	23.8	9.5	33.3

Responses expressed as percentage of total population.

*1, no; 5, yes.

A correlation analysis revealed a moderate negative relationship between the wish to have the subject in Slovak (Item 9) and liking the subject (Item 7) ($-.347$, $p < .01$) and liking the teacher's approach (Item 8) ($-.558$, $p < .000$).

Table 7 Selected results of correlation analysis

	Item 7: I like this subject	Item 8: I like the teacher's approach in this subject
9 I would prefer this subject to be taught in Slovak.	$-.347^*$	$-.558^{**}$

* $p < .05$, ** $p < .01$

Table 8 Selected results of correlation analysis

	Item 8: I like the teacher's approach in this subject
23 I feel embarrassed when I speak in English.	$-.166$ n.s.
30 I think that my grade in this subject is influenced by my level of English.	$-.101$ n.s.
31 If we had exams in Slovak, my results would be better.	$-.211$ n.s.

* $p < .05$, ** $p < .01$, n.s. - not significant

Further analysis also revealed (Table 8) that there was no significant correlation between the liking the teacher's approach and the anxiety subjects experience in class (Item 23), belief that their English proficiency influences their results in the school subject

(Item 30) or belief that their results would be better if they were tested in Slovak (Item 31). Cross-tabulation further confirmed that there was no significant difference in the responses according to the intention to take "maturita" in the subject (Item 9, $\chi^2=4.550$, $df=4$, $p<.337$ n.s., and Item 8, $\chi^2=6.507$, $df=4$, $p<.164$, n.s.). A moderate relationship was found between liking the subject (Item 7) and the intention to take 'maturita' in it (Item 6) ($\chi^2=13.717$, $df=4$, $p<.000$).

3.2.6.2 *Learner strategy and action (Items 4, 10, 11, 12, 13, 14, 15, 16, 18, 20, 25)*

These items focused on the learner actions (strategy) in relation to the behaviour that enhances language learning (cf. Oxford, 1990). The results reported in Table 9 show that from among active learner behaviour the majority of students reported only making notes in English (Item 11: 71.5%). Other variables representing active learning attitude such as seeking further information on the subject in English (Item 12: 33.3%) or preparing for the language in the school subject (Item 15: 35.7%) were reported only by one third of the subjects. Further, only one fifth reported trying to think about the subject in English (Item 10: 19.1%). In contrast, a majority of the subjects stated that they attempt to understand English without inner translation (Item 13: 69%).

Table 9

	1	2	3	4	5
10 I try to think about the subject in English.	7.1	40.5	33.3	16.7	2.4
11 I take notes in English.	11.9	11.9	11.9	26.2	38.1
12 If I look for further information about the subject, I make use of English materials.	23.8	21.4	21.4	23.8	9.5
13 I try to understand what I have heard or read without translating it word-for-word into Slovak.	2.4	16.7	11.9	35.7	33.3
15 As part of the preparation for the subject, I also learn the language (vocabulary, grammar, etc).	2.4	31.0	31.0	14.3	21.4
22 I have enough opportunities to communicate in English during the lesson.	2.4	4.8	19.0	25.7	38.1
25 My participation in this lesson is comparable with my participation in other lessons.	16.7	23.8	26.2	19.0	14.3

Responses expressed as percentage of total population.

Reporting on their class behaviour (and activity), more than 40 percent (40.5%) of the subjects consider themselves less active in this lesson than in Slovak-instructed lessons of similar type (Item 25), although a majority of the learners (63.8%) expressed the view that they have enough opportunities to communicate in English in this subject (Item 22). A correlation analysis also revealed a moderate negative relation ($-.547$, $p < .000$) between the activity in lesson (Item 25) and the wish to have this subject in Slovak (Item 9) indicating that the less active students would prefer Slovak instruction (or that the students who choose to remain passive in the lesson are also more likely to prefer Slovak instruction in the subject). A positive moderate relationship ($.455$, $p < .001$) was also found between the activity in the lesson and liking the teacher's instruction (Item 8) in which the students who described themselves as less active also expressed the dissatisfaction with the teaching. Further moderate negative relationship ($-.530$, $p < .000$) was found between Item 16 (the preparation for the lesson requires more time because it is in English) and the activity in the classroom (Item 25) indicating that students who report spending more time in preparation are less active during the lesson. Finally, a weak positive relationship ($.351$, $p < .01$) was found between the level of self-reported proficiency (Item 2) and classroom activity (Item 25), i.e. those who report higher proficiency are also more likely to participate in the lesson equally to the Slovak lesson.

Table 10 Selected results of correlation analysis

	Item 25: In this lesson I am as active as in a similar Slovak lesson
2 Self-reported level of proficiency.	.351*
8 I like the teacher's approach in this subject.	.455**
9 I would prefer this subject to be taught in Slovak.	-.547**
16 As the subject is in English the preparation for the lesson takes me more time.	-.530**

* $p < .05$, ** $p < .01$

Table 11

18	When talking to my classmates I speak in Slovak	72.3
18	When talking to my classmates I switch between English and Slovak	27.7

Responses expressed as percentage of total population

In the study, more than one quarter of the students reported that they switch between the two languages when talking to their classmates (Item 18: 27.7%). Further cross-tabulation analysis revealed that this behaviour was not influenced by the presence of a native speaker of the language (Item 5) ($\chi^2=.372$, $df=1$, $p<.542$, n.s.) or by the self-reported level of proficiency (Item 2) ($\chi^2=.571$, $df=2$, $p<.752$, n.s.). The effect was found, however, in relation to the class, i.e. age of the students when the older students were found to report significantly more code-switching than did the students in lower years ($\chi^2=.17.950$, $df=2$, $p<.000$), indicating that more years spent in the bilingual setting contributed to the development of an interlanguage and bilingual condition of the students. Also, a moderate positive correlation (.444, $p<.002$) was found between the age of the learners and the tendency to seek further information about the subjects in English (Item 12) (Table 12). This would suggest a growing involvement with the second language according to the years spent in bilingual environment.

Table 12 Selected results of correlation analysis

	Age
12	If I look for further information about the subject, I make use of English materials. .444**

* $p<.05$, ** $p<.01$

Table 13 Selected results of correlation analysis

	Item 12: If I look for further information about the subject, I make use of English materials.	Item 13: I try to understand what I have heard or read without translating it word-for-word into Slovak.
4 I am in contact with English also outside the classroom	-	.547**
10 I try to think about the subject in English	.356*	-

* $p < .05$, ** $p < .01$

The correlation analysis (Table 13) revealed a moderate positive relationship (.547, $p < .000$) between contact with English outside the school (Item 4) and trying to understand English without translation (Item 13). Also a weak positive correlation (.356, $p < .01$) was found between Item 10 (I try to think about the subject in English) and Item 12 (seeking further information about the subject in English)

3.2.6.3 Language anxiety (16, 22, 23, 24, 25, 26, 32)

These items investigated the tendency to learner anxiety in language lesson especially in oral activities. Table 14 shows very stable results in most areas. The results revealed that one fifth of the learners feel nervous (Item 26: 23.8%) or ashamed (Item 23: 19%) when they are required to speak in the lesson and report difficulties with trying to articulate their ideas in English (Item 24: 19%). Only one fifth of the learners never feel anxiety in the lesson (Items 23: 21.4% , Item 26: 26.2%).

Table 14

	1	2	3	4	5
16 As the subject is in English, the preparation for the lesson takes me more time.	14.3	28.6	9.5	28.6	19.0
22 I have enough opportunities to communicate in English during the lesson.	2.4	4.8	19.0	25.7	38.1
23 I feel embarrassed when I speak in English.	21.4	35.7	23.8	7.1	11.9
24 I find it difficult to articulate my thoughts in English.	14.3	40.5	23.8	11.9	7.1
25 My participation in this lesson is comparable with my participation in other lessons.	16.7	23.8	26.2	19.0	14.3
26 I feel nervous when I have to speak in English.	26.2	31.0	19.0	9.5	14.3
32 If we had exams in Slovak, I would be less afraid of the tests.	21.4	31.0	21.4	16.7	7.1

Responses expressed as percentage of total population.

The correlation analysis between the anxiety variables (Items 23,24,26) and the language of testing (Items 27, 31, 35) revealed moderate positive correlation (see Table 15 for the individual correlations, all $p < .01$) indicating that students who feel more anxious would prefer to be tested in Slovak, think that their test results would be better if they were tested in Slovak and likewise think that their knowledge would be better if instructed in Slovak. Further, one fifth of the student believes that their anxiety would be smaller if they were tested in Slovak (Item 32: 23.8%) (see Table 14), confirming that they attribute their fear of test partly to the language requirement.

Table 15 Selected results of correlation analysis

	Item 23: I feel embarrassed when I speak in English.	Item 24: I find it difficult to articulate my thoughts in English.	Item 26: I feel nervous when I have to speak in English.
27 I would prefer to have exams in Slovak.	.460**	.345*	.473**
31 If we had exams in Slovak my results would be better.	.277 n.s.	.217 n.s.	.302*
35 My knowledge of the subject would be better if the subject was in Slovak.	.357*	.261 n.s.	.406**

* $p < .05$, ** $p < .01$, n.s. – not significant

Table 16 Selected results of correlation analysis

	Item 25: My participation in this lesson is comparable with my participation in other lessons.
23 I feel embarrassed when I speak in English.	-.425**
24 I find it difficult to articulate my thoughts in English.	-.387**
26 I feel nervous when I have to speak in English.	-.446**

* $p < .05$, ** $p < .01$

The correlation between the anxiety variables (Items 23, 24, 26) and the item examining activity in the lesson (Item 25) revealed moderate negative correlation (average $-.446$, $p < .002$) between the anxiety and self-reported activity in the lesson, i.e. the students who reported higher level of anxiety also state that they tend to be less active in this lesson than in a similar Slovak-instructed lesson (Table 16).

Table 17 Selected results of correlation analysis

	Item 4: I am in contact with English also outside the classroom.	Item 13: I try to understand what I have heard or read without translating it word-for-word into Slovak.
23 I feel embarrassed when I speak in English.	-.325*	-.401**

*p<.05, **p<.01

A weak negative relationship (-.325, $p<.02$) was found between contact with English outside the school (Item 4) and the item representing language anxiety (Items 23) indicating a link between the subject's attitude to English and the feeling of discomfort. This link was further confirmed by the moderate negative correlation (-.401, $p<.005$) between trying to understand without translating (Item 13) and feeling embarrassed when speaking in the lesson (Item 23).

It should be noted that although a weak relationship (average -.341, all $p<.05$) was found between the proficiency (Item 2) and some of the variables representing anxiety (Items 24 and 26), no relationship between either the subject grade or English grade and these two variables was found (Table 17 and Table 19). Nevertheless, a weak correlation was reported between feeling embarrassed when speaking English and the English grade (-.303, $p<.01$) (Table 13).

Table 18 Selected results of correlation analysis

	Item 2: Self-reported proficiency.
23 I feel embarrassed when I speak in English.	-.150 n.s.
24 I find it difficult to articulate my thoughts in English.	-.372*
26 I feel nervous when I have to speak in English.	-.301*

*p<.05, **p<.01, n.s. – not significant

Table 19 Selected results of correlation analysis

		Subject grade	English grade
23	I feel embarrassed when I speak in English.	-.152 n.s.	-.303*
24	I find it difficult to articulate my thoughts in English.	-.002 n.s.	-.071 n.s.
26	I feel nervous when I have to speak in English.	-.030 n.s.	-.075 n.s.

* $p < .05$, ** $p < .01$, n.s. – not significant

3.2.6.4 CLIL and assessment (Items 9, 27, 28, 29, 30, 31, 32)

The items in this section explored the learner beliefs about the impact of the language of instruction and testing on their performance. As apparent from Table 20, the responses to Items 27, 28, 31 and 9 show that the student population almost equally strongly holds two contrary opinions on whether the subject and its evaluation should be held in Slovak or in English. Thus, although nearly half of the students wishes the instruction and testing to be in Slovak (Item 27: 40.5%, Item 9: 42.8%), only one quarter is convinced that their performance is influenced by their level of English (Item 30: 28.6%). This view is further confirmed by 64.2% of students believing that their grade is determined mostly by their knowledge of the subject-matter (Item 29). However, still one fifth of the students (Item 32: 23.8%) state that they would be less afraid of tests if these were administered in Slovak.

Table 20

	1	2	3	4	5
9 I would prefer this subject to be taught in Slovak.	19.0	14.3	23.8	9.5	33.3
27 I would prefer to be tested in Slovak.	23.8	16.7	19.0	16.7	23.8
28 I'm happy with having exams in English.	11.9	23.8	21.4	23.8	19.0
29 I think that my knowledge of the subject matters most in the exams.	2.4	4.8	28.6	45.2	19.0
30 I think that my grade in this subject is influenced by my level of English.	11.9	42.9	16.7	23.8	4.8
31 If we had exams in Slovak, my results would be better.	11.9	31.0	16.7	23.8	16.7
32 If we had exams in Slovak, I would feel less afraid of the tests.	21.4	31.0	21.4	16.7	7.1

Responses expressed as percentage of total population.

Table 21 Selected results of correlation analysis

	Item 9: I would prefer to have this subject in Slovak	Item 30: I think that my grade in this subject is influenced by my level of English
2 Self-reported proficiency	-.275 n.s.	.013 n.s.

* $p < .05$, ** $p < .01$, n.s. - not significant

Table 22 Selected results of correlation analysis

	Item 2: Self-reported proficiency.	Item 28: I'm happy with having exams in English..
29 I think that my knowledge of the subject matters most in the exams.	.389**	.313*

* $p < .05$, ** $p < .01$

The correlation analysis examined (Table 21) whether the beliefs reported could be due to the proficiency of the subjects. The analysis found that proficiency (Item 2) was not significantly correlated with either the desire to have the subject in Slovak (Item 9) or the belief that the level of English influences the achievement (Item 30). Table 22 shows that the only weak positive correlation (.389, $p < .007$) was found between the level of English (Item 2) and the belief that the knowledge of content is more significant in determining

the achievement on the test (Item 29). This would suggest, that with increased proficiency the subjects become less conscious of the foreign language factor. This belief is further confirmed by a weak positive correlation (.313, $p < .03$) between Item 29 and preference for the tests in English (Item 28), signifying a slight tendency of the more proficient subjects to believe that their content knowledge plays the more important role and hence they do not mind being tested in English.

When the variables examining the preference for the language of testing and instruction were correlated (Items 27,31,32) the following findings were obtained (Table 23): The students wishing to have the subject in Slovak (Item 9) showed a strong positive correlation (.715, $p < .000$) with the belief that his/her results would be better in this language (Item 31), and with the belief that he/she would feel less anxiety in the test (Item 32) (.580, $p < .000$). Also, the subjects expressed a general wish for the subject to be in Slovak (Item 9, see Table 20). This result suggests that students would prefer to be tested in Slovak because they believe both, that they would experience less anxiety in the test and that their results would be better. This belief was not affected by either their grades in English and the subject or the level of proficiency (Table 24).

Table 23 Selected results of correlation analysis

	Item 31: If we had exams in Slovak my results would be better	Item 32: If we had exams in Slovak, I would feel less afraid of the tests.
9 I would prefer to have this subject in Slovak.	.715**	.580**

* $p < .05$, ** $p < .01$

Table 24 Selected results of correlation analysis

	Item 27: I would prefer to have exams in Slovak.
Grade in English	-.068 n.s.
Subject grade	.071 n.s.
Self-reported proficiency	-.190 n.s.

* $p < .05$, ** $p < .01$, n.s. – not significant

3.2.6.5 CLIL and general achievement in language and content (9, 34, 35, 36, 37, 38)

These items sought to investigate the learner beliefs about their achievement in language and content. Table 25 shows the results of the selected items.

Table 25

		1	2	3	4	5
9	I would prefer this subject to be taught in Slovak.	19.0	14.3	23.8	9.5	33.3
34	This subject helps me to generally improve my English.	4.8	11.9	26.2	31.0	26.2
35	My knowledge of the subject would be better if the subjects was in Slovak.	19.0	23.8	26.2	7.1	23.8
36	I improved mainly in the language.	7.1	9.5	50.0	33.3	0
37	I improved mainly in the content knowledge.	7.1	26.2	42.9	19.0	4.8
38	I think that if the subject was in Slovak we would get through more material.	21.4	21.4	21.4	26.2	9.5

Responses expressed as percentage of total population.

Subjects' responses clearly indicate the belief that this subject contributed to their overall level of English proficiency (Item 34: 57.2%). Also, the majority of the learner population believe that the course contributed equally to their language and content development (Item 36: 50% and Item 37: 42.9% in column 3). When questioned whether English could negatively influence the quantity of the content learned (Items 35 and 38), equal number of students were found to hold contrary beliefs, which together comprised more than 70 percent of all responses. This reflects the situation from the previous section (3.2.6.4), where equal number of students expressed preference for either Slovak or English instruction (and evaluation).

The correlation analysis between the belief that the students would benefit more from the instruction in Slovak (Item 38) showed a varying degree of negative correlation with the items representing active approach to learning English (Items 12, 13, 4) (average .323, all $p < .05$) (Table 26).

Table 26 Selected results of correlation analysis

		Item 38: I think that if the subject was in Slovak we would get through more material.
4	I am in contact with English also outside the classroom.	-.300*
12	If I look for further information about the subject, I make use of English materials.	-.323*
13	I try to understand what I have heard or read without translating it word-for-word into Slovak.	-.347*

*p< .05, **p< .01

Table 27 Selected results of correlation analysis

		Item 35: I think that if the subject was in Slovak we would get through more material.	Item 38: I think that if the subject was in Slovak we would get through more material.
9	I would prefer to have this subject in Slovak	.695**	.510**

*p< .05, **p< .01

3.2.7 Discussion

3.2.7.1 Attitude towards the CLIL subject

For those promoting CLIL, it is encouraging that on the whole, learners expressed a positive experience with the school subject in question and the teacher's approach. This is important as for almost half of the students the subject plays an important role as they intend to take the general leaving exam in it. These students might therefore be expected to judge the content of the even course more critically.

The surprising finding that nearly half of the students would prefer the subject to be taught in Slovak and another 23.8% would wish so half the time (see Table 6, Item 9, column 3), can be partly explained by the dislike for the particular subject (Item 7) or,

more strongly, by the dislike of the particular teacher's approach (Item 8). However, it is an interesting observation that a certain dissatisfaction with the subject or the instructor should be linked to the language of the instruction suggesting that the language is not perceived merely as a medium but interpreted as some deeper cause of the teacher's approach.

3.2.7.2 *Learner strategy and action*

As one of the CLIL objectives is to encourage learners' interest in learning the language and assist them in their endeavour, the findings were in some respects alarming.

They revealed that only one third of the students actively seek improvement in English (Items 10, 12, 15). Although nearly 70% of the students reported regularly engaging in activities beneficial to the learning of English such as taking notes in English, trying to understand without inner translation (Table 9), none of these requires special autonomous learner action. Understanding without translation happens in more advanced stages of learning rather spontaneously. Taking notes in English might be preferred for the simple reason that the lesson is held in this language or the teacher dictates them in English. These responses seem to provide evidence that the subjects do not readily assume responsibility for their learning and do not actively seek to manage their own learning.

However, promisingly, the study also revealed that the activity of students is on the increase with their age when the older students appear to make more use of their bilingual education. These students show a positive attitude towards a fuller involvement with English and they also reported more code-switching during the lesson (see 3.2.6.2) – a characteristic of bilingual behaviour. In addition, they were more likely to seek information in English and to try to think about the subject in English (3.2.6.2). Although the study conducted by Tzvetkova and Kirilova (2005) found that students' attitude to CLIL does not depend on the age factor, it appears from the present study that although

the general beliefs do not change, the actions of learners do show certain development in direction to self-directed, more autonomous learning.

Concerning learners' activity in the classroom, it is interesting to note that 40.5% of the respondents believe themselves to be less active in the English lesson than they would be in a similar lesson if taught in Slovak, although only 7.2 % reported that they do not have enough opportunity for communication and participation in this lesson (Table 9). This discrepancy can reflect that although the students believe they have the space to communicate they do not choose to use it, or that the students underestimate their own participation in the process. A small part of the decreased activity, real or believed, can be attributed to the dislike of the teacher's approach (Table 7) . However, this belief might point to a more serious problem, i.e. the belief held by the students that somehow matters would be more favourable in the Slovak-instructed lesson.

Any intervention planned with respect to the subjects' responses should involve a shift in focus to active involvement in the learning process, in the classroom as well as outside the classroom. The reasons for greater passivity in the English-instructed lessons should be also questioned as the dislike of the subject or teacher's approach provides only small guidance as to the behaviour of the students.

3.2.7.3 *Language anxiety*

The items in this section attempted to uncover the extent of the learner anxiety in the particular CLIL environment as well as to identify areas which this anxiety is linked to.

One fifth of the population stated that they regularly feel anxious during the class. Also, further 20% reported that they feel discomfort half of the time (Table 14). In line with the prior findings, correlation analysis showed no correlation between either the grade in English, grade in the subject or the self-reported English proficiency (Table 18 and Table

19). This confirms the claim that both the successful as well as less successful students may experience anxiety in the CLIL class.

In the present study, anxiety in class was found to be connected with three factors:

First, anxiety was negatively linked to the activity in the class, where the students reporting more anxiety also reported being less active than they might be in a Slovak-instructed lesson (Table 16). This study did not examine the nature of the activity that the respondents had in mind or whether this did reflect the subjects' real behaviour in class. However, whatever the reasons, these responses carry strong implications for the students' assessment. It is evident that whether or not the anxiety can actually interfere with learning, as some of the studies argued (cf. MacIntyre, 1995), it can certainly affect the demonstration of the content knowledge by for example limited participation in various class activities (class discussions, class projects, etc.) that might be part of students' assessment.

Second, the reported anxiety was linked to the beliefs about the progress of learning and evaluation (Table 15). The subjects reporting higher level of anxiety show tendency to believe that both their results would be better if tested in Slovak, and also their knowledge would benefit if the class was instructed in Slovak. This suggests that these subjects perceive the problems not only in the output of the knowledge (in tests) but believe that also their input (learning) is negatively affected in the particular CLIL class.

Further, one fifth of the students reported higher anxiety connected to the fact that the exams take place in English (Table 15). The stress can be directly attributed to what was defined as the main cause of learner anxiety in language classes, i.e. the requirement to perform in a not fully mastered language (cf. MacIntyre, 1995). Thus the anxiety might result from the fact that both, content as well as sufficient proficiency in language must be demonstrated in the exam. Although mainly the anxiety related to production in a foreign language was highlighted in this respect (c.f. Ellis, 2005, Horwitz, 1999), the same reasoning might apply also to the input received in the less dominant language. A test administered in English might likewise cause language anxiety as the student is not able

to control the language used in the test (e.g. the student might fear that he/she will not understand the instructions in the test, etc.).

Third, the students reporting more anxiety slightly differed in their preparation for the lesson from the rest of the students. They reported that they spend more time in preparation for the subject and that they in particular prepare for the language of the lesson (Table 10). According to the previous studies (cf. MacIntyre, 1995), anxiety can act also positively when it results in the increased effort of the learners. A further analysis would be needed to confirm whether this is a plausible explanation for the causal relation observed here.

The data analysed in this section raised certain issues of direct attention to the language practitioners. Although the anxiety felt by learners in a CLIL class need not necessarily be higher than in a standard content or language class, it may have larger impact on the learners' performance as it can affect both their cognitive processing (i.e. the process of learning) and their ability to demonstrate their mastery of content as well as language. So far, teachers have few instruments available to help them analyse the causes underlying the learner's behaviour in particular class (e.g. questionnaires, interviews etc.) and this analysis is also not sufficiently encouraged. Thus, especially teachers oriented towards content instruction might not readily recognise some negative behavioural traits (e.g. passivity, apparent lack of interest, refusal to participate, etc.) as related to language anxiety.

A lack of assistance offered to the learners who experience anxiety could result in a resentful attitude towards content and language integrated learning and its practices which might be perceived as the source of their discomfort.

3.2.7.4 *CLIL and assessment*

Some items in this section revealed that testing in CLIL conditions (e.g. having tests in English, etc.) has almost equal number of advocates and opponents among the

surveyed student population (Table 20). Nearly one half of the respondents expressed preference for the tests to be administered in English while another 40% of the respondents would prefer to be tested in Slovak. A similar proportion of agreement and disagreement was revealed in reaction to the item questioning their preference for Slovak instruction in the subject (Item 9).

While no single explanation can account for this attitude, the present study revealed certain moderate tendencies in the beliefs held by the students.

First, the data indicate that the students who would prefer to be tested in Slovak also tend to think that in Slovak tests their results would be better. Also, they claim that they would experience less stress connected with testing (Table 23). However, at the same time, these students agree that their content knowledge is the prominent factor in deciding the grade, i.e. their proficiency in English does not affect their test results significantly (Table 20). In addition, although the dislike of the teacher's approach was found also to play a role in preference for assessment in Slovak, the further analysis of the responses ruled out the possibility that the preference for tests in Slovak could be traced to any unfair treatment by the teacher (i.e. the responses did not reveal any link between feeling of tension related to the liking or disliking the teacher that would be expected if the learner felt discriminated against by the teacher) (Table 8).

Second, the wish to be tested in Slovak was also related to feeling of discomfort (anxiety) in the classroom (Table 15). This relationship was in detail discussed in section 3.2.7.3.

Promisingly, these data suggest that students do not think that the requirement to perform in their L2 could negatively affect their attainment in the tests. However, their reasons for believing that if tested in Slovak their results would improve thus remain unclear. These findings indicate that a considerable number of students are not at ease with being tested in English whether they believe that this causes them more stress, it negatively contributes to their grades or they feel a general discomfort which is in relation to the teacher and his/her approach.

Whatever the reasons for this attitude the number of students who hold it is worryingly large suggesting that at least half of the students show preference for monolingual instruction and assessment. These results should be noted by language professionals as well as by language education decision-makers as further research aimed at uncovering the sources of dissatisfaction among students could help to address these sources consciously within the CLIL methodology.

3.2.7.5 *CLIL and general achievement in language and content*

It appears that a number of learners perceive the CLIL course as different from a standard content course taught in Slovak. This is reflected in the belief held by one third of the surveyed population that if the course was taught in Slovak they would be able to get through more material (i.e. there would be presented more content) and that their knowledge of the material would be better (Table 25). Although the subjects were not questioned explicitly whether these opinions are a reason for dissatisfaction, this interpretation is suggested by the fact that both beliefs were strongly correlated with the preference to have the subject in Slovak (Table 27). Naturally, perceiving the course as different is justified as it indeed qualitatively differs from a standard content course in method, aims and expected outcomes (i.e. involving both language and content learning). This dual-focused nature of the course reflected also in the students' responses where majority of the students agreed that it had contributed both to their content knowledge and language improvement.

These partly negative beliefs need further exploration. It appears that the students are not fully identified with the objectives of the course which include both content as well as language learning. The expectation that the social and pragmatic dimension and the communicative competence in the students' foreign language will benefit from CLIL represents an especially significant part of the objectives related to language learning. However, the students' belief that they would learn more and that their knowledge would

be better if the subject material was not presented in their less dominant language may suggest that 'knowledge' and 'learning' are interpreted mostly in respect to the acquisition of the content knowledge. If the CLIL course is judged solely according to the standards of monolingual content courses, the amount of material may appear smaller.

Indeed, the amount of content presented might be influenced in the CLIL courses. This may happen for example in CLIL courses consciously designed to favour the language aims rather than the content learning (e.g. sheltered model). Also, the content load might be reduced in order to facilitate the learning of subject-matter in a foreign language which should prevent the students from experiencing frustration from increased learning requirements. This condition might be only temporary, allowing the students to adjust to the intensive learning or might be limited only to a particular subject-matter for which this approach had been selected. However, some authors warn against an unconscious or longer-term 'watering down' of the content. Genesee (1994) reports the study conducted by Swain (1988) where the behaviour of teachers in immersion models was analysed and the findings revealed that the teachers unconsciously adjusted (limited) their level of English to that of their students which in effect stopped the learners' development and also functioned contrary to the mechanism expected to operate in CBI instruction. Genesee concludes that "without systematic plans, immersion teachers may adopt strategies that are not optimal for promoting language learning" (Genesee, 1994: 7).

Also, as the mastery of content knowledge might be considered as crucial by the subjects, the educators should not allow the English instruction to be viewed as an obstacle on the way to obtaining this knowledge. Steps must be taken to ensure that in the longer run, language mastery will not be gained at the expense of the content.

The data suggest that the students are not fully aware of the objectives of the course. Especially in the language area, the subtler language factors (e.g. pragmatic and sociolinguistic competence) might not be as readily appreciated by the students as are the more easily quantifiable knowledge traditionally emphasised in the language education (such as vocabulary learning, level of grammatical mastery). It is therefore vital for the teachers themselves to recognise the core benefits expected from CLIL in order to state

these as objectives for their students. Carver (1984: 128) argues that although “statements of objectives have become commonplace in language teaching” it is “perhaps still not yet accepted practice to make these available to the learner.” Without this emphasis on the learner awareness the instruction in English might be viewed as burdensome and perhaps easily interpreted as a scapegoat for possible shortcomings in the learning of the content.

3.2.8 General discussion

This study provided greater understanding of the learners’ perspective of the content and language integrated learning (CLIL). The data obtained in this study highlighted a number of areas that warrant further attention of the researchers as well as language practitioners.

On the whole, the study revealed that the beliefs held by the students with experience with CLIL were less positive than had been expected from the generally reported success of CLIL to create meaningful learning situations. It appears that the learners do not fully share the optimism of the language theoreticians concerning the implementation of CLIL. Among other, this might be caused by the imperfect understanding of the functioning and purpose of CLIL on the part of the learners. As argued above, the objectives of CLIL course are rarely formulated explicitly, although they could significantly contribute to the learners’ understanding of the nature of their achievement and in this way allow the learners to monitor their progress. This could then contribute to the greater satisfaction of the learners with the outcomes of their learning and also help to motivate the learners facing an increased learning load. As is the case now, many students in the survey perceive the CLIL subject more via its content aims. They believe that in terms of their content mastery they would profit more from a Slovak-instructed course and hence would prefer a course in their first language to a CLIL course.

Furthermore, the study also revealed that little guidance is available to learners in the CLIL setting. Although this practice might be limited to the particular school in which

the survey was conducted, it can be assumed that this reflects a general trend in Slovak education. However, with view to the increased cognitive and learning load created by the integration of language and content more than customary assistance might be required by the learners to enhance their learning effectiveness. The students' responses revealed certain passivity in their learning. The more active attitude to language acquisition was found among older students, whose actions revealed a more autonomous approach. The growing independence and self-direction in managing one's learning can certainly be attributed to the greater maturity of the older learners. The students in higher years are also likely to profit from a longer stay in the bilingual environment. However, students in lower years might also be more inclined to pursue these activities and strategies if they are made more aware of their significance for language learning. Also, activities such as searching for further information on the subject in English might be more intentionally introduced into the learning process so as to help the students to form positive learning habits. As Carver maintains (Carver, 1984: 128), "particularly important is the need for learners to reach agreement with the teacher on the amount of practice they will do out of the class. It is not always clearly appreciated that this is a vital element in successful language learning."

Finally, all of the issues raised above might play an important role in learners' attitude towards CLIL. Without clearly communicated aims and without assistance in overcoming difficulties that might result from CLIL setting, as well as if the positive guidance towards a more effective language learning techniques is lacking, the learners might accumulate feelings of frustration or confusion. This in consequence might result in negative attitude to the particular CLIL subject or CLIL as a whole. The present study revealed certain tendencies of learners to blame English as a medium of instruction for any perceived difficulties in the subject. As Tzvetkova and Kirilova (2005: 25) claim following the results of their study, a great number of students "tend to blame language as a medium, which makes learning difficult." This tendency was observed also in the present study where analysis of several responses suggested the somehow unspecified

feeling that Slovak-instructed lesson would be more favourable for matters such as classroom activity, test results and knowledge of subject-matter, etc.

The study confirmed the value of investigating learners' beliefs for the pedagogic practice. As was pointed out earlier, the learner beliefs can be changed by a teacher's influence. However, only when the teachers have the means for identification of these beliefs, and further, identifying the links between learners' beliefs and learner behaviour, can they engage in a fruitful discussion with the learner.

4 Conclusions

This section presents the conclusions from all three major parts of this thesis, viz. 2 Content-Based Instruction and Content and Language Integrated Learning, 3.1 Experimental Study and 3.2 Survey. The aim of this section is by no means to repeat the individual results, which are analysed and discussed in their respective sections. This section therefore concentrates above all on 1) the methodology employed in this thesis (4.1.) and 2) integrating and contrasting the results from the empirical parts which investigated cognitive and affective factors in CLIL (4.2).

4.1 *Methodological conclusions*

As regards to the methodology of the empirical research, two quantitative methods were employed: a controlled experiment and a questionnaire survey. Both methods proved beneficial for the research of content and language integrated learning although the data obtained via these two methods are also seriously limited in certain respects.

The main limitations of a psycholinguistics experiment used in pedagogical research lie in the fact that the outcomes of this research are not easily generalisable into wider context and cannot be readily translated into the practice of language learning. The results of these studies are often highly inconclusive and contradictory. Further, it is argued, that the laboratory conditions necessary in order to introduce controls on the subjects' performance can never replace realistic conditions and dynamics of the language classroom.

On the other hand, a controlled experiment allows to test separate variables which is rarely possible in the complex mechanism of the classroom interaction. In the experiment setting, a reaction to a selected variable can be elicited and recorded for a number of subjects.

The main limitation of the questionnaire survey is the fact that it is especially prone to yield skewed results, i.e. results that might be somehow affected by the particular conditions of the subjects' environment. Although, naturally, the specific characteristics of the subjects' environment represent an important factor in the subjects' experience, this makes the research of particular phenomena (i.e. various attitudes to CLIL) difficult. Especially, when the scope of the research is limited to one particular school, as is the case in the present study, the findings might be influenced by the particular strategies of the given institution in implementing CLIL, by group dynamics in the particular classrooms or among subjects, etc. Also, as the direct behavioural reaction of the subjects is not measured (as is the case in a controlled experiment), many factors can interact in the responses obtained. The format of a closed questionnaire might be in certain respects limiting as it does not provide space for the subjects to give the reasoning or justification for their beliefs.

On the other hand, the quantitative data that are a product of such questionnaire enable further analysis of the subjects' responses allowing to identify certain patterns in the responses or to construct 'profiles' for groups of respondents. Thus, when asking the learners' on their beliefs, it is possible to see whether these opinions differ according to age, gender, school attainment, etc.

This thesis tried to show that pedagogic research can benefit from both, the experimental as well as survey studies. Although the two methods tap into different areas of learner behaviour and their implications for pedagogic practice lie at different levels, both might become significant sources for everybody seriously interested in the development of language learning education.

4.2 Empirical conclusions

The present section discusses the areas which were highlighted in both, the empirical study as well as the survey. Findings from both studies highlighted the fact that

a special attention should be paid to the nature of interdependence between language and content learning. In both cases the foreign language is concerned in more ways than just a vehicle for content delivery.

The experiment data suggest that content knowledge based on exact facts is partly stored in a language-specific format. This means that a particular language environment might be more beneficial for its recall and use. This carries implications especially for the strategy of CLIL implementation into the school curriculum. Here, a careful planning should precede any introduction of a CLIL course, especially if this course is intended to fully replace a content course taught in Slovak. The learning under the CLIL conditions has significant implications for the learner's attainment in content mastery and can continue to affect the learner's performance in the particular subject area also after he or she leaves the school. In the light of these findings as well as the findings reported in psycholinguistic and applied linguistic literature, the large-scale implementation of CLIL that might result from the present emphasis on language proficiency should be preceded by further research into the functioning and outcomes of such learning and should be accompanied by further changes in the systems of education characteristic for various countries in the European Union.

The experiment and psycholinguistic literature pointed to an intricate relationship between language learning and content learning. It was therefore interesting to observe, whether this area was perceived also by language learners as somewhat problematic. As pointed out in the general discussion (see 3.2.8), English as the language of instruction was implicated by a group of respondents as a source of unspecified difficulties or dissatisfaction with the CLIL subject, although they could not attribute this to any specific feature of the CLIL subjects. (Often, however, it was associated with anxiety accompanying the use of the second language.) The reactions of the students could reflect the encounter with an increased learning load, which is expected to accompany the CLIL and CBI learning. However, if this increased learning load was due merely to insufficient proficiency in the foreign language the students could successfully overcome it by learning the relevant vocabulary and grammar. If the difficulties resulted from insufficient

academic English skills, again, these could be successfully practiced. However, the students expressing wish to have the subject in Slovak did not engage in linguistically oriented preparation for the class. This suggests that the perceived difficulty could in part originate in the language-specific format of their prior knowledge which cannot be employed to their satisfaction in the English-taught CLIL class. Also, the inability to readily activate their previous knowledge of facts could suggest a possible explanation for some of the believed or real lack of participation in the CLIL class. Naturally, these are only tentative conclusions and further research would be necessary to provide evidence in favour of or against it.

Both, the experimental study and the survey brought to attention the issue of assessment and evaluation of the learners. While the two previous paragraphs focused on the role of learning and knowledge use in general, both studies highlighted also the specific impact on the output of knowledge under the testing conditions. While the experiment showed how the output of knowledge is affected at the cognitive level (i.e. at the level of information processing), the survey emphasised the role of learner anxiety in the examination. The survey itself could not provide evidence proving the impact of language related anxiety on performance. However, the data obtained in the study provided evidence that students perceive the two areas, language related anxiety and fear of testing as linked.

The present study provided evidence for the fact that CLIL-instructed students might share certain characteristics in terms of cognitive and affective factors. It is encouraging that the two studies yielded some complementary information confirming the value of both methods.

Summary (Slovak)

Cieľom práce bolo priniesť poznatky o rýchlo sa rozvíjajúcom fenoméne v jazykovej výuke – metóde CLIL (Content and Language Integrated Learning). CLIL je definovaný svojím dvojitým zameraním na simultánnu výuku jazyka a predmetu, čím predstavuje nový trend jazykových programov zameraných na učenie sa cudzieho jazyka v kontexte jeho prirodzeného použitia. Najväčším prínosom CLIL do európskej praxe vyučovania jazykov je dôraz na sociologické a pragmatické aspekty jazykovej komunikácie, ale aj prepojenie učenia jazyka s celkovým rozvojom osobnosti žiaka.

CLIL bol inšpirovaný americkým a kanadským modelom učenia cudzieho jazyka skrz vyučovanie predmetu používaného v rámci imerzného vyučovania. Toto vyučovanie zdôrazňuje spontánne získavanie cudzieho jazyka v jeho prirodzenom prostredí. Pri imerznom vzdelávaní je vyučovanie v škole do veľkej miery podporované tiež faktom, že cudzí jazyk je zvyčajne zároveň dominantným jazykom spoločnosti, v ktorej sa žiak pohybuje. Aj z tohto dôvodu sa táto metóda vyhýba explicitnému učeniu jazyka, verí, že žiaka stačí usmerňovať a obrovský input cudzieho jazyka prirodzene vyústi v jeho osvojenie. CLIL v európskych podmienkach sa nemôže spoliehať na input jazyka z vonkajšieho prostredia. Prívetký input by bol sčasti aj neželaný, keďže u detí, ktoré prechádzajú imerznou výukou sa druhý jazyk často krát rozvíja na úkor jazyka prvého. CLIL podporuje diverzitu jazykov a kultúr, a pozornosť, ktorú venuje rozvoju prvého jazyka žiaka je súčasťou tejto filozofie.

CLIL rozoznáva rôzne kombinácie v integrovanej výuke odborného predmetu a jazyka. Nasledujúce tri modely reprezentujú hlavné tendencie v rámci CLIL (Brinton et al., 1989): a) *sheltered*, b) *theme-based* a c) *adjunct*. Tieto modely sa líšia v miere zamerania sa buď na jazyk (*theme-based*) alebo na výuku predmetu (*adjunct*). Tretí spomenutý model (*sheltered*) predstavuje istý stredný bod - snaží sa rovnocenne zohľadniť jazykové aj obsahové ciele výuky. Zameranie výuky sa silne odráža aj v zameraní hodnotenia, kde by miera skúšania z jazyka a predmetu mala rešpektovať ciele a reálnu náplň výuky. Avšak práve kombinácia jazyka a predmetu so sebou prináša problémy týkajúce sa tak spracúvania a učenia sa informácií v cudzom jazyku, ako aj zvýšených nárokov na žiakov, ktorí sa musia vyrovnávať so simultánnym učením sa jazyka a obsahu.

Medzi žiakmi učiacimi sa cudzí jazyk existujú výrazné rozdiely, ktoré sa prejavujú v učení ich druhého ale tak isto aj prvého jazyka. Pri posudzovaní rozdielov medzi žiakmi sa zvyčajne rozoznávajú tri typy faktorov: kognitívne, afektívne a sociálne. Táto diplomová práca sa zaoberá iba prvými dvoma typmi faktorov vo vzťahu ku CLIL. Práca sa snaží priniesť empirické poznatky týkajúce sa na jednej strane kognitívnych schopností žiakov a vplyvu, ktorý na ne má učenie sa v bilingválnom prostredí nastolenom v rámci CLIL. Na druhej strane sa práca sústredila na získanie poznatkov týkajúcich sa afektívnej, pocitovej oblasti fungovania CLIL, t.j. na preskúmanie reakcií žiakov na zvýšené nároky plynúce z tejto učebnej metódy. Preto aby mohli byť získané dáta z oboch oblastí, táto práca používa dve výskumné metódy: psycholingvistický experiment a dotazníkový prieskum. Oboje predstavujú kvantitatívne metódy, ktoré umožňujú štatistické spracovanie získaných dát.

Experiment

Experimentálny výskum sa snažil získať dôkazy o praktickom dopade bilingválneho učenia sa na výsledky žiakov. Napriek optimizmu mnohých jeho zástancov, ktorí sa zasadujú o presadeniu CLIL ako oficiálnej alternatívy k tradičným výukovým metódam, skutočné procesy podieľajúce sa na fungovaní tohto prístupu ostávajú stále nejasné. Dizajn experimentu kládol zvláštny dôraz na skúmanie povahy vedomostí získaných v určitom jazyku a schopnosť žiakov použiť tieto vedomosti v inom jazyku. Napriek tomu, že sa všeobecne predpokladá, že naučené informácie (vedomosti) sú jazykovo neutrálne a môžu byť použité rovnako efektívne v akomkoľvek jazyku, ktorý žiak ovláda dostatočne dobre, zdá sa, že tento názor neodpovedá skutočnosti.

Viacere psycholingvistické štúdie poskytli dôkazy o tom, že informácia naučená (uložená) v určitom jazyku ostáva aj naďalej spojená s týmto jazykom. Toto sa prejavuje v určitých problémoch pri pokuse vyvolať si alebo použiť túto informáciu v inom jazyku ako v jazyku v ktorom bola naučená. Tento jav môže mať silné implikácie pre povahu vedomostí žiakov učiacich sa v cudzom jazyku.

Experimentálna štúdia prevedená na 16 stredoškolských študentoch bilingválneho gymnázia, čiastočne potvrdila tento predpoklad. V súlade s výsledkami predchádzajúcich skúmaní, výsledky z tohto experimentu potvrdili, že učenie a použitie presných faktov je závislé na určitom jazyku (či už je tento jazyk prvým alebo druhým jazykom žiaka). Toto značí, že vedomosti pozostávajúce z presných faktov nie sú v pamäti uložené v univerzálnom formáte, ktorý by bol rovnako prístupný skrz oba žiakove jazyky. Štúdia

presvedčivo demonštrovala, že hoci sa dve skupiny študentov učili úplne rovnaké fakty, ich schopnosť následne ich použiť bola sčasti závislá na tom, v ktorom jazyku sa ich učili (v slovenčine, ich prvom jazyku, alebo v angličtine, ich druhom jazyku) a tiež v ktorom jazyku mali s danými faktami pracovať (či v jazyku, v ktorom sa tieto fakty učili, alebo v jazyku, ktorý nebol použitý pri tréningu vedomostí).

Matematické úlohy, ktoré sa študenti v rámci experimentu učili, vyžadovali iba minimum jazykových znalostí (t. j. slovnej zásoby, gramatických vedomostí, atď.) a navyše boli silno repetatívne. Napriek tomu študenti, ktorí boli trénovaní v angličtine, reagovali podstatne pomalšie ako študenti, ktorí pracovali výhradne v svojom prvom jazyku (t. j. boli trénovaní a skúšaní na materiáli v slovenčine). Na druhej strane, týmto študentom pôsobilo problémy použiť ich vedomosti matematických faktov v angličtine, ich druhom jazyku. Tieto výsledky dokazujú, ovládanie daného jazyka na istej úrovni nie je zárukou, že študent je pripravený použiť ho v akejkoľvek jazykovej oblasti, a dokonca učiť sa v tomto jazyku. Zdá sa, že namiesto toho, aby cudzí jazyk bol médiom učenia sa a používania informácií, za istých podmienok (napr. pri zmene jazyka výuky) môže procesu učenia sa brániť.

Tieto výsledky naznačujú, že zavádzanie CLIL do škôl vyžaduje pozornú prípravu a plánovanie. Ak CLIL ako metóda jazykovej výuky nie je zavádzaná konzistentne a systematicky (napr. predmety učené v cudzom jazyku sú vybrané náhodne, žiaci majú jeden rok predmet v svojom rodnom jazyku a nasledujúci rok v cudzom jazyku, atď.), žiaci môžu byť opakovane vystavení zvýšeným požiadavkám tak na ich kognitívne schopnosti ako aj na ich učebnú prípravu. Nesystematické vzdelávanie pomocou CLIL

môže tiež vyústiť vo veľmi nevyvážené jazykové schopnosti žiakov, kde v niektorých jazykových oblastiach bude prevažovať jazyková kompetencia v ich prvom jazyku a v niektorých naopak bude dominantný ich druhý jazyk. Tieto javy môžu byť sprevádzané silnou frustráciou pri pokusoch žiaka prepínať medzi jazykmi podľa potrieb daného predmetu, ktorá môže ovplyvniť žiakov postoj k učeniu (napr. prispieť k zníženiu motivácie a úsilia). Všetky tieto javy sa môžu následne negatívne prejavíť na žiakových výsledkoch tak v štúdiu cudzieho jazyka ako aj v získavaní vedomostí z odborného predmetu.

Významnou oblasťou, ktorej sa výsledky tejto štúdie tiež dotýkajú, je hodnotenie žiakov v vo vyučovacom procese. Prepojenie jazyka a predmetu sa nutne musí odraziť aj na žiakovom výkone. Hoci niektorí učitelia tvrdia, že sú schopní v testoch a skúškach, ktoré pripravujú, zohľadniť úroveň žiakovho cudzieho jazyka, štúdia poukázala na to, že jazyk a vedomosti môžu byť prepojené na hlbšej úrovni, ktorá je len ťažko uchopiteľná. Tieto faktory by mali byť zohľadnené pri testovaní žiakov, ktorých výuka zahŕňa predmety vyučované metódou CLIL. Výsledky týchto žiakov by nemali byť porovnávané s výsledkami žiakov, ktorých výuka prebiehala v ich prvom jazyku. Napriek tomu, že škola môže interne zohľadňovať špecifické charakteristiky týchto žiakov, je otázne, či fakt, že žiakove vedomosti boli nadobudnuté v cudzom jazyku môže hrať rolu aj po tom, ako tento žiak opustí školu. Interakcia jazyka nadobúdania vedomostí a jazyka, v ktorom sú testované by mala byť ďalej študovaná aj v súvislosti s praktickými záležitosťami ako je ovplyvnenie žiakovho výkonu pri prijímacích skúškach na strednú alebo vysokú školu a

v podobných závažných životných situáciách, kde zdanlivé rozdiely vo vedomostiach priamo ovplyvňujú žiakov ďalší rozvoj.

Výsledky štúdie potvrdili význam ďalšieho skúmania kognitívnych schopností v súvislosti s učením sa v cudzom jazyku. Cieľom štúdie nebolo obhajovať CLIL alebo poukazovať na možné negatívne aspekty tejto metódy. Naopak, štúdia sa pokúšala zdôrazniť oblasti, ktoré si vyžadujú ďalšiu pozornosť pedagógov a didaktikov, ktorá prispeje k tomu, aby CLIL mohol byť úspešne využívaný.

Dotazníkové šetrenie

Dotazníkové šetrenie sa sústredilo na skúmanie afektívnych faktorov vo vyučovacom procese ako sú presvedčenia a názory žiakov alebo úzkosť spojená s učením. Tieto dva faktory boli skúmané v súvislosti s integrovaným učením jazyka a odborného predmetu. Experimentálna štúdia kladla dôraz na kognitívne schopnosti ako významný prediktor úspechu v učení. Bolo by však chybou hľadať rozdiely vo výkonoch žiakov iba v kognitívnych mechanizmoch. Jazyk, jeho používanie a učenie sa neexistuje v socio-psychologickom vákuu (de Bot, 2000: 229). Ako už bolo povedané, zavedenie CLIL znamená aj zvýšenie kognitívnej a pracovnej záťaže študentov. Zatiaľ nebolo presvedčivo dokázané, či sú študenti naozaj schopní prekonať tieto vyššie nároky vďaka zvýšenej motivácii a úsiliu, ako to predpokladajú teoretici podporujúci CLIL.

Štúdia odhalila, že presvedčenia a názory žiakov týkajúce sa výuky v cudzom jazyku boli v niektorých oblastiach prekvapivo negatívne. Zdá sa, že študenti s reálnou skúsenosťou s CLIL nezdediajú optimizmus jazykových pedagógov ohľadom výhod tejto

metódy. Rozdielne vnímanie predností metódy CLIL môže byť spôsobené tým, že žiaci nezdieľajú hlbšie pochopenie fungovania a účelu integrovaného učenia jazyka a predmetu. Žiaci len nepresne a intuitívne chápu význam CLIL pre ich jazykový pokrok. Tento pokrok je z ich strany pravdepodobne stále posudzovaný a meraný skrz ľahko kvantifikovateľné ukazovatele používané v tradičnejších metódach (napríklad počet slovíčok alebo gramatických chýb a pod.). Nemôžeme však viniť žiakov z toho, že nevnímajú a následne nevedia oceniť význam pragmatickej a sociolingvistickej roviny pre úspešnú komunikáciu v cudzom jazyku, keď na ne v rámci výuky neboli upozornení. Explicitná formulácia cieľov a výsledkov, ktoré sa dajú očakávať pri výuke v cudzom jazyku je zásadná pre úspech programov ako CLIL, ktoré nemajú takú tradíciu (v svojej modernejšej forme) ako napr. tradičné prekladové metódy. Oboznámenie sa s cieľmi a následné lepšie pochopenie učebného procesu, v ktorom sa nachádza, umožnia študentovi pochopiť povahu svojich výsledkov (úspechov) a v tomto zmysle mu aj dovoľia lepšie sledovať svoj postup (zlepšenie sa) v učení. Pochopenie cieľov môže posilniť žiakovu motiváciu a tiež posilniť jeho úsilie pri ich dosahovaní. Práve motivácia je nezanedbateľným faktorom pri dosahovaní úspechu v učení sa v cudzom jazyku, keďže je nutná na prekonanie zvýšených nárokov, ktoré sprevádzajú predmety v CLIL. Napriek tomu, formulácia cieľov dnes pri výuke s použitím CLIL chýba. Žiaci preto stále vnímajú predmety v cudzom jazyku buď ako obdobu jazykových kurzov, alebo ako odborné predmety.

Z toho možno vyplýva aj do istej miery ich obmedzená schopnosť stotožniť sa s cieľmi CLIL, ktoré zdôrazňujú tak učenie sa jazyka ako aj odborného predmetu. Reakcie

žiakov prezrádzajú, že ciele tohto predmetu vnímajú skôr v zmysle vedomostí z odborného predmetu ako v zmysle jazykových kompetencií. Podľa kritéria štandardného odborného predmetu následne posudzujú aj kvalitu tohto predmetu učeného v cudzom jazyku, ktorá je často vnímaná skrz množstvo materiálu prebraného. Odpovede respondentov naznačujú istú mieru nespokojnosti s obmedzeným rozsahom predmetu vyučovaného v cudzom jazyku. Hoci obsah predmetu môže byť obmedzený kvôli jazykovým cieľom, záleží sčasti na pedagógoch a didaktikoch, či tento fakt bude naďalej interpretovaný žiakmi negatívne. Možno upozornenie žiaka na jeho pokroky v jazykovej oblasti by zvýšilo aj jeho uspokojenie s predmetom.

Štúdia sa ďalej zaoberala prítomnosťou úzkosti a nervozity spôsobených nutnosťou verejne sa vyjadrovať v jazyku, v ktorom sú schopnosti študenta ešte obmedzené. Nervozita odhalená v štúdiu naznačila silné prepojenie medzi pociťovaným stresom a skúškami. Toto spojenie nie je neočakávané, ale napriek tomu si zaslúži ďalšiu pozornosť. Predchádzajúce štúdie poukázali na cyklický vzťah medzi úzkosťou a žiakovým výkonom, pričom úzkosť negatívne ovplyvňuje žiakov výkon a výsledky, a tieto zase zvyšujú žiakovu úzkosť z ďalšieho skúšania (MacIntyre, 1995). Problematickým sa tak stáva najmä hodnotenie žiakovho výkonu na hodine. Žiaci, ktorí majú tendenciu viac úzkosti, sú tiež menej aktívni na vyučovaní. Táto pasivita môže byť nesprávne interpretovaná ako nedostatok vedomostí, nechť zapájať sa a pod.

V svojich odpovediach pätina žiakov uviedla, že takmer vždy alebo často pociťuje úzkosť v súvislosti so svojou angličtinou, a ďalších 20 percent uviedlo, že úzkosť pociťuje tak v polovici prípadov. Hoci tieto výsledky môžu byť do istej miery ovplyvnené

skupinovou dynamikou na hodine, tieto čísla naznačujú, že pocit úzkosti spojený so žiakovým výkonom v angličtine je bežným pocitom v predmete učenom v cudzom jazyku. Tieto zistenia naznačujú potrebu ďalšieho skúmania tohto javu, ktoré by viedlo k vyvinutiu techník na lepšie zvládanie žiakovej úzkosti pri hodine.

Použitie prostriedkov, ktoré by umožnili identifikovať zdroje správania žiakov a prípadne ich prepojenia s ich názormi či postojmi (napr. dotazníkové šetrenia, riadené rozhovory, vedenie denníkov atď.), žiaľ, ešte nie je súčasťou bežnej učebnej praxe.

Záver

Obe empirické štúdie priniesli určité zaujímavé zistenia, ktoré sa týkajú praxe výuky odborných predmetov v cudzom jazyku. Zvlášť zdôraznená bola oblasť hodnotenia výkonu žiakov vzdelávaných v dvoch jazykoch. Vo vzťahu k nej experimentálna štúdia naznačila možné odlišné kognitívne spracúvavanie informácií na základe toho v akom jazyku boli naučené. Dotazníkové šetrenie poukázalo na prepojenie medzi správaním žiaka a úzkosťou spojenou s nutnosťou používať nedokonale zvládnutý cudzí jazyk. Šetrenie tiež varovalo pred možnou chybnou interpeláciou signálov vysielaných úzkostlivým žiakom.

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Appendix A

TERMS RELATED TO CONTENT-BASED INSTRUCTION

(from <http://www.content-english.org/>)

Content-based Instruction (CBI)
Content-based Language Instruction (CLII) *
Content-based Language Teaching (CBLT) *
Integration of Content and Language (content & language, ICL)
Content and Language Integrated Learning (CLIL)
Content and Language Integrated Classrooms (CLIC)
English-enriched Content Teaching *
Content-enriched English Teaching *
English-focused Content Teaching *
Content-focused English Teaching *
Content-centered English Teaching *
English-centered Content Teaching *
Content-driven English Teaching *
English-driven Content Teaching *
English-sensitive Content Teaching *
Content-sensitive English Teaching *
Content-oriented Language Learning *
Content-infused Language Teaching *
Theme-based Language Teaching *
Topic-based Language Teaching *
Discipline-based ESL Instruction *
Sheltered Subject Matter Teaching *
Teaching Content Through English
Teaching English Through Content
Foreign Language Medium Instruction (FLMI) / Foreign Language Mediated Learning
Teaching Through English (TTE) / Teaching Through Foreign Languages (TTFL)
Teaching Content in a Foreign Language (TCFL)
Dual-focused Language Instruction
Content-support ELT
Adjunct / Linked Language courses
Bilingual Integration of Languages and Disciplines (BILD)
Four-handed foreign language instruction *
Learning with Languages / Learning through an additional language
Immersion Foreign Language Immersion Program (FLIP)
Plurilingual Instruction
English Across the Curriculum / Foreign Languages Across the Curriculum (FLAC)
Enhanced Second Language Learning / Extended Language Instruction *
Language-enhanced Content Instruction *
Integrated Curriculum
Bridge Program
Cross-Curricular Teaching *
Interdisciplinary Teaching *
Learning skills based ELT / ESP

** Nearly every instance of "teaching" can be replaced with "learning" or "instruction"*

Appendix B

Figure 1B SuperLab 4.0 window

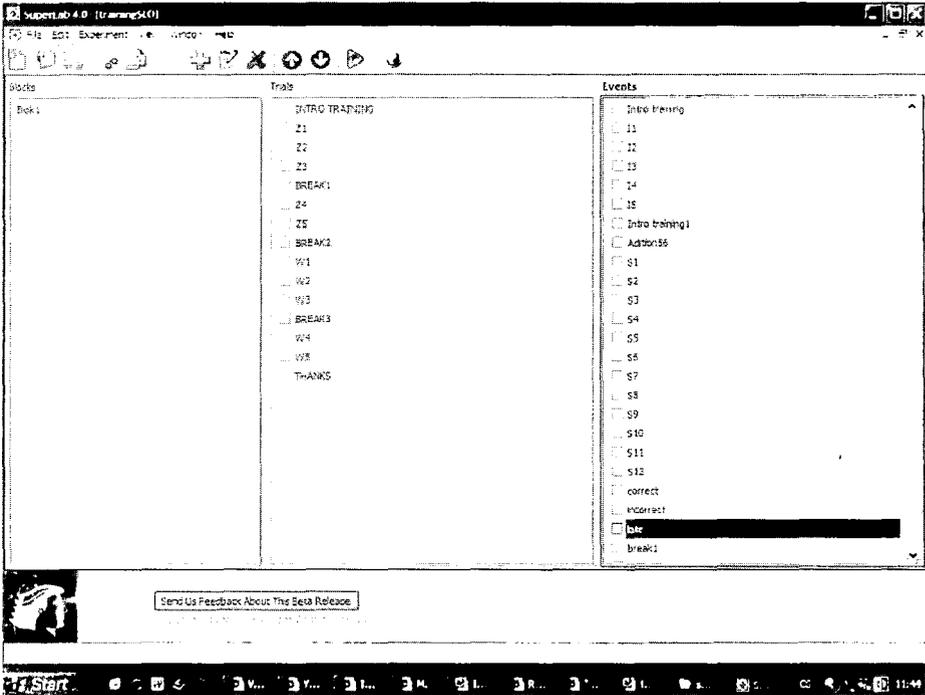


Figure 2B Problem displays in Slovak and English

<p>Koľko je šesťdesiat-štyri plus sedemdesiat-deväť?</p> <p>Sto-tridsať-tri Sto-štyridsať-tri</p>	<p>What is the sum of sixty-four and forty-three?</p> <p>One hundred seven One hundred seventeen</p>
--	---

Figure 3B Feedback displays in Slovak and English

Správne!	Nesprávne!	Čas vypršal!
Correct!	Incorrect!	Time over!

Appendix C

		Day 1												Day 2											
		English Test						Slovak test						English Test						Slovak test					
Participant	Gender	AoA	Training	TR56	TR64	Average	ST	UN	TR56	TR64	Average	ST	UN	TR56	TR64	Average	ST	UN	TR56	TR64	Average	ST	UN		
P1	F	12	E	3922	5341	4632	4497	6518	5246	5538	5392	4669	5375	3820	3668	3744	3300	4634	3849	3755	3802	3908	5771		
P2	M	12	E	7088	5917	6503	5858	8735	5726	6363	6045	7129	7827	4324	4342	4333	3862	4997	4383	3746	4064	3923	4912		
P3	F	12	E	5088	5510	5299	4798	7073	6097	5956	6027	5191	6607	3616	4027	3821	3789	4945	3754	4070	3912	3786	4529		
P4	F	5	E	5106	5128	5117	5127	5938	4644	3773	4208	4912	4894	3705	3306	3506	4324	4736	3718	4024	3871	3848	4539		
P5	M	8	E	4071	4571	4321	3721	4788	4166	3601	3884	3743	4774	2916	2976	2946	3204	3519	2985	3277	3131	3040	3522		
P6	F	15	E	4992	4995	4994	5140	5218	4688	4268	4478	4516	4406	3188	3297	3242	3139	3994	3514	3378	3446	3531	3941		
P7	M	11	E	7326	7180	7253	8729	8247	6319	6289	6304	6870	8006	3352	3281	3316	3521	4487	3362	3136	3249	3353	3445		
P8	F	15	E	4239	4926	4583	4976	6551	4361	4209	4285	4445	5819	3296	3452	3374	3814	3585	3133	3219	3176	3977	4124		
English Average				5229	5446	5338	5356	6633	5156	5000	5078	5184	5963	3527	3543	3535	3619	4362	3587	3576	3581	3671	4348		
P9	M	7	S	5842	4852	5347	5492	5378	4313	3877	4095	3653	5461	3373	3552	3462	3614	4592	2755	3123	2939	3922	3494		
P10	F	10	S	3817	3871	3844	3578	4016	3472	3310	3391	3526	4606	3609	3874	3742	3745	3826	2783	2991	2887	2612	3097		
P11	F	10	S	5489	5182	5336	5590	6546	5042	4025	4534	5163	5736	3924	4070	3997	3813	4303	3084	3051	3067	3710	4198		
P12	F	13	S	4829	3858	4343	4610	4713	3666	3632	3649	4368	5388	3248	3117	3182	3588	3394	3061	2734	2897	3333	3182		
P13	F	6	S	4189	3985	4087	3859	5893	3634	3540	3587	4147	5800	3972	4131	4051	3919	4566	2937	4018	3477	3484	3994		
P14	M	7	S	3824	3620	3722	3945	4534	3839	3460	3649	3896	4843	3239	3134	3186	2911	3909	3037	3020	3029	3216	3632		
P15	F	11	S	5982	4232	5107	4719	7871	4291	3885	4088	5032	7194	3727	3438	3583	4057	5766	3162	2390	2776	2847	5338		
P16	F	10	S	8086	5406	6746	5441	8173	4882	4462	4672	5495	5909	5433	4652	5043	4580	5543	3434	3356	3395	4022	4750		
Slovak Average				5257	4376	4816	4654	5890	4142	3774	3958	4410	5617	3816	3746	3781	3778	4487	3032	3085	3058	3393	3960		
Average total				5243	4911	5077	5005	6262	4649	4387	4518	4797	5790	3671	3645	3658	3699	4425	3309	3330	3320	3532	4154		

Notation AoA The age of acquisition of English
 S Slovak
 E English
 TR 56 Trained problems - addition with 56
 TR 64 Trained problems - addition with 64
 Average Average RT for TR 56 and TR 64
 ST Semi-trained problems
 UN Untrained problems
 The data are reported in milliseconds.

DOTAZNÍK

Časť A						
Vek:	Trieda:					
Pohlavie: M Ž	Predmet(y) v AJ:					
Známka z AJ:	Známka z predmetu:					
Časť B						
1. Angličtinu som sa začal/a učiť vo vekurokov.						
2. Svoju celkovú úroveň by som ohodnotil/a ako (zakrúžkuj):						
začiatočník	mierne	stredne	pokročilý	veľmi		
	pokročilý	pokročilý		pokročilý		
3. Svoje jednotlivé schopnosti by som ohodnotil školskou známkou (1-5):						
čítanie.....	písanie.....	hovorenie.....	počúvanie.....			
4. Som v kontakte s angličtinou aj mimo školu (knihy, rádio, filmy atď.)		1	2	3	4	5
Časť C						
I. Predmet v angličtine						
5. Pre učiteľa/učiteľku je angličtina rodný / cudzí jazyk. (podčiarkni)						
6. Plánujem z tohto predmetu maturovať.	Áno	Nie				
7. Tento predmet ma baví.	1	2	3	4	5	
8. Páči sa mi ako učiteľ/učiteľka učí tento predmet.	1	2	3	4	5	
9. Tento predmet by som mal radšej v slovenčine.	1	2	3	4	5	
II. Študijné stratégie v tomto predmete						
10. Pokúšam sa v angličtine o predmete premýšľať.	1	2	3	4	5	
11. Robím si v angličtine poznámky.	1	2	3	4	5	
12. Ak si o predmete získavam ďalšie informácie, tieto sú v angličtine (napr. čítaním, na internete, atď.)	1	2	3	4	5	
13. Pokúšam sa porozumieť tomu čo počujem/prečítam bez toho, aby som si všetko prekladal/a do svojho rodného jazyka.	1	2	3	4	5	
14. Keď sa pripravujem na hodinu (na skúšku, na test), učím sa rovnakým spôsobom ako na podobné hodiny v slovenčine.	1	2	3	4	5	
15. Na predmet sa pripravujem aj po jazykovej stránke (napr. musím sa učiť slovíčka, zlepšovať si gramatiku v určitých oblastiach, atď.).	1	2	3	4	5	
16. Príprava na predmet mi zaberá viac času, pretože je v angličtine (t.j. keby bol tento predmet v slovenčine, príprava by mi zaberala menej času.)	1	2	3	4	5	

17. Akým spôsobom sa učíš na tento predmet alebo na test/skúšku v tomto predmete? (učím sa naspamäť, kreslím si vzťahy, čítam si poznámky, atď.)

III. Na hodine....

18. So spolužiakmi sa rozprávam v slovenčine/ v angličtine/ striedam oba jazyky (podčiarkni).

19. S učiteľom/učiteľkou komunikujem v slovenčine/ v angličtine/ striedam oba jazyky (podčiarkni).

20. Na hodine si robím poznámky v angličtine. 1 2 3 4 5

21. Ak hovorím, a neviem si spomenúť na správny výraz v cudzom jazyku, použijem gestá alebo na chvíľu prepnem do svojho rodného jazyka. 1 2 3 4 5

22. Na hodine mám dosť príležitostí komunikovať v angličtine. 1 2 3 4 5

23. Keď mám niečo povedať, hanbím sa za svoju angličtinu. 1 2 3 4 5

24. Mám problém sformulovať svoje myšlienky v angličtine. 1 2 3 4 5

25. Na tejto hodine som rovnako aktívny/a ako na iných hodinách. 1 2 3 4 5

26. Cítim nervozitu, keď sa mám na hodine vyjadriť po anglicky. 1 2 3 4 5

IV. Skúšanie a tvoje výsledky

27. Radšej by som bol testovaný/á (skúšaný/á) v slovenčine. 1 2 3 4 5

28. Vyhovuje mi mať testy (skúšky) v angličtine. 1 2 3 4 5

29. Mám pocit, že pri skúšaní najviac zavážia moje vedomosti z predmetu. 1 2 3 4 5

30. Mám pocit, že moju známku na tomto predmete ovplyvňuje moja úroveň angličtiny. 1 2 3 4 5

31. Keby som bol testovaný/á v slovenčine, moje výsledky by boli lepšie. 1 2 3 4 5

32. Keby som bol testovaný/á v slovenčine, menej by som sa bál/a testov. 1 2 3 4 5

33. V predmete pociťujem problémy s angličtinou v oblasti (ohodnot' známkami 1,2,3,4, kde 1 znamená takmer žiadne ťažkosti, 4 znamená najväčšie ťažkosti):
hovorenie.....čítanie.....písanie.....počúvanie.....

V. Dosiahnutý pokrok

34. Tento predmet mi pomáha celkovo sa zlepšiť v angličtine. 1 2 3 4 5

35. Moje vedomosti by boli lepšie, keby sa tento predmet vyučoval po slovensky. 1 2 3 4 5

36. Zlepšil/a som sa najmä v jazyku. 1 2 3 4 5

37. Zlepšil/a som sa najmä vo vedomostiach z predmetu. 1 2 3 4 5

38. Domnievam sa, že keby bol predmet v slovenčine, prebrali by sme viac. 1 2 3 4 5