Content and Language Integrated Learning at Technical University

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ABSTRACT: *Specialists can survive and become competitive on the global labor market if they are not restricted by language barriers in their worldwide search of employment. The demand for the technical Universities graduates with a profound technical education and good command of English is outstripping supply. It encouraged language and non -language professors of our University to implement content and language integrated learning (CLIL) in the technical university classrooms, that is teach different subjects in English. This educational model became a break through traditional language lessons which seldom bring to high level of academic language proficiency. One of the undisputable advantages of such educational mo del is that substantial contact time with a target language is provided. Another, much more important advantage of subject -language integration is the use language for meaningful educational and professional activities, when language knowledge is effective ly being turned into language skills. And, of course, there is no better way to accurately understand and master subject -specific language and core terminology than by means of CLIL model. Different forms of CLIL education were being practiced at our Unive rsity for more than ten years. During all these years the number of students willing to plunge into education conducted in English exceeded opportunities provided by the University faculties. English as a teaching language was chosen on the grounds that it is a dominant "lingua franca" type of a language and that the required number and complete set of non -language teachers who are able to cover Bachelor's Degree curriculum was available only in English and only for such majors as "Electrical Engineering", "Material Sciences" and "Metallurgy". A number of restraining factors such as teacher availability and assessment, interconnection between language and subject -matter classes, textbooks and learning materials provision, curriculum adjustment, exit assessme nt criteria, certification, etc. prevent rapid spread of CLIL models in University. The requirement which all non -language professors have to meet is a good command of common and scientific (subject -specific) English. To ensure proper language level of the CLIL textbooks non -language authors collaborate closely with University language teachers and invited native non -language teachers. Language lessons for students involved in CLIL project are increased to 8 hours per week. These lessons are vital for accur acy of language usage and language understanding, for at CLIL lessons English is used 'as a tool' and not 'as a subject -matter'. Such language -centered approach at English lessons combined with practicing language skills at non-language lessons is a part a nd parcel of CLIL educational model. A diverse variation of CLIL is experienced by students of Economic majors. The third variety of*

CLIL education is being implemented recently for the students who are trained to become technical translators. The gained e xperience proves that CLIL models may be implemented as an alternative to expensive immersion models of language training abroad

The value of multilingual skills in a modern world which is gradually turning into an indivisible global village is hard to overestimate. It is proving ever more difficult to keep within confines of one language in travel, recreation, information, employment. As mobility, both virtual and physical, has increased, communication channels from face-to-face to e-mail have become increasingly important. Much communication requires the ability to use language in both oral and written form effectively. Specialists can survive and become competitive on the global labor market if they are not restricted by language barriers in their worldwide search of employment. The demand for the technical Universities graduates with a profound technical education and good command of English is outstripping supply. It encouraged language and non-language professors of our University to implement across the curriculum model of content and language integrated learning (CLIL) in the technical university classrooms, that is teaching all the mainstream subjects in English **(**Crandell : 1994**)**. The integration of language and subject-matter instruction is no longer a new trend in ESP methodology. A collaboration of the subject specialist with the language tutor while teaching self-contained courses is supposed to be "ideal" for students' progress (Davis : 1997). This model of language acquisition became a break through traditional language lessons which seldom bring to high level of language proficiency. One of the undisputable advantages of such educational model is that substantial contact time with a target language is provided. Another, much more important advantage of subject-language integration is the need to use language for meaningfully educational and professional activities, and in such conditions language knowledge is effectively being turned into language skills. Different forms of CLIL education were being practiced at our University for more than ten years and proved to be promising and attractive teaching technology.

The idea to teach through English got a quick response from the students and their parents. During all these years the number of students willing to plunge into education conducted in English exceeded opportunities provided by the University faculties in integrated education. English as a teaching language was chosen on the grounds that, on the one hand, it is believed to be a dominant "lingua franca" type language, and on the other hand, the required number and complete set of non-language teachers who would enable students to acquire Bachelor's Degree appeared to be available only in English and only for such majors as "Electrical Engineering", "Material Sciences" and "Metallurgy". A number of restraining factors such as teacher availability and assessment, interconnection between language and subject-matter classes, textbooks and learning materials provision, curriculum adjustment, exit assessment criteria, certification, etc. prevent rapid spread and evolution of CLIL educational model in University classrooms for different types of students groups.

A team of appropriate committed teaching staff was chosen for the CLIL project. The requirement which all non-language professors had to meet was a good

command of common and scientific (subject-specific) English. The experience of teaching subjects in English abroad and for non-residents of Ukraine was also taken into account while selecting non-language native professors. To further improve language proficiency of those participating in CLIL project language teachers from the USA were invited. For two years they had been conducting daily classes for both language and non-language teachers and upon the graduation of these language courses all attendees had to pass a final examination. Those attendees who demonstrated good results at the final exam and outstanding progress compared to their language level at the beginning of language courses were granted a certificate of language acquisition. The other requirement obligatory for all non-language CLIL teachers was getting an approval and high estimation by University language and non-language teachers of their lecture and seminar conducted in public. Upon completion of these requirements non-language teachers were officially permitted to teach in CLIL classes.

Although at the beginning of the project non-language teachers were ready to introduce and put into practice CLIL educational model just for the sake of it because they were excited by the very idea and took it as a personal challenge, later on University authorities became very supportive in implementing CLIL, though the proposed form of education was a complete break away from the highly centralized, tightly controlled monolingual education universally accepted in the country. The curriculum hours allocated for CLIL classes are doubled when non-language teachers loading is calculated. University administration gives priority to publication of CLIL manuals, textbooks, teaching aids materials, subject-specific vocabularies with comments on the “false friends” terms, etc. over the rest of teaching materials in the University printing and publishing center. Thus during a decade a significant amount of teaching materials has been accumulated. The authors are given an incentive to develop new disciplines in English and create new teaching materials by raising their monthly salaries. To ensure high language level of the CLIL textbooks non-language authors collaborate closely with University language teachers and native non-language teachers who work as invited professors.

The language lessons for technical students involved in CLIL project are increased to 8 hours per week (compare to 3 hours per week in a conventional group of technical students). These lessons are vital for accuracy of language knowledge and language understanding, more so, for even though at CLIL classes no other language but English is found, English is used ‘as a tool’ and not ‘as a subject-matter’. The aim of English teacher is to help students in mastering pronunciation, reinforcing vocabulary, gaining grammar proficiency. Such language-centered approach at English lessons combined with practicing language skills at non-language lessons is a part and parcel of CLIL educational model.

In this connection it is useful to differentiate learners’ competence, i.e. what they are able to do, and learners’ performance, i.e. what they actually do. Piet Van de Craen speaks about transfer from ”declarative to procedural knowledge” as “move from factual *knowledge* to automatised *doing*.” (CRAEN P.V.de :) The interaction of competence and performance results in language proficiency. Language competence isn’t built exclusively of vocabulary and grammar, but of knowledge of

discourse, or how language is organized to present necessary information in a certain communicative situation. Students should learn to identify communicative situation and coordinate given in it information within the limits of the full speech environment, context of the situation. Thus, communicative competence incorporates grammatical competence and ability to cover discourse. We can hardly expect students to pass all the way from language knowledge to language skills, from language competence to language proficiency without assistance of English teacher (Shah : 2003).

The way people use language is different from the way people learn it. CLIL draws students into a truly communicative setting, where their language competence adapts itself to informational needs of a certain situation, linguistically and extra-linguistically. Each learner participates and interacts to the fullest in the target language and gains communicative proficiency. The viewpoint expressed in the statement "Tell me, and I forget. Show me, and I understand. Involve me, and I remember" holds true. And, of course, there is no better way to accurately understand and master subject-specific language and core terminology than by means of CLIL model. The researchers insist that when it concerns language proficiency it is useful to differentiate basic interpersonal conversational skills (BICS) necessary for face-to-face conversation in social settings and cognitive academic language proficiency (CALP) (Cummins : 1980). And they prove that it takes much longer for students to read and comprehend content area textbooks and perform cognitively demanding tasks, such as writing research papers, participating in debates, and presenting research papers than to communicate in cognitively undemanding contexts. Thus, CALP is a long-term undertaking (Brown : 2004).

As long as the students of CLIL groups are selected as best among other willing students their academic achievements and professional expertise upon graduation are rather high and they compose an elite part of student body. The indirect evidence of this fact is that they all are given a full guarantee contract of employment upon graduation on the industrial enterprises of our city since they are on their first year of studies at the University. The case in itself is quite unprecedented for today.

A somewhat diverse variation of CLIL is experienced by students of International Economic Relations, Management and Marketing majors. The students of these majors traditionally have higher initial language level than technical students, because they are enlisted to the University only if they successfully pass an entrance examination in English. According to a curriculum an amount of language lessons per week in groups of economy students is similar to that of CLIL technical groups, but a shortage of non-language (non-native) teachers able to teach their subjects in English does not permit to implement a full-fledged, across the curriculum CLIL model. Fortunately there is a tradition to invite native non-language teachers to the economic faculty for reading a number of obligatory economic disciplines included into curriculum. The majority of students are excited to have an additional opportunity to train their Business and Economic English at the classes taught by native non-language professors in authentic English language. There is no need to say that such CLIL classes prove to be very useful for the students and improve their

language skills greatly. At the same time we may assert that the language proficiency and mastering of subject-specific language and core terminology by technical students which get a comprehensive full-fledged CLIL training performed by non-native non-language teachers is higher in the average than that of economists who enjoy only partial CLIC training, even though it is performed by native non-language teachers. It seems that high exposure to language in the case of complete across the curriculum CLIL variety performed by non-language non-native teachers outdoes partial variety of CLIL performed by native non-language teachers.

The third variety of CLIL education is being implemented recently for the students who are trained to become technical translators. They are getting thorough and comprehensive linguistic education and language training, traditional humanitarian and linguistic education. At the same time we are deeply convinced that a professional technical translator should combine a good command of source and target languages with more or less intimate acquaintance and understanding of the basics of fundamental and engineering sciences taught at technical universities. Making up a syllabus for future translators we included such subjects as chemistry, mathematics, physics, computing, electrical engineering, materials sciences, applied mechanics, metals processing, economics, hydraulics and thermal dynamics, aircraft engines. These subjects were not chosen at random, the choice was determined by spheres of scientific and technical interests of presumable employers. The emphasis is on the development of language skills in both source and target languages based on accurate and precise understanding of basic notions and core terminology in each discipline, creation of stable inter-linguistic equivalents, and ability to make adequate translation decisions. The CLIL approach helps translators to simultaneously process and keep in the memory verbal and precision (expressed in digits, numbers and measuring units) information, which coexists in a majority of technical oral and written texts and which traditionally causes difficulties in translation. The stress is made also on the “false friends” of a technical translator, trap words, technical neologisms, terminological word-combinations and word-indicators, measuring units and measuring systems, etc. Language and non-language teachers are recently preparing textbooks in source and target languages, teaching aids and vocabularies. In CLIL teaching the focus is on the verbal ways of expressing scientific and technical notions and phenomena in both languages. Actually we are now searching for the most efficient ratio between language and content in CLIL learning and new effective methods of teaching technical subjects to non-engineers. But there has never been a tinge of a doubt as to expediency and validity of integrating CLIL engineering education into a broad comprehensive training of technical translators as a necessary prerequisite of educating highly qualified technical translators.

The experience of ten years application of various CLIL models in Zaporizhzhya National Technical University gives grounds to assert that these education models are exciting, highly efficient programs of language training which may be implemented here in Ukraine. Students are provided with opportunity to acquire high standard education not leaving the country and spending huge sums of money. There are sound reasons to view CLIL as an alternative to expensive immersion models of language training abroad.

The description of CLIL education models may be of interest for language teachers, learners, administrators and educational decision-makers.

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