Tertiary Education via CLIL in Engineering and Management

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Abstract: CLIL stands for Content and Language Integrated Learning and, as defined by Marsh, refers to the dual-focused educational contexts where an additional language is used as means in the study of non-language content. It derives from the concept of language across the curriculum, according to which successful idiom learning occurs as students have the opportunity to get instruction and experience real-life situations, thus acquiring the idiom simultaneously. Language is the instrument, not the end, and students interested in the topic are motivated to absorb language in order to communicate. Today’s students learn best and most when they create, prioritise, discover and construct their own meanings actively, in real or e-settings.

Key-Words: CLIL in university, tertiary education in management and engineering, English communication in teamwork, B2-C1-C2/CEFR idiom proficiency, specialised content competence, EU job market requirements

1 Introduction

Both language acquisition and discourse analysis in content subjects are fields of linguistics with strong traditions&history. Engineering, business, medicine, agronomy and law constitute areas with their own specialized approaches in delivering language for specific topics. Professors’ concern is successfully implementing discourse analysis techniques to all education levels, in view of identifying curricula language accessible to all learners working in a second idiom. There has been constant pressure exerted by different factors and events generating change in this domain over the last quarter of a century, as visible in the diagram below.

Study types include formal (organized, intentional, structured), non-formal (no credits, but organized), as well as informal learning (spontaneous, lacking organization). In them all, each subject has its own set of skills, some specific and some common across subjects. For example, research requires sub-skills for data processing (collection, prioritising, essay writing) alongside with presenting data to a group. Hence the specific language demands the teacher will identify, practise, and support for the learner to become able to acquire the language proficiently. In this respect, the Digital Era radically changed both learning and teaching skills & approaches, as visible in the next parallel to Bloom’s taxonomy:

Fig. 1 1990-2000 Pressure for change, eurydice.org 2014

Fig. 2 Bloom’s revised taxonomy versus contemporary issues
ESP (English for Specific Purposes) used in subjects across the curriculum is a general academic idiom, dedicated to no particular topic. In content classrooms there are 3 major linguistic flows: subject-specific, general academic and peripheral language. What CLIL offers to students of any age is a more suitable context for linguistic development which builds on other forms of learning. The natural communication boosts inner motivation towards getting the idiom and it generates CLIL success in relation to both language and subject study. Hence CLIL lessons exhibit the following characteristics:

- Integrate language and skills.
- Combine receptive and productive skills.
- Rely on reading and listening texts.
- Require note-taking abilities.
- Imply functional study by schemes.
- Lessons language is not structurally graded.
- Five-year bilingual program students are able to face the academic English proficiency standards in business engineering CLIL.
- Cyclic, recursive, and non-linear language study.
- Semantic fluency precedes grammatical accuracy.
- Errors are a natural part of language learning.
- English learners obtain fluency by communicating for a variety of purposes, in authentic interactions.
- Reading gets progress in academic language skills
- Courses favour higher order thinking skills while working on cross-curricular themes and projects

Various types of CLIL programs range from full immersion (Canada) to partial immersion, about 50% of the curriculum (Spain), to language showers and regular 20–30 minute subject lessons in the target language (Germany). In Romanian universities, subjects are often taught in the target language by non-native speakers of the subject or by language professors. Elsewhere, native speaker seminar assistants support the students. Moreover, native speakers may teach English to non-native learners (minority idiom groups) to facilitate their integration into mainstream classes (e.g. EAL—English as Additional Language/Britain, CBI—Content Based Instruction/US). The CLIL approach develops confident learners and enhances academic cognitive processes alongside with communication skills, favouring intercultural understanding and fostering community values. In addition, research shows that learners become more sensitive to vocabulary and ideas presented in their first language, as well as in the target language, and they gain more extensive and varied vocabulary.

CLIL induces more cognitive activity throughout the learning process.

2 CLIL specifics in tertiary education for management engineering

CLIL describes an evolving approach where subjects are taught & studied by a non-native language, which is more challenging and intensive, as there is more exposure to the language and the students acquire knowledge and skills in different areas of the curriculum. CLIL subjects include Agronomy, Business, Active Citizenship, Design Technology, Engineering, Environmental Studies, Geography, Information and Communication Technology (ICT), Literacy, Maths, Politics, Science, Social Science.

Fig 3 Thinking skills active in CLIL projects of cross-curricular nature, www.englishplus.com

3 Advantages and disadvantages in university CLIL

A pedagogical approach of multi-literacies must be flexibly implemented in order to allow alternative forms of engagement for different learners with divergent study skills. It is well suited for supporting university courses where language learning has to go beyond sets of grammar rules and vocabulary, and, instead includes as key ingredient the reflection on text as well as understanding of how texts and genres interact towards making meaning in context. The European Commission highlights CLIL benefits in building intercultural knowledge & understanding, developing communication skills, improving idiom competences, multilingual interests & attitudes, providing chances to see content in many perspectives, diversifying didactic methodology for both learner motivation and confidence in the idiom & topic.
Fig. 5 CLIL Benefits, Mehistro, *Uncovering CLIL*, 2008

Here follow the advantages:

- Lessons are based around topics and idea clusters;
- The focus is less on linguistic intelligence and more on fluency, meaning, communication practice;
- Chances to experiment & take risks with language;
- Students notice language slowly but naturally;
- Appeals to students’ real interests, aims, needs;
- Makes the most out of all resources in university;
- Teachers become facilitators and go-betweens;
- Thought-provoking content via multimedia;
- Innovative, appealing and motivating materials, contexts and techniques;
- Immediacy: topics activate and expand students’ knowledge to create opportunities for real dialogue here & now as opposed to practising for later use;
- Time effective: synthesis across the curriculum to better use the limited classroom time;
- Skills ready to use in education & work contexts;
- Improvement of self-esteem and self-reliance;
- Inter-cultural and cross-cultural awareness;
- Realistic goals and settings;
- Students are credited for extra skills & knowledge;
- Mobilising approach for life long learning;
- Students learn like native speakers;
- Extra-language knowledge as input;
- Sense-making interferes with social aspects;
- Convergence of self-study, advanced education, and working life on a flexible labour market.

Fig. 6 Working with the CLIL Pyramid, Meyer, 2010

Critical framing and analyzing results situates work in a context. Comments, critical discussion, and exchange of ideas must be supported by the learning environment. Hence project work is easier to embed into CLIL than into a conventional language classroom. The activity is a part of the entire information access process: information retrieval by searching and browsing, then analysis and synthesis of results. CLIL requires adjustment in methodology to ensure that students understand the content, so professors have to think of other ways (group work, tasks, debates & discussion) to actively involve learners while providing professors with additional possibilities for feedback on the language as well as the content to be taught. The main disadvantages are few:

- Language is not covered systematically;
- Insistence on *English only* might limit students’ cognitive ability and activities;
- Time consuming in inter-didactic collaboration;
- Exams grade content and language separately;
- Professors: uncomfortable teaching other subjects;
- Students learn like native speakers;
- Extra-language knowledge as input;
- Sense-making interferes with social aspects;
- Assigning group members’ roles: simultaneously search or asynchronously collaborate reusing results;
- There are no textbooks specific to CLIL courses;
- Foreign schools textbooks have different syllabus, mindsets & approaches, so they cannot be used;
- Transforming authentic input into skills teaching material: pictures/drawings/charts for understanding;
- Supplying students with a work schedule, topics, key words and concepts, and then enforcing it all;
- Revisit the lesson input in a cyclical manner;
- Explain abstract concepts by tangible examples.

4 The profile of the CLIL professor

The professor uses systematic but flexible methods to improve educational practices by analysis, design, development & implementation, relying on cooperation among researchers & practitioners in real-world settings. The methodology is pragmatic, conducted in actual settings, flexible, interactive (designers work together with participants), integrative (mixed
research methods are used, and modalities vary in different phases), and contextual (research results are connected with the design process & the setting). Therefore the CLIL professional will demonstrate certain indispensable traits:

- Widely read in literature and theory on CLIL;
- Flexibility and teamwork skills;
- Able to design CLIL work stages;
- Effective in class work;
- Capable of finding resources and materials;
- Skills in highlighting important items, going back to crucial points by rewording, rephrasing & giving new perspectives; skills in text markers role analysis (logical flow, time-sequencing, cause-effect links);
- Practical in monitoring and assessing the process, the product and the project, subsequently testing students’ gaps in content or language separately;
- Adaptable methodology and materials. Resources are reintroduced or recycled as new ones with proper metadata, helping contextualized sense-making;
- Assessment melted in work activities & exercises;

Fig. 7 CLIL Assessment Advantages, Mehisto, 2009

- Students do pair work or group work so that there is less lecturing on behalf of the teacher;
- Optimal education strategies are problem solving, content mapping, conceptual elaboration, practising communication skills, and manifesting attitudes;
- After each work session, students must summarize (by completing material, making a chart, etc.);
- Mistakes corrected only if they are impediments in understanding the message

5 CLIL facilitating independent study

A key aim of CLIL teaching is to help students work independently to solve problems and develop their own knowledge and skills. It is the most successful didactic learner autonomy instrument, consistent with the graduates’ life-long learning framework.

This approach closely connects with students’ lives, needs and interests, encouraging student-to-student communication, learning and decision-making on content and language, as well as on assessment criteria. In certain cases, student-generated rules are accepted, allowing them to ask for new input when they need it, as opposed to the teaching in advance of words that professors think learners might need.

We see consistent differences in aptitudes between monolingual & bilingual students. The former show greater competence in acquiring and memorising in-formation, while the latter tend to adopt analytical approaches to learning; they are more skilled in applying new knowledge to new contexts.

CLIL adds extrinsic motivation for males while female students show intrinsic motivation (Lasagabaster 2010). It may reduce the well-known gender differences in foreign language competences between males & females as seen in research studies in many contexts (females are more inclined to study foreign languages and they usually outperform males). However, CLIL does not eradicate gender gaps.
As not all students work in the same way, they are advised to recognise and develop their own learning styles and strategies. Instilling autonomy will result in better learning proved by the correlation between the learning pyramid and the core CLIL activators:

![Learning Pyramid](image)

**Fig. 10 Core CLIL activators, National Training Labs, Bethel, Maine, 2014**

CLIL differs from traditional education. Rather than focus on a single subject, it includes all the goals of the CLIL lesson, involving competences, knowledge, skills, attitudes and behaviour. Students’ particulars are taken into account in preparing CLIL curricula and assessment, so as to enhance independent study (Massler, 2011, p. 118):
- instruction duration;
- students’ age when starting the foreign idiom;
- consistent progress in content area & idiom skills;
- official education regulations;
- development of strategic competence;
- positive attitudes towards language and content.

At times priority shifts from content understanding to accurate language use. The following diagram conveys the complex ensemble of independent study strategies, providing a glimpse into the difficulty of teaching them in an integrated manner.

![Independent Learning Strategies Frames](image)

**Fig. 11 Independent Learning Strategies Frames, Macaro, 2012**

A grid, listing the criteria to be evaluated in form of rows, divided into columns for each mark, is useful in assessing a wider range of issues encompassing the independent learning, rather than focus on single aspects. If the same grid is used for several different tasks, or for evaluations series over a longer project, then it becomes relevant for showing progress, from poor to excellent work. Consequently, it is easy for students to see how to improve their work for the next test. According to the grid, they make decisions on worthy areas to focus effort on: if high marks are given for critical thinking, learners make sure that they are critical in their answer; if team work is one of the criteria, they make the effort to interact.

In this way, assessment increases learner autonomy by helping students acknowledge the aim of their learning and how to identify and fill any gaps. Learner autonomy is fostered by allowing students to suggest or even select criteria; self- & peer-assessment can motivate and encourage the reluctant ones.

### 6 Policy-Makers implementing CLIL

In CLIL, it is critical for policy makers to:
- Allow universities of all types to organise & deliver CLIL, tailored to their needs, and in a flexible way;
- Promote CLIL benefits to managers, leaders and to the authorities which fund them;
- Develop supportive national guidelines on CLIL implementation in the curriculum;
- Provide initial teacher training opportunities in a content subject while fostering idiom competences;
- Offer relevant continuing professional development for CLIL teachers in CLIL environments;
- Support staff to organise communities for sharing resources & methods for teaching CLIL effectively.

![Evaluating the impact of CLIL programs](image)

**Fig. 12 Evaluating the impact of CLIL programs, Coyle, Content and Language Integrated Learning, 2010**

### 7 Conclusion

There is strong evidence regarding the positive impact of CLIL on students’ language competences as compared to standard foreign language programs in different states over a long period. Some commentators say the impact scale stems from the selection
of participants, but the results identify benefits for all those involved. CLIL has no adverse impact on content learning outcomes in the subjects where it is used. CLIL affects language competences such as receptive skills (listening and reading), morphology (structure of language units), creativity and fluency. CLIL diminishes the impact of socio-cultural status and mobilises lower ability learners’ performance. They are more motivated towards independent study and self-confidence increases as they take risks and deal with ‘real issues’ at centre of their study. CLIL better cognitive development, cultural awareness and motivation to learn languages, without any significant detriment to content learning in the subjects where it is used. By possibly attracting more motivated learners, it may also trigger better results. Continuing professional development and life-long learning are facilitated by CLIL. Universities and authorities benefit from using the CLIL framework of competences. It requires development costs, not recurring costs to put in place. Expanding CLIL requires professors with higher levels of idiom competence in the language of instruction (at least B2), which might be a constraint for many states where idiom competences are not found among sufficient non-language teachers. CLIL needs flexibility in the didactic arrangements to meet curricular demands. Universities should be able to introduce CLIL for specific teaching groups as an option. Providing CLIL will create pathways for graduate students to make a successful transition to the labour market and build on the benefits of increased language competences.

References: