Measuring the effect of implementing CLIL in higher education: An experimental research project

Dora Chostelidou\textsuperscript{a} *, Eleni Griva\textsuperscript{b}

\textsuperscript{a}, Aristotle University of Thessaloniki, Thessaloniki, 54124, Greece
\textsuperscript{b}, University of Western Macedonia, Florina, 53100, Greece

Abstract

The aim of the present paper is to provide insights into experimental research on a CLIL project for reading skills development in the context of Greek tertiary education. The research design involved conducting interviews and administering a CLIL test with a focus on reading skills and the content of the target discipline. The data provided support for the efficacy of implementing CLIL in higher education as the experimental group outperformed the control group in terms of both reading skills and content knowledge and showed a considerably higher positive attitude towards the CLIL course than their peers in the control group.

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1. Introduction

Content and Language Integrated Learning (CLIL), a generic umbrella term for bilingual, content-based education has become a well established part of many educational systems across Europe (Wolff, 2007) in the course of the last two decades, which came about in result of the wide recognition of the fact that the provision of curriculum content in a second language (L2) can be advantageous in terms of enhancing both subject knowledge and L2 proficiency (Coonan, 2002; Wilkinson, 2004; Coyle, 2005; Stohler, 2006; Dalton-Puffer, 2007).

Many of the arguments in favour of CLIL are deeply rooted in SLA research. In particular, it is suggested that its implementation allows for: a) the creation of optimal conditions for naturalistic language learning; b) the provision of a clearly defined purpose for using the L2; c) the development of a positive effect for L2 learning focusing on meaning rather than form; and d) an increase in the amount of exposure to the target language (TL) (Dalton-Puffer, 2007; Dalton-Puffer & Schmit, 2007).

The rationale for the integration of content and language, which involves language instruction organized around non-linguistic topics and subject matter rather than strictly linguistic issues, can be identified in research evidence from Krashen (1982), Lightbown & Spada (2006), and Swain (2000); According to them, L2 can be more

* Corresponding Author Dora Chostelidou. Tel.: +030-6944148077
E-mail address: chostelidou@yahoo.com dchoste@enl.auth.gr
effectively acquired in conditions which resemble the acquisition of L1 and the focus of instruction is on meaning rather than form, the language input is in accordance with the learners’ level of competence, while opportunities for engaging in purposeful use of the TL in a student-friendly setting are provided. In this way, there is a shift in terms of the focus of language instruction as the students are provided with the every opportunity to engage in meaningful exposure and use of the TL through content instruction of their academic subject as part of CLIL (García, 2008; Naves, 2009). This way the TL not only becomes the medium of instruction but also of communication.

It should be noted that CLIL methodology includes: a) its multiple focus (on language, learning and cognition); b) the construction of safe and enriching learning environments; c) the use of authentic materials and interactions; d) the promotion of active learning; e) the use of macro- and micro- scaffolding in students’ learning so as to enhance their autonomy; and, f) the promotion of co-operation among students and teachers (Hammond, 2001).

The development of reading skills is considered highly important in CLIL (Wolff, 2005) not only for comprehension purposes but also given its implications for instruction of content and its integration with other skills. Developing good reading skills is an inherent part of the whole learning process in the TL however, CLIL in higher education facilitates access to subject-specific L2 terminology, which leads to easier comprehension of texts in the TL. This fact increases learners’ motivation and prepares them for future studies and work-related purposes.

Nevertheless, it should be noted that the more positive attitudes the students have towards the TL, the better they learn it while CLIL programmed are considered to be able to develop a more positive attitude towards it (Hartiala, 2000). In fact, they can nurture ‘a feel good attitude’ among the students according to Marsh (2000), as irrespective of how modest the proficiency level attained eventually is, it may positively affect the students’ desire to learn and develop their language competence.

2. The background to the study

2.1. The aim and objectives of the study

The present study attempted an exploration of the integration of CLIL in the language curriculum of Accountancy students in the context of Greek tertiary education through the implementation of an experimental syllabus and materials developed for the target group of students at issue. In particular, it aimed to investigate the impact of the experimental teaching intervention by measuring the outcomes of the implementation of CLIL in terms of the students’ performance concerning both language skills and subject-specific content of their target discipline. More specifically the study was conducted with the aim to test the following hypotheses:

1. CLIL promotes better performance in terms of developing both reading skills and mastering subject-specific content of the target discipline in L2.
2. CLIL instruction develops a more positive attitude towards learning English as a L2 compared to non-CLIL instruction.

The experimental research paradigm was employed with the aim to measure and evaluate the effectiveness of the adopted approach to reading skills development. The adopted experimental design involved a factorial experiment with two factors. One factor between subjects (Group, with 2 levels, experimental and control) and one factor within subjects with repeated measures (2 levels, Pre- and Post-).

2.2. The participants

The students involved in the experimental implementation of the CLIL were accountancy students (N=270) assigned in two research groups, the experimental (N=139) and the control group (N=131) on the basis of alphabetical order, an arrangement considered random enough to suit the research purposes of the present study. The distinguishing feature between the two groups was that the instructional context since the experimental group was presented with English as a vehicular language (CLIL) whereas the control group received teaching in English as a curricular subject (Non-CLIL). Also, the learners’ level of proficiency in English ranged from beginner (31%) to upper intermediate (59%) and advanced (9%) as measured by the OPT placement test at the beginning of the course.
2.3. The Research instruments

2.3.1. The CLIL test

In the case considered, a test instrument was developed as part of the experimental research project with the aim to measure the effect of the CLIL programme. The aim of the test, which was administered as a pre-and post-test, was to assess the learners’ performance in relation to content and language related to their academic and occupational pursuits as reflected in the objectives of the CLIL programme. The test served the purpose of a typical achievement test as it was intended to collect data which revealed how much of the syllabus had been mastered. However, an attempt was made to overcome common approaches to developing a test instrument which solely functions as an assessment tool, measuring students’ achievement in an end-of-term exam with the aim to assign them a passing or failing grade. The underlying principle for its construction was to assess the ability of test-takers who would need to use the TL in contexts where English is established as the major language for communication.

The tasks employed in the test aimed to reflect the purpose for which a text would be actually used for professional purposes in the real world. The starting point for the design of the tasks was a consideration of how the text would be used by a reader; Therefore, every effort was made so that the tasks involved the students in text-processing operations, which represented to the most possible degree the kind of reading skills tertiary level accountancy students’ needed either for study or professional purposes. These involved: understanding the overall message of a text; deciding on an appropriate course of action on the basis of information in the text; recognizing the attitudes and emotions of the writer expressed implicitly or overtly in the text; recording the development of an argument; locating and understanding specific information. The task formats comprised gap-filling, note completion, multiple-choice and multiple-matching tasks.

2.3.2. The Students’ Interview

Insights into the learners’ attitudes towards the TL and the implementation of CLIL were provided through the interviews (N=30), which researched into the learners’ attitudes in two instructional contexts, CLIL and non-CLIL upon the completion of the academic term. The students were randomly selected on the basis of their performance in the OPT (beginners, upper intermediate, advanced) so as to present a representative sample of the target population.

2.4. The Data Analysis Techniques

The data emanated from the pre- and post-intervention CLIL test data, were processed statistically in order to measure the effectiveness of the CLIL programme. The data analysis techniques employed were mean and standard deviation (SD) and ANOVA. The independent variables were the experimental and control group at the pre- and post-intervention. The dependent variables were the subjects’ mean scores in pre- and post-tests.

The verbal data of the semi-structured interviews, which was analyzed qualitatively, underwent the procedures of data reduction, first and second level coding as well as pattern coding. Codes resulted in groups of categories, ‘labeled’ by a specific name (Miles & Huberman, 1994). Then, similar concepts with common characteristics were clustered into themes, so as to reduce the number of categories (Tables 2 & 3).

3. Findings

3.1 The effect of the CLIL intervention on students’ reading performance in terms of content and language

Reading skills development was analyzed for statistical significance using ANOVA which indicated that there was statistically significant interaction between the experimental and control group (F (1,284)=74.986, P<0.001) at the pre- and post-intervention stages. In particular, as shown in table 1, both groups achieved statistically significant progress in terms of reading skills as a consequence of the tuition they had received for an academic semester.
Table 1. Comparison of Pre- and Post-intervention measurements per Group for Reading Skills

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Pre</td>
<td>10.3b</td>
<td>3.46502</td>
<td>139</td>
</tr>
<tr>
<td>Reading Post</td>
<td>13.8a</td>
<td>3.77112</td>
<td>139</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading Pre</td>
<td>10.1b</td>
<td>3.25401</td>
<td>131</td>
</tr>
<tr>
<td>Reading Post</td>
<td>11.0a</td>
<td>3.62122</td>
<td>131</td>
</tr>
</tbody>
</table>

In addition, since the groups were equal in terms of reading competence in the baseline comparison, given their performance in the CLIL test, ANOVA showed that there was no statistically significant difference of the two groups are at the pre-intervention measurement. However, at the post-intervention measurement the experimental group was statistically significantly differentiated from the control group having acquired a considerably higher mean score. Moreover, the difference of the mean scores for the measurements at the post-intervention and pre-intervention stages for the control group were 11-10.1=0.9 while the respective measurements for the experimental group were 13.8-10.3=3.5, figures which signified the estimated relative effect of the teaching intervention as 3.5/0.9=3.9. Consequently, it should be emphasized that the teaching intervention provided to the experimental group in terms of reading skills was 3.9 times more effective. In conclusion, the CLIL teaching intervention is highly valued in terms of reading skills development.

3.2 The Students’ Attitude towards the Target Language and CLIL

The students’ interviews revealed a generally positive attitude towards English, at the beginning of the CLIL and non-CLIL programmed. However, upon completion of the programmed the positive attitude of the students exposed in the CLIL intervention had grown significantly compared to their peers in the control group (Table 2).

Table 2. The Students’ Attitude towards the English Language

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes/ Coding patterns</th>
<th>Experimental Group Pre-Intervention</th>
<th>Experimental Group Post-Intervention</th>
<th>Control Group Pre-Intervention</th>
<th>Control Group Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. THE STUDENTS’ ATTITUDE TOWARDS THE ENGLISH LANGUAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The status of the TL</td>
<td>1.1. Role of English EIL/ ELF REILELF</td>
<td>10</td>
<td>14</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1.2. Major foreign language in Greece MAFLGRE</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>2. Attitude of the TL</td>
<td>2.1. Instrumental role for career purposes INROCAPU</td>
<td>10</td>
<td>14</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>2.2. Instrumental role for study purposes INROSTPU</td>
<td>9</td>
<td>13</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>3. English</td>
<td>2.3. Affective factors concerning TL AFFACOTL</td>
<td>8</td>
<td>13</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2.4. Interest in the target culture INTACU</td>
<td>7</td>
<td>11</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

The interviews also investigated the influence of the implementation of CLIL and non-CLIL programmed on students’ attitudes. It was revealed by the responses provided that CLIL instruction was perceived as more effective and developed a more positive attitude towards learning English as a L2 compared to non-CLIL instruction due to the impact of the distinct features of the CLIL programmed (Table 3).

Table 3. The Students’ Attitude towards the Implementation of CLIL and Non-CLIL

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes/ Coding Patterns</th>
<th>Experimental Group Post-Intervention</th>
<th>Control Group Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. THE STUDENTS’ ATTITUDE TOWARDS THE IMPLEMENTATION OF CLIL AND NON-CLIL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The significance of the course</td>
<td>1.1. Innovative combination of Language &amp; content INCOLACO</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1.2. Efficient in developing content knowledge EFDECOKN</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1.3. Efficient in developing linguistic skills EFDELIKN</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1.4. Motivating for the learners MOLEA</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>1.5. Interesting for the learners INLEA</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>2. The subject-specific content focus</td>
<td>2.1. Subject-specific focus SUSPECOF</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>
2.2. Interesting approach to subject matter INAPSUMA 13 5
2.3. Motivating materials MOMAT 11 6
2.4. Authentic – real-life purposes AURELPU 14 4
2.5. Cognitively challenging COGCHA 12 3
2.6. Consideration of Linguistic Competence COLICO 10 3
2.7. Appealing Layout APPLAY 13 6
3.1. Learn in a relaxed atmosphere LEREAT 10 4
3.2. Arrangements to promote learning ARPROLE 8 1
3.3. Arrangements to facilitate task processing ARFATPR 9 3
3.4. Active engagement ACTEN 8 3
3.5. Interest in participating INPAR 11 5
4.1. Effective tuition of content knowledge ETUCOK 12 8
4.2. Effective training in language and skills EFTRLASK 13 8
4.3. Raise and sustain the students’ interest RASUSIN 11 6
4.4. Help students develop autonomy HESDEAU 10 4
5.1. Positive attitude towards learning English as a L2 14 8
5.2. Positive attitude due to the teaching intervention 15 7

4. Discussion

The data verified both hypotheses and provided support for the efficacy of implementing CLIL in higher education as the experimental group outperformed the control group in terms of both reading skills and content as suggested by their mean scores in the CLIL test. Moreover, concerning their attitudes towards L2 although both groups were positively oriented towards English given its instrumental value at the pre-intervention, the experimental group showed a more positive attitude towards the CLIL course, which considered both content and language goals in L2 and aimed at a full integration of learning both L2 and the subject-specific content of the target discipline. Such intensive use of the of L2 as the language of instruction can be regarded as having been very effective for the development of the learners’ reading skills, which is also in line with Mc Donald’s (1997) research findings. Moreover, it should be noted that CLIL is believed to be more efficient in terms of promoting the students’ comprehension abilities rather than their production abilities (Bialystok, 2005; Swain, 1995).

It was also considered that in the case considered the implementation of CLIL, which efficiently enabled the integration of language and content (Muñoz, 2006), provided the students with enhanced linguistic and cognitive skills and contributed to the acquisition of field-specific content knowledge (Coyle, 2007), adequately equipping them to compete with graduates from other European countries in the global job market. In this respect, CLIL helped to promote students' ability to be able to work in multilingual academic and professional contexts as it focuses on essential skills and the social construction of knowledge (Council of Europe, 2001).

Moreover, every effort was made to involve the learners in using the English language TL for learning and through learning (Coyle, 2000) which was also influential in the development of a more positive towards the TL on the part of the students of the experimental group. Language classes often tend to be an artificial environment focusing on language issues at the expense of relevance and authenticity, a fact which can negatively influence the students’ attitudes towards the FL especially over time (Cenoz, 2001; Heining-Boynton & Haitema, 2007). After all, developing a positive attitude towards the TL presents one of the objectives of CLIL (Hartiala, 2000).

In addition, the CLIL programmed took account of the students’ different learning rhythms, styles and levels of competence, by encouraging diversified methods of teaching and learning, which was valuable considering the heterogeneity of the learners and the large classes in the context at issue. In this way, it was possible to fine-tune the level of linguistic and content complexity, to cater for the learners’ needs and enable them to increase their autonomy in a context of active learning (Wolff, 2011), which increased their motivation and interest in the learning process (Pavesi et al., 2001). The CLIL approach also called for a transformation of the language teacher’s roles in the classroom. More specifically, teachers were expected to assume multiple roles and become facilitators of knowledge and monitor the students' learning rather than merely be the source of knowledge (Marsh, et al., 2011).

Furthermore, the students were presented with materials reflective of how CLIL subjects can motivate the students to discover content and acquire linguistic skills in L2 through the use of engaging materials, which provide a sense of achievement derived from the accomplishment of progressively cognitively challenging tasks throughout
the course, requiring both content and linguistic exploration individually and in co-operation with other students (Jacobs, McCafferty & DaSilva Iddings, 2006).

To sum up, the results of implementing the CLIL programme, indicated that the performance of the experimental group was clearly higher than the control group in spite of the same time exposure as well as comparable amount of reading comprehension exposure, highlighting its effectiveness with regard to the development of linguistic skills such as comprehension and non-linguistic skills such as content knowledge in the TL along with the establishment of more positive attitudes on the part of the learners of the experimental group, which suggest that the adoption of CLIL can lead to positive outcomes in the teaching of the TL.

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