Learning and Instruction xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Learning and Instruction

journal homepage: www.elsevier.com/locate/learninstruc

The effects of CLIL on L1 and content learning: Updated empirical evidence from monolingual contexts

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ARTICLE INFO

Keywords:
CLIL
L1 competence
Content knowledge
Setting
SES

ABSTRACT

This article reports on a quantitative study into the effects of CLIL programs on the L1 competence and content knowledge of Primary and Secondary Education students in monolingual contexts. It has worked with a sample of 2024 students in twelve monolingual provinces in Spain; has guaranteed the homogeneity of bilingual and non-bilingual groups in terms of motivation, verbal intelligence, and English level; and has factored in type of school, setting, and socioeconomic status as intervening variables. It has also carried out successive discriminant analyses in order to determine which variables are responsible for the differences ascertained. The results evince that CLIL is not detrimentally impacting L1 competence and is not watering down content learning, on which the positive impact of CLIL is particularly felt in the long term. The modulating effect exerted by the moderating variables considered is substantial for type of school and SES, but not for rural-urban setting.

1. Introduction

At a time when, increasingly, "(bi)multilingualism is the norm whereas monolingualism is the exception" (Ouazizi, 2016, p. 113), the European approach to bilingual education –CLIL (Content and Language Integrated Learning)[1]- has been enthusiastically embraced as a lever for change and success in language learning. Over the course of the past two decades, it has become "a well-established part of education systems across Europe" (Surmont, Struys, Van Den Noort, & Van De Craen, 2016, p. 320) and is also being increasingly adopted in Latin American and Asian countries (Banegas, 2012; Lara Herrera, 2015; Liberali, 2013) as the potential lynchpin "to move from to move from monolingual education systems into bilingual ones, or from bilingual systems into multilingual ones" (Doiz & Lasagabaster, 2017, p. 1).

Concomitantly, the body of research tapping into the effects and functioning of CLIL programs has been growing steadily and the extremely substantial number of publications on the topic attest to the fact that it has become an extremely "prolific phenomenon" (Jäppinen, 2005, p. 149). There are four main strands around which Wolff (2005) considers CLIL investigations should be articulated: the effects of CLIL on the acquisition of the foreign language (FL), the L1, and content subject competence, and the evaluation of dual-focused education by teachers and students. While the first and last of these aspects have spawned an inordinate amount of research (cf. Dalton-Puffer, 2011 and Pérez Cañado, 2012 for an overview of quantitative and qualitative research), the second and third issues have been comparatively underresearched.

Indeed, numerous authors underscore the need for L1 development and subject content knowledge to figure prominently on the future CLIL research agenda (Cenoz, Genesee, & Gorter, 2013; Dalton-Puffer, Llinares, Lorenzo, & Nikula, 2014; Lasagabaster & Ruiz de Zarobe, 2010; Paran, 2013; Pérez Cañado, 2017). There is a well-documented "paucity of research into content outcomes" (Paran, 2013, p. 318) which verges on "neglect" according to this author (2013, p. 324) and which leads other scholars like Dallinger, Jonkmann, Hollm, and Fiege (2016, p. 25) to claim that "the effects of CLIL on content learning remain an open question".

This article seeks to address this niche by providing updated empirical evidence on the effects of CLIL on L1 and content learning in monolingual contexts, where there is an even more conspicuous "shortage of research in CLIL" (Fernández-Sanjurjo, Fernández-Costales & Arias Blanco, 2017, p. 2). To this end, it reports on a study framed within two governmentally-funded research projects (cf. Acknowledgements) which supersedes many of the lacunae of prior investigations on the topic. In this sense, it works with one of the largest cohorts in the studies hereto conducted (2024 students in three monolingual communities of Spain: Andalusia, Extremadura, and the Canary Islands); guarantees the homogeneity of CLIL experimental and non-CLIL

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[1] CLIL is defined as "a dual-focussed education approach in which an additional language is used for the learning and teaching of both content and language" (Marsh & Langé, 2000, p. 2). The emphasis on both teaching and content points to the very hallmark of CLIL: it involves a "two for one" approach (Lyster, 2007, p. 2), where subject matter teaching is used at least some of the time as a means of increased meaningful exposure to the target language.

https://doi.org/10.1016/j.learninstruc.2017.12.002
Received 30 April 2017; Received in revised form 5 December 2017; Accepted 7 December 2017

control groups; focuses on two different educational levels (Primary and Secondary Education); factors in intervening variables pertaining to socioeconomic status (SES), setting (rural-urban), and type of school (public, charter,[2] and private); and carries out discriminant analyses to determine which variables are truly responsible for the differences ascertained.

After framing the topic against the backdrop of prior investigations, the article goes on to describe the research design of the study and reports on the performance of bilingual and non-bilingual streams at the end of Primary and Compulsory Secondary Education (CSE) on L1 and content learning in Natural Science subjects both globally and specifically, comparing their attainment across types of schools, setting, and SES. Successive discriminant analyses will allow us to isolate those variables which best explain the statistically significant differences ascertained between the groups. The article will draw to a close by foregrounding the chief conclusions which can be gleaned from the data and by signposting the most significant pedagogical implications which can be derived from our findings.

2. A critical reading of prior research

The effects of bilingual education on L1 and content learning were initially explored by the numerous studies carried out on Canadian immersion and North American bilingual teaching models, both considered the predecessors of CLIL (Dulay, Burt, & Krashen, 1982; Genesee, 1987, 1994, 2004). The outcomes attested to the success of bilingual programs on these two fronts, as the development of the native language was not at all curtailed and knowledge of the subject matter taught in the second language was attained at the same high level as the monolingual groups. However, the findings gleaned from these settings cannot be transposed or extrapolated to the CLIL scenario, as they are highly context-specific and their generalizability from one situation to another is thus severely limited: "(…) most of the immersion conditions (…) bear little resemblance to the study of English through CLIL programmes in Europe, particularly in terms of the sociolinguistic and sociocultural context in which the L2 is learned and the authenticity of the input" (Gallardo del Puerto, Gómez Lacabex, & García Lecumberri, 2009, p. 65). Thus, a more specific look should be cast to the European CLIL context, where research on these two aspects is more limited and yields more mixed results. The global picture is thus far from consensual.

Indeed, although the effects of CLIL on L1 and content learning have been explored for nearly two decades, the amount of studies on these research strands is still meager. The investigations hereto conducted tend to focus on three main content areas (Mathematics, Geography and History, and Natural Science) and a roughly equal number centers on Primary or Secondary Education. Most of the studies conducted yield positive outcomes for L1 and content acquisition in CLIL programs, several have found no differences between bilingual and non-bilingual streams, and a growing body of research (particularly in the last year) reports the negative consequences of CLIL on these two aspects.

Studies from the very outset of CLIL research (1999) to the present moment (2016) have recurrently indicated that CLIL not only positively affects FL learning, but also L1 development and content acquisition. Such is the case of one of the first quantitative studies into the topic, conducted by Wode (1999) in Germany and which notes that CLIL streams in Secondary Education outperform their monolingual counterparts in History and Geography learning. Jäppinen (2005) approached the topic by focusing on thinking and content learning processes in Mathematics and Science with 669 Finnish learners from 7 to 15 years of age. She concluded that CLIL environments create favorable conditions for the development of both processes and thus seem to have positive repercussions on subject matter acquisition. Serra (2007) equally centered on Mathematics, albeit in a Primary Education context, in a longitudinal study with three public Swiss schools, where CLIL strands once again outstripped their mainstream peers. Also focused on Primary Education, Xanthou's (2011) investigation involved two small-scale experiments within the subject of Science in Cyprus, and concluded that content teaching through English was again beneficial for the CLIL students.

That same year, Madrid and Hughes (2011) carry out a more comprehensive study with Primary and Secondary school learners in a Spanish monolingual context: that of Andalusia. Theirs is a particularly interesting endeavor, as it is one of the few studies which factors in type of school as an intervening variable. Public bilingual, private bilingual, and charter monolingual schools were compared and very encouraging results were obtained for both the L1 (Spanish) and content subject learning (Natural and Social Sciences at Primary level and Social Science in Secondary Education). In the L1, the public and private bilingual groups outperform the public and charter monolingual ones in Primary Education, while the charter monolingual is significantly best at the end of Compulsory Secondary Education. Bilingual education, thus, does not seem to detract from the L1 in this study. Vis-à-vis subject matter knowledge, much the same pattern transpires: the private and public bilingual schools obtain significantly higher outcomes for Primary Education and the charter monolingual, for Secondary level. The public monolingual strands lag behind the rest of the groups in both domains, which causes the authors to voice their concern for equity in this context, "where important measures would be required to counter the worrying performance of the students across all education ladder rungs" (Pérez Cañado, 2011, p. 396).

More recently, Surmont et al. (2016) and Ouazizi (2016) have reported positive findings for CLIL Secondary Education students in Belgium studying Mathematics in French. Whereas the CLIL and monolingual branches did not differ on mathematical scores in an initial pretest, significantly higher scores were reported for the CLIL group after just three months of Mathematics instruction in the L2 and again after ten months. The authors conclude that CLIL seems to exert a positive influence on mathematical performance in both the short and long term, which the authors potentially ascribe to the fact that CLIL influences cognitive development, "which results in better outcomes in science and/or mathematics" (Surmont et al., 2016, p. 328). The links between languages and Mathematics should also be explored and capitalized on, according to the authors.

A second batch of studies has found no differences between CLIL and mainstream groups on L1 and content learning. Bergroth (2006) conducted a quantitative study in Finland to gauge the impact of Swedish CLIL on the L1 (Finnish) and Mathematics with pupils taking the Finnish matriculation examination after Secondary school (a pretest was not included). No differences emerged between the treatment and comparison groups, which led the author to conclude that the mother tongue and content knowledge are not threatened by dual-focused education, as the CLIL students perform just as well as their monolingual peers. Similarly, no negative effects were found for subject matter achievement (in History and Geography) and the L1 in Admiraal, Westhoff and de Bot's (2006) longitudinal study with Dutch Secondary Education students. This study measured the effects of English CLIL instruction on the L1, L2, and content learning of Dutch bilingual students as compared to regular monolingual streams over the course of the first four years of Secondary Education. Merisuo-Storm (2006, 2007) only focused on L1 literacy skills of CLIL tracks and regular students at the outset of Primary Education and, again, found no statistically significant differences between both cohorts in terms of mother tongue literacy skills, although the CLIL streams were found to harbor more positive attitudes towards language learning than the mainstream group. This study is particularly interesting on two counts: it was longitudinal (the tests were administered at the beginning of first grade and at the end of second grade) and it considered school readiness and gender as intervening variables. Finally, Stehler (2006) also

[2] Charter schools are state-financed schools with a religious orientation.