

A Meta-review Analysis of Research on Technology-assisted Content and Language Integrated Learning

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Abstract: Currently, the integration of Content and Language Integrated Learning (CLIL) and digital technology has become widespread all around the world mostly in European countries, which is used for teaching English as a foreign language. However, the trend of using digital technology integrated CLIL in English language education still lacks systematic analysis. The present study aims to examine the published research articles in academic journals, indexed by the Scopus database from 2010 to 2019 was conducted to investigate in terms of nationalities, authors, journals, research methods, research issues, technology learning materials, and educational stages. The finding revealed that the use of CLIL integrated digital technology in English language learning has been positively successful in developing students' learning motivation and competence, not only technological skills but also content subjects and English language competencies. The results show that video technology was the most popular tool for enhancing students' motivation and promoting students' learning ability in English language within the context of CLIL methodology. Therefore, the highest interesting research method was system development that concern of digital technology development which contributes to better effective learning tools. Based on the overall finding, it is clear that CLIL integrated digital technology is an effective tool in English foreign language learning. Although the studies quite still rather low in the last recent year and also mainly in European countries that focusing on higher educational participants, it could bring some challenges of the limited practice to explore the use of CLIL blended technology in learning English in school within Asian countries that are increasingly bilingual setting.

Keywords: CLIL, Digital technology, Language learning, English language education

1. Introduction

Nowadays, more than ever before, the world has entered the 21st century that is an era of progress in politics, economy, society, especially technology and innovation. The world has turned into an enormous and interconnected network. English has become a universal language that is being taught all over the world. The importance of being well in English comprehension is heavily emphasized, ensuring that future generations can survive in a globalized world. On the contrary, the increasing demand for English language has made it an invaluable skill but the traditional learning English in the classroom is not enough anymore. Language teaching is not limited to direct language teaching like before. The integration of content subjects should be used in teaching and learning language. Content and language integrated learning (CLIL) is a phenomenon that is occurring all over the world, many countries already successfully use CLIL in practice. CLIL is based on the integration of subject and language content together refer to teaching of non-linguistic subjects (e.g. Science, Mathematics, History) through the medium of a second or foreign language. CLIL is learning to improve and develop students to have a learning experience from the integration between the two subjects (Pitura & Chmielarz, 2017). CLIL is a dual-focused approach which is a method that gives equal attention to language and content that is widely accepted as teaching (Mehisto, Marsh, & Frigols, 2008). Besides, CLIL can be used for improving the efficiency of language learning and for motivating learners. Several research outcomes

have been resulted in learning performance improving and motivation encouraging. CLIL learners were better target language performance, high motivation, and more linguistic and academic ability (Bruton, 2011).

People in the 21st century usually live in a modern technology environment such as computers, tablets, smartphones, and digital media. It can be said that children who are growing up in this 21st century are digital natives, they have a different lifestyle from the past. The impact of technology can be touch in every possible field, including in education. Currently, the way of students learning in the classroom is changed, because today's students' backgrounds are quite dissimilar from the former times (Taranto, Dalbon, & Gaetano, 2011). Technology has been also increasing in English language learning and teaching to make the learning environment more effective, enjoyable, and comfortable. Several studies have been conducted to determine the use of technology in various platforms to enhance students in English language learning, computer-assisted instruction could also assist in vocabulary advancement as well as verbal language advancement with the exact positive outcome (Timothy, 2005). Beyond, the use of mobile phones and/or smartphones and their applications create positive effects on learning English as a foreign language in the development of learners' vocabulary and their increased students' learning motivation (Klimova, 2017).

Since the popularization of CLIL and technology, the integration of content and language integrated learning (CLIL) and technology has become an increasingly important role in supporting the development of students' foreign language skills and increasing understanding of subject matter. Numerous researchers in a wide range of fields have discussed their benefits. There is growing evidence that in the right context, CLIL and technology can be used to enhance students' motivation and learning outcomes. All in all, CLIL and technology combination resembles to be a trending area of research and practice. This systematic review expands the existing literature by framing the discussion around.

2. Literature Review

2.1 Content and Language Integrated Learning (CLIL)

The term "content and language integrated learning" (CLIL) was introduced by the European scholar David Marsh in 1994 (Coyle, Hood, & Marsh, 2010) as an attempt to combine language and content through a foreign language (mostly English language). CLIL has been received wide recognition due to being universal and simply adaptable to all foreign languages (Maljers, Marsh, & Wolff, 2007; Marsh, 1994). CLIL is an effective approach to enhancing English competence as it helps students improve a positive attitude towards themselves as language learners (Mehisto & Marsh, 2011). Likewise, technological advances and innovation are now an essential part of the educational course all around the world. Technology presents an excellent opportunity for communicative language learning. Digital technology can be adapted to the new educational trend that is content and language integrated learning (CLIL) and help learners develop their language learning as it simplifies dynamic education, the ability to share experiences in the foreign language (Marsh, 2001).

In recent years, several studies about the integration of content and language integrated learning (CLIL) and technology in foreign language learning have been presented. The simple technology integration of CLIL can be observed using PowerPoint presentations and viewing YouTube videos (Esteban, 2015). CLIL and technology integration is widely found among using a variety of technology resources. For instance, the use of video to motivate students' motivation in learning history and science subjects within the CLIL. The finding indicated that students' are more motivated when learning history and science subjects through CLIL approach if videos are used, the use of videos in the classroom motivates students by creating a relaxing and comfortable environment in CLIL educational setting (Tragant, Marsol, & Serrano, 2015). Additionally, applying gamification to an extracurricular CLIL project intended to develop students' perceptions in biology. The result showed that students were driven by enjoyment, curiosity, as well as a sense of community and achievement with the new digital tools. Students connected English language skills by using language challenging social activities, where was the basis on content and not on language (García & Jurado, 2019). Moreover, the result of an

integration of CLIL and Web 2.0-based teaching materials indicated that the positive changes in the state of the experiment group.

According to the literature review, the popularization of researchers who are attempting to apply the integration of CLIL and technology to develop students' competence, providing educators with information to prepare appropriate learning activities for their students, and what designers need to consider when creating English language learning within CLIL integrated technology. To enable the research and development in teaching English as a foreign language toward CLIL and technology combination to become more enlightened, analyzing previous research trends in the integration of CLIL and technology in foreign language education has become significant. To provide more details, the literature was analyzed to understand the finding of CLIL and technology combination in foreign language education in the past, the research trends and issues are suggested.

3. Research Methodology

3.1 Resource

This research study investigated papers from the Scopus database from 2010 to 2019 by searching for the publications whose titles, abstracts, or keywords met the logical condition (“CLIL” or “content and language integrated learning” and (“technology” or “technologies” or “technological”). A total of 81 papers published in journals were appropriated for this study. By removing 46 non-article papers and non-English papers, 35 papers were included in the present study by deleting 25 papers which were not related to the integration of CLIL and technology in English as a foreign language learning. Therefore the total papers that mention in the integration of CLIL and technology in English as a foreign language learning are 10 papers. The following diagram in Figure 1 shows the steps of searching for papers on the Scopus database.

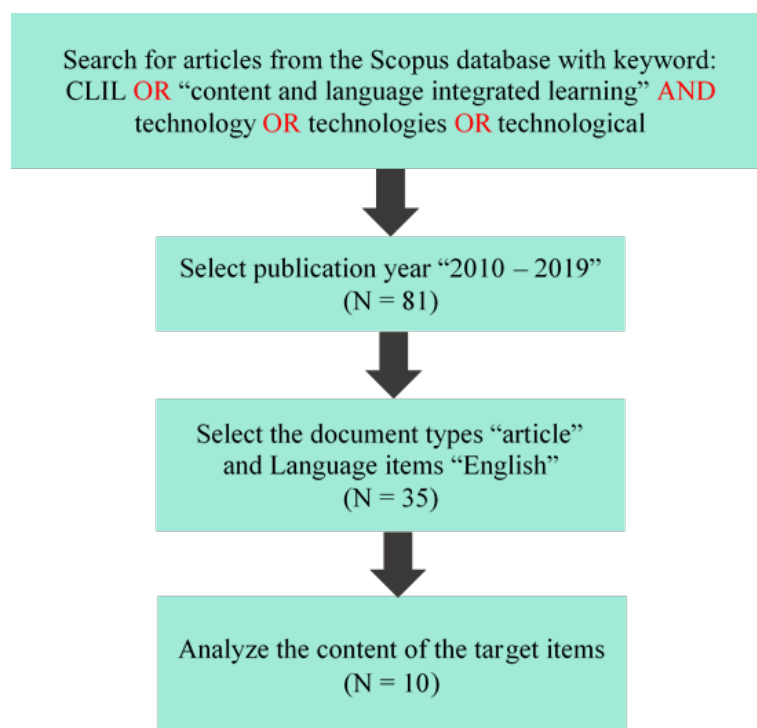


Figure 1. Scopus database searching steps

3.2 Data distribution

There were 81 papers in this review. The papers were classified and reviewed by two researchers based on the coding schemes. If there were contradictory coding results, they would discuss until an agreement was reached.

Figure 2 illustrates the papers on the integration of CLIL and technology in English as a foreign language learning from 2010 to 2019. There were no literature reviews on CLIL and technology combination in English as a foreign language learning in 2010; after 2010, no more than 5 papers on the integration of CLIL and technology in the foreign language were published each year. The scholars took more interested in this field since 2016, with 4 papers published in 2016.

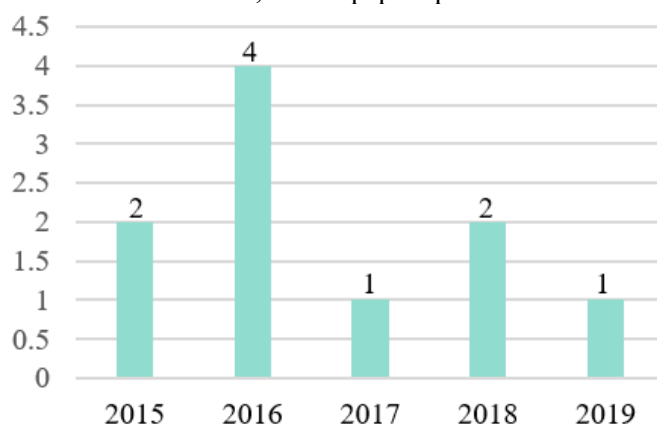


Figure 2. Published papers on the integration of CLIL and technology in English language learning from 2010 to 2019

3.3 Coding schemes

In the present review, the categories for analyzing the contents in this study, composed of nationalities, authors, journals, research methods, research issues, (Chang & Hwang, 2019; Chang, Lai, & Hwang, 2017) technology learning materials, and educational stages. The following items describe the coding scheme in each dimension:

Nationalities, authors, and journals: The standard information of those published papers are discussed, including authors, nationalities, and journals. The objective is to realize that who and which countries have more frequently published papers on the integration of CLIL and technology in English language learning.

Research methods: The category of research methods was based on the 4 common research methods consisting of the system development, questionnaire survey, qualitative research method, and mixed methods.

Research issues: The research issues examined CLIL blended technology in English education including the affective aspect and cognitive aspect.

Technology learning materials: Technology integrated CLIL setting were Web Quests, video, web 2.0, digital content such as social media (that is blogs), YouTube, Facebook page, multimedia, audio, online web (online dictionary, TESOL websites, Google search, and telecollaboration), and digital game.

Educational stages: The education stages of participants in CLIL and technology combination in English language learning were primary education, upper secondary education, higher education, and teacher.

4. Research results

4.1 Nationalities, authors, and journals

In this review, the researchers examined only the nationalities of the first author of the papers on CLIL and technology combination in English as a foreign language learning. The result pointed out the most

popular country is Spain for 5 papers.

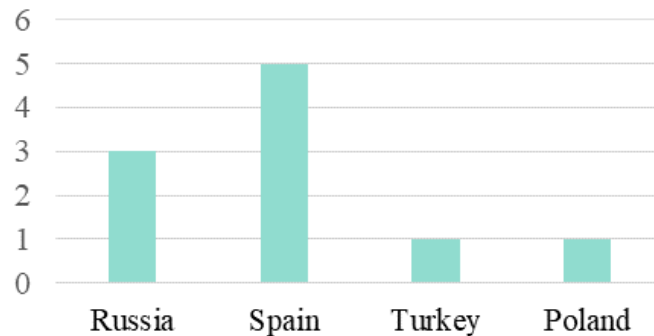


Figure 3. Countries publishing on the integration of CLIL and technology in English language learning from 2010 to 2019

The journals which published are Social Sciences (Pakistan), Education for Chemical Engineers, Mondo Digitale, Journal of Language and Literature, Anthropologist, International Journal of Educational Technology in Higher Education, Teaching English with Technology, Cypriot Journal of Educational Sciences, Theory into Practice, and Multidisciplinary Journal of Educational Research. The statistical results of the authors and journal titles in Figure 4 could be a good reference to those who intend to publish the integration of CLIL and technology in English learning or host relevant workshops or conferences in the future.

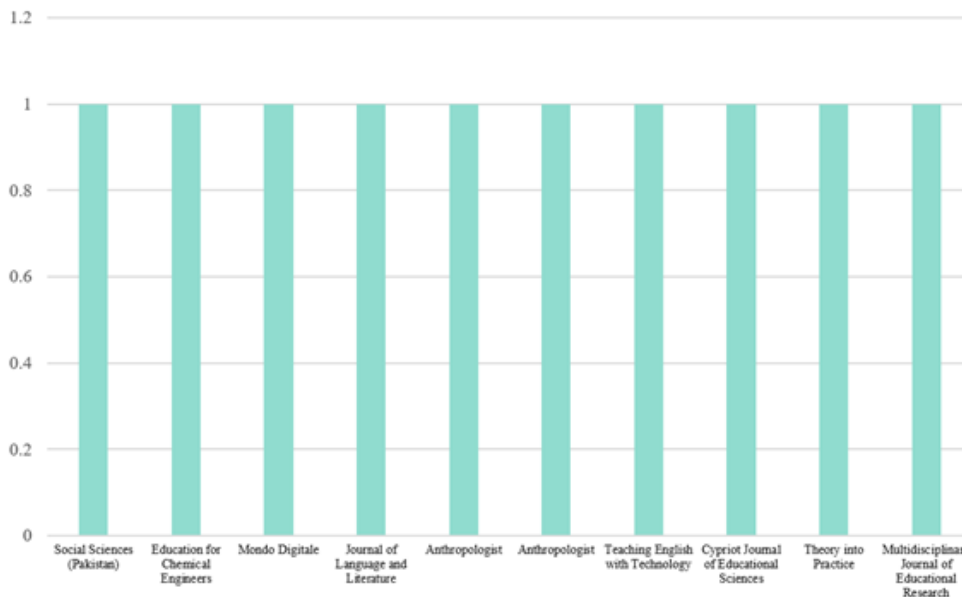


Figure 4. Journals publishing on CLIL integrated technology in English language learning from 2010 to 2019

4.2 Research methods

In this study, the researchers evaluated the research methods in each article including the system development, questionnaire survey, qualitative research method, and mixed methods. Six papers were adopted in the system development which developing digital technology and online website then verified its effects. The other two papers were divided into documentary research that is a qualitative research method, which examined an example of the use of technology combined CLIL in English language learning and another paper adopted in the mixed method which indicated the use of video within the classroom motivated students. Another paper was classified into a questionnaire survey that

explored students' learning development in English through CLIL integrated technology.

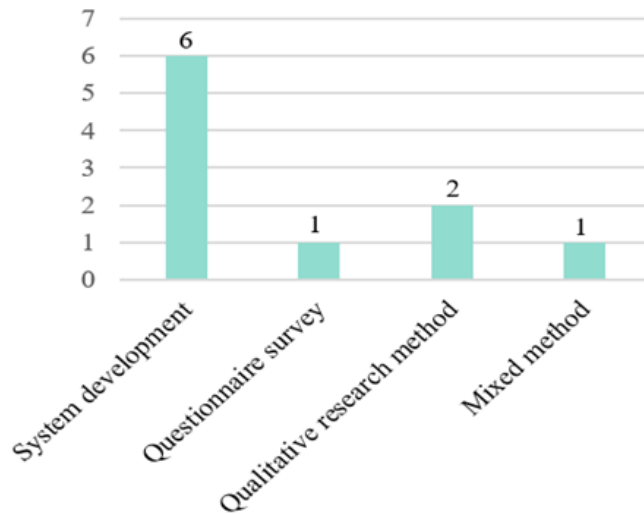


Figure 5. Research methods on the integration of CLIL and technology in English language learning from 2010 to 2019

4.3 Research issues

The research issues were analyzed in CLIL integrated technology in English language learning including cognitive aspect and affective aspect. The results show that the studies on the cognitive aspect for 6 papers and the other 5 papers focused on both cognitive and affective aspects. Thus cognitive domain and affective domain were mainly concern with most CLIL blended technology in foreign language education research. Numerous researchers intended to integrated technology into the CLIL classroom by creating a modern technological environment in a bilingual setting to develop students' competencies in both language and technology knowledge. Furthermore, some researchers focus on both motivation and knowledge at the same time because motivation is determined to be one of the considering factors that effective learning in any context.

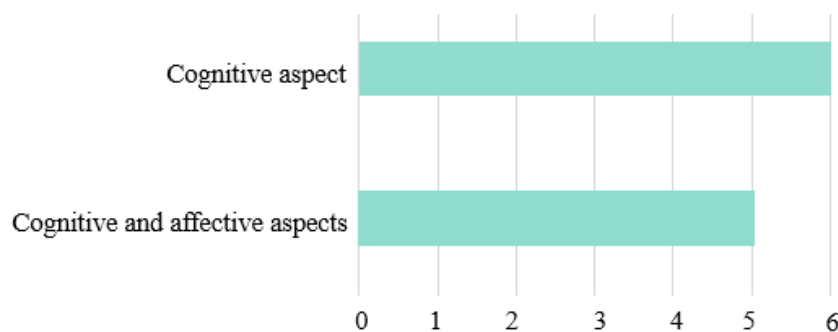


Figure 6. Research issues on CLIL and technology combination in English language learning from 2010 to 2019

4.4 Technology learning materials

Technological advances are now an indispensable part of language education. In this study, we examined the integration of digital technology into CLIL class. Figure 7 displays a summary result on the application of several technology teaching materials in a foreign language. The top three highest number of technologies for CLIL-based English language learning are video, online web, and web quest with five, four, and three total papers, respectively. Likewise, the analysis shows other technologies are web 2.0 and audio.

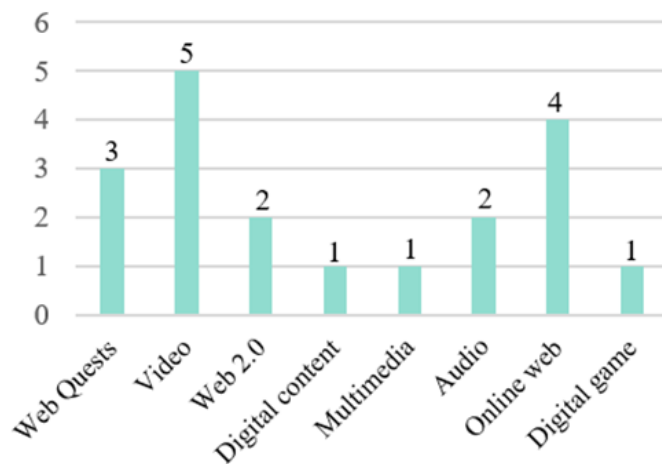


Figure 7. Technology learning materials of CLIL and technology combination in English language learning from 2010 to 2019

4.5 Educational stages

The researchers investigated the educational stages of the participants in this research including primary education, upper secondary education, higher education, and even teacher. Figure 8 illustrates the participants involved in learning English as a foreign language through CLIL integrated technology. The result shows that almost the participants were higher education which took place in the university with 6 papers. Even most of the papers investigated the integration of CLIL and technology in English language learning were effective in higher education, applying the combination of CLIL and technology in English language learning into the school could be challenging. To the point of view, the integration of technology and CLIL in English as a foreign language learning did not only focus on students but also the teachers because of the teacher teaching perspectives needed to give priority.

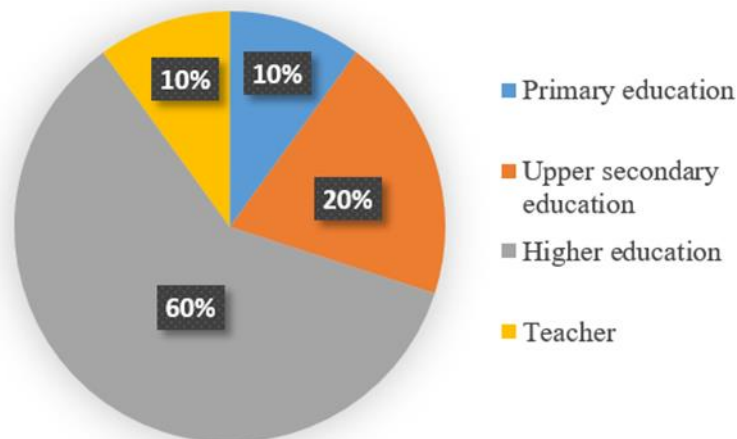


Figure 8. Ratio of educational stage on the integration of CLIL and technology in English language learning from 2010 to 2019

5. Conclusion and discussion

This study was examined a meta-review and analysis of the integration of CLIL and technology in English as a foreign language learning from 2010 to 2019. The results revealed that even the polarization of the use of technology in English language education and the most successful of CLIL approach were impacted on students' motivation and their competence but the number of the study of CLIL integrated technology in learning English was still quite low and mainly in European countries that the original of

CLIL approach and famous bilingual education area, due to the limited of the language instructors' in content knowledge, language skills, or technological competencies. It is not easy for the instructor to be skilfully in all three main skills (content subjects, language skills, and technology competencies) and applying in the teaching process. It was found that a lot of studies used system development of technology in the CLIL environment which focuses on English language learning that means the researchers tried to engage the technology advantages in language learning.

Additionally, it was highlighted that the research issues both motivation and learning outcomes were most investigated in this area. This indicated that learning English in CLIL blended technology not only focuses on students' enjoyment experience in developing technical competencies but also engaged subject contents and language skills at the same time which remains a challenging and important issue.

In contrast, it can be found that various technology platforms in CLIL integrated technology in English learning such as multimedia, digital game, and audio. The most popular technology tools were video and online website because of the technology advantages; an excellent interactive media that students could look at the picture, hear the sound and real-time interactive media, therefore students can learn English language in the real situation while they received the information from those technology tools. Besides, even most studies took part in the participants in higher education, it will beyond the challenge to apply technology combined CLIL in English language learning in school.

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