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The Clash between CLIL and TELL: Effects and Potential Solutions of Adapting TELL for Online CLIL Teaching

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Abstract: The relationship between technology and society is an ever-changing dynamic, but one in which education is a key domain. In educational practice, the use of computer technology has increasingly become an inseparable part of teaching students in numerous ways across the world. The COVID-19 global pandemic accelerated this dramatically, with online teaching environments becoming the sole way for students to access education for extended periods of time. This shift to online teaching also required that teachers learn new skills and deal with new challenges. Based on mixed-methods research conducted with 20 teachers from an established content and language integrated learning school in mainland China, this research paper investigates the different challenges and problems that were faced by content and language integrated learning teachers in their experiences of online teaching and, in tandem with wider content and language integrated learning and technology-enhanced language learning literature, develops some potential solutions for future use.

Keywords: content and language integrated learning; technology-enhanced language learning; CLIL and TELL compatibility; online CLIL course evaluation system; effective teacher training

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1. Introduction

Since the outbreak of COVID-19 in 2019, travel, business, education, and other activities involving big gatherings of people have been severely impacted in numerous nations. Consequently, the work of many individuals shifted from offline to online, including the teaching mode in many schools in China. Teachers were required to teach online to guarantee that students' learning progress was not impeded. Although online teaching tools give teachers vast options and freedom from teaching in a physical classroom, as the phenomena of online education gain popularity, signaled by the increase in research concerning the mix of technology and education [1], more teachers and students realize that online class differs from offline education in terms of pedagogical approaches and challenges to effective learning, and this transition also poses some significant obstacles for teaching CLIL. As Walker and White [2] state, "the last few decades have seen as an exponential growth in the use of technology for language learning and teaching purposes", and with the massive shift to online education that the COVID-19 pandemic provoked, developing better understandings of the relationships between digital technology and education practice is essential.

Therefore, this paper focuses on content and language integrated learning (CLIL) teachers and their experiences with the transition to online teaching. First, CLIL refers to the context where school subjects are taught in a foreign language with a dual-focused aim: content acquisition and foreign language acquisition [3]. Second, the global pandemic unleashed a period of confusion and stress during which many teachers felt unable to fully utilize the potential of digital technology. One way in which the integration of technology within language learning environments has been explored is through the concept of technology-enhanced language learning (TELL), which has been introduced as an improvement on the earlier concept of computer-assisted language learning (CALL)

by recognizing that "one of the main differences between CALL and TELL is that we see technology not as assisting language learning, but as part of the environment in which language exists and is used" [2]. Such digital technologies that are relevant to TELL include multimedia computers, the internet, mobiles, smart boards, videotapes, and so on [4]. As a result, the challenges faced by various types of online teachers must therefore be identified and summarized, and potential solutions must be offered based on the teaching experiences of various teachers and the body of available literature in order to increase the effectiveness of integrated TELL–CLIL online teaching.

There have been insufficient studies on integrating TELL and CLIL in online instruction, signaling a gap in the literature. Therefore, in order to contribute to the filling of this gap, in mainland China, this research employed a school-based case study using a mixed-method methodological framework, integrating both quantitative and qualitative methods, to investigate various teachers' perspectives on the intersection of CLIL teaching and TELL online teaching resources, as well as the challenges they face. The contents of this research will be analyzed and discussed in the course of this paper. Then, based on the teachers' teaching experience and existing literature, some potential solutions for overcoming teaching challenges and enhancing the quality of CLIL and TELL-integrated online teaching will be presented.

2. Questions concerning the Relationship between CLIL and Digital/Computer Technology

2.1. What Is Content and Language Integrated Learning (CLIL)?

In 1994, education researchers David Marsh and Anne Maljers invented the term CLIL. As the name suggests, it combines subject matter learning and language learning into a single educational endeavor. Consequently, CLIL refers to the process of teaching courses or subjects in a foreign language with two concurrent goals in mind, namely, content acquisition and foreign language acquisition [3]. Moreover, empirical research on second language acquisition reveals that languages are acquired simultaneously to being used, i.e., "language learning equals language use" [5]. Consequently, any subject matter in CLIL is transformed into a meaningful linguistic context for language acquisition and practice, indicating the viability of CLIL as a method for teaching subjects to students in a foreign language [6]. Therefore, CLIL expands the alternatives for language learning and practice without increasing the amount of time allocated to language studies in the curriculum.

2.2. CALL or TELL?

During the previous few decades, the use of digital technology for language learning and teaching has grown exponentially with the popularity of ICT (information and communication technology) and its wide range of applications in various fields, such as computer science, business, and education [2]. ICT refers to a collection of technical tools and resources that, with technical assistance, enable information transmission, processing, storage, and exchange [7–9]. To better explore the integrated nature of CLIL and to gain a more thorough comprehension of this integrated relationship, some researchers attempt to use technology as a bridge to connect and integrate subject knowledge and language acquisition in CLIL instruction. As a result, teaching models combining CALL and CLIL have been proposed by different researchers.

Computer-assisted language learning (CALL) is the search for and study of computer-based language teaching and learning applications [10]. Specifically, it refers to the study and practice of foreign languages via the use of digital technology, such as computers, but also smartphones, tablets, MP3 players, and gaming consoles [11]. Warschauer and Kern [12] defined three stages of computer-assisted language learning (CALL) development and related them to a universal paradigm of language learning and technology in the year 2000: The first phase, known as "Structural CALL", focuses on drill and practice and views language as a formal structural system (grammar, phonology, etc.). The second phase, "Communicative CALL", is based on the communicative language teaching (CLT) technique and considers language information as formed in the learner's mind instead

of a set of external rules. Warschauer calls the third phase "integrative", referring to applications still attached to desktop computers at the beginning of the 21st century. However, Bax ([13], p. 23) forecasts in the third phrase devices that are 'very different in shape and size from their current manifestations'. He believes that once the technology is fully standardized, "integrated CALL" will become a reality, and the "CALL" will no longer be a meaningful structure because the technology is indivisible. Walker and White [2] support Bax's perspective and assert that we have reached the third stage that Bax identifies, in which digital devices have become an integral part of daily life. This also leads to the development of another term from the foundation of CALL: TELL (technology-enhanced language learning). Walker and White [2] claim that one of the most significant distinctions between CALL and TELL is that we do not view technology as a language learning aid but rather as part of the environment in which language exists and is used. Thus, TELL emphasizes technology as an authentic setting for language use, which is congruent with CLIL's focus. As Rose [14] points out, providing an authentic context for children to allow them to acquire language spontaneously is essential in CLIL class. In general, TELL is the outcome of the advancement of CALL. It is a structural development that follows the high level of informationalization and the ubiquity of science and technology in our society.

Table 1 describes the various stages of CALL and TELL and their relationship with various learning techniques and language psychology.

Table 1. From CALL to TELL (Reprinted with permission from Ref. [2]. Copyright 2013, Walker Aisha, Goodith White) [2].

Approach	Structural/Restricted CALL	Communicative CALL Open CALL	Integrative CALL	TELL
Technology	From mainframe to mobile	PCs	Multimedia, internet	Mobile devices, tables, multiplayer games, virtual worlds
English teaching paradigm	Grammar translation and audio-lingual	Communicative language teaching	Content-based ESP/EAP	Communication, interaction
View of language	Structural (a formal structual system)	Cognitive (a mentally constructed system)	Socio-cognitive (developed in social interaction)	Structural, cognitive, socio-cognitive, adaptable
Principal use of technology	Drill and practice	Communicative exercises	Authentic discourse	Normalized
Principal objective	Accuracy	Fluency	Agency	Autonomy within community
View of learning	Behaviourism	Constructivism	Social construc-tivism/situated learning	Connectivism
Role of technology	Tutor	Tutee	Mediational tool	Environment resource

Consequently, it is clear from the table above that TELL is more adaptable and offers a greater variety of independent possibilities than CALL. For instance, it is clear from the first point about technology that TELL can offer educators and students that technology equipment is more versatile and portable when compared with CALL. TELL is also more integrated than CALL. As an illustration, in the third element, TELL ultimately exemplifies the integration of TELL by combining all the development traits of earlier CALL and creating a new adaptable feature. In general, TELL is the outcome of the advancement of CALL. It is a natural development that follows the high level of informationalization and the ubiquity of science and technology in our society.

2.3. How Have New Digital Technologies Impacted CLIL Learning?

According to a report [11] for the European Commission based on a systematic analysis of published and unpublished literature on applying CLIL and technology to enhance language acquisition, students have benefited in various ways when digital technologies

and CLIL teaching have been combined. The advantages of incorporating technologies and CLIL instruction are divided approximately into four aspects: multiple opportunities for learning, personalized learning pathway, language competence improvement, and motivation and confidence of students.

2.3.1. Multiple Opportunities for Learning

It is generally acknowledged that language acquisition requires comprehensible language input [15]. TELL can supply infinite input, but teachers, software developers, and even learners frequently need to step in to make it intelligible, claim Walker and White [2]. Examples include providing hyperlinks to online dictionaries, explanations, and translations (or for students to search for themselves). They [2] also note that TELL could offer a variety of possibilities for learners to produce content through social engagement with others, such as blog posting and e-mail. Thus Walker and White [8] conclude that introducing TELL into the classroom could result in a systematic set of instructional steps, namely, "(1) input (2) output (3) input and output, and possibly repetition, as students repeat the task in an attempt to get a better score (4) input, output, interaction (5) input, output, interaction (6) input, output, repetition (7) input, output, interaction (8) output, repetition" (p. 292), while this systematic teaching procedure is also aligned with the CLIL core elements that Meyer [16] proposed.

2.3.2. Personalized Learning Pathway

TELL allows students to study in two different ways without being constrained by a specific location or textbook. According to Myles and Mitchell [15], TELL can offer "differentiated" activities for all types of learners. Extending the scope of learning environments broadens the range of learning environments such that they are no longer restricted to the classroom but incorporate mobile devices and computers outside the classroom. Hence, TELL can be a learning facilitator in a CLIL classroom. It can enhance the opportunities for face-to-face learning and improve distant learning [17]. The introduction of technology has altered our perception of the function of textbooks. The use of TELL activities to complement the learning goals in the textbook enables teachers to fulfill the needs and preferences of learners with varying needs and preferences and to grant those learners greater autonomy. Students are the "tacticians" who employ these technological tools in their unique ways to construct personalized learning routes [2].

2.3.3. Language Competence Improvement

The study of Golonka et al. [18] finds that learners demonstrate pre- and post-test improvements in speaking, reading comprehension, vocabulary, and grammar through intelligent tutoring technologies in a CLIL class. For example, by providing appropriate feedback and instruction to students from the technological expert models: computer-assisted pronunciation training (CAPT), especially automatic speech recognition (ASR), can facilitate pronunciation development and provide feedback as effectively as the teacher. Students can be less nervous about pronouncing words in front of classmates and teachers when practicing alone [19]. In addition, compared with the traditional school context in which true interactions are scarce, digital technology provides a way to communicate with native speakers via online resources, supporting Soetaert and Bonamie's [20] assertion that the best way to learn a language is through interaction with native speakers, real interaction, and the use of the natural language in real communicative situations. Consequently, technology use can enhance authenticity using videos and internet communication [4]. It delivers dynamic language instruction with a virtual environment of video and audio materials and realistic conversation possibilities with native speakers, enhancing students' language proficiency.

2.3.4. Motivation and Confidence of Students

Numerous studies demonstrate that students appreciate utilizing technology to study a foreign language and prefer it to more conventional techniques and resources [18]. As a result, incorporating TELL activities enables teachers to take advantage of students' interests and include fun activities in a CLIL class (e.g., adolescents enjoy working with their peers). Additionally, it implies that teachers can create personalized curricula employing teachings that reflect local culture and educational philosophy [2], which is also aligned with the components of designing bridging materials in CLIL: L1, local languages and culture, and multimodality, which play a significant part in CLIL [21].

Additionally, technology can also lessen learners' anxiety by fostering an accepting, autonomous learning environment [22]. For instance, Fontecha [23] suggests that teachers consider using the proposed idea of CLILQuests for in-class or out-of-class work. As a result, TELL not only is an effective teaching strategy that can resolve the conflict between the lack of teaching time and the demand for students to learn additional material or consolidate their prior knowledge, but also creates an online interactive communication environment to provide learner-oriented opportunities to foster students' independence and relieve them of some of the pressures of traditional classroom learning.

Moreover, intelligent tutor feedback is more efficient than conventional feedback. Intelligent tutor systems imitate a tutor by delivering direct, individualized teaching and/or feedback to a student. Typically, such a system consists of four components: an interface (platform), an expert model (domain of knowledge the student is intended to acquire), a student model (current state of student's knowledge), and a tutor model (which provides feedback and instruction based on the identified gaps between the student and the expert models) [11]. Therefore, technology can boost students' motivation by providing them a more prominent role, allowing for self-evaluation and feedback. However, even though most intelligent tutors' feedback is timely due to the development of network technology, this does not mean that the evaluation system of online education is complete. According to Fontecha [23], they are awaiting actual implementation and classroom action research that can provide feedback on its validity and suggest the replacement and improvement of its defective parts.

2.4. How Is CLIL Teaching Being Practiced Using Online Learning Environments?

2.4.1. The Platform for Conducting CLIL Online Classes

The primary characteristic of distance education is its self-directed and learner-controlled learning activities, in which students take charge of their education and keep track of its pace and development without teacher–student interaction [24]. First, considering the delivery mechanism of CLIL online classes, Yang and Yang [25] indicates that the vast majority of available distance or online CLIL courses are based on the MOOC (massive open online courses) paradigm and are geared towards elementary or secondary school students. For instance, De Waard and Demeulenaere [26] created a MOOC–CLIL project to help fifth-grade students build learner autonomy, while Titova [27] researched higher education that combined a MOOC course with the CLIL methodology.

However, additional lecture styles are being merged with CLIL online classrooms due to technological advancements. For example, in a survey conducted by Bonner, Lege, and Frazier [28], university professors work 8-week CLIL courses in VR using a multiuser VR language learning platform. Overall, with the development and innovation of technology, the teaching methods used in CLIL's online courses are generally becoming more and more diverse. However, Florini [29] and James and Gardner [30] warn that distance learning can only be successful and efficient with a suitable electronic delivery system that accommodates various learning styles. Thus, the instructional design of CLIL online courses is more significant than the platform used.

2.4.2. TELL Activities in CLIL Online Class

First, there need to be strict criteria for instructors in technology implementation. The effectiveness of TELL depends on instructors' ability to interpret and integrate the use of digital technology applications into their courses. For instance, Meyer [16] suggests that teachers should ensure that the outcomes of group projects are distributed to the entire class (through posters, blogs, learning diaries, websites, etc.).

Therefore, according to Verduin and Clark [31], a sound instructional design should incorporate entry behavior assessment, behavioral objectives, learning unit and process specification, learning unit and task presentation, and student performance assessment. In addition to the course design framework, classroom activities form the course framework's content and, to a certain extent, influence the rationale of the course's design and its learning effectiveness. Since TELL activities are characterized by providing input, output, and opportunities for interaction, Walker and White [2] acknowledge that TELL-related activities could function as CLIL online class activities. They claim that teachers can accommodate students with various needs and preferences by integrating TELL activities to further the learning objectives in the coursebook. In addition, they provide specific examples of how TELL can support these multiple aspects of language learning, which can also be implemented in an online CLIL classroom. For example, in terms of repetition and memorization, Walker and White [2] suggest using the repeat button on embedded video or audio podcasts to listen to the content again if it needs to be wholly understood the first time. In addition, from an input standpoint, the authors recommend adding pictures to a spoken or written text to clarify its meaning. Regarding the output, they recommend creating a short video with MovieMaker and uploading it to YouTube. As for the interaction aspect, they advise collaborative projects, such as wikis, podcasts, and the creation of digital storybooks.

As a result, TELL can be utilized for a CLIL online classroom activity, as it provides a wide range of media materials, which is consistent with the first process in a curriculum cycle called the Multimodalities–Entextualization Cycle (MEC) proposed by Lin [21] for designing bridging materials in CLIL (Figure 1).

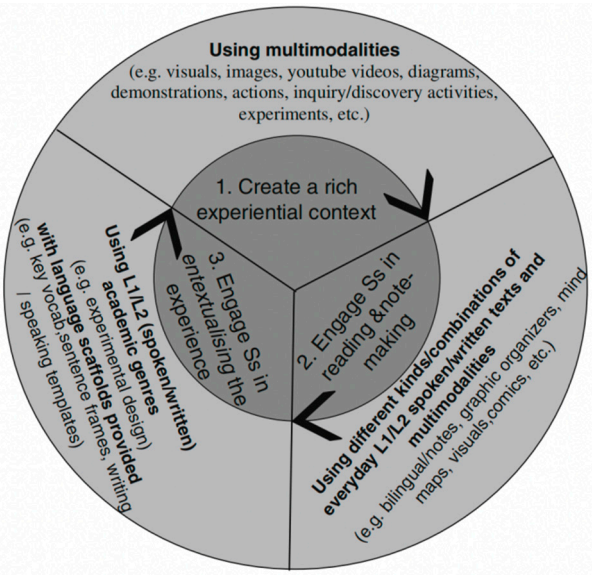


Figure 1. Multimodalities—Entextualization Cycle (MEC). Reprinted with permission from Ref. [21]. 2016, Lin, A. M. Y.

2.4.3. The Gap between CLIL Online Class and TELL

As Ni [32] mentions, CLIL is an underexplored educational approach in terms of the learning efficacy of distance education. This is demonstrated in the fact that there is insufficient literature available to investigate the integration of TELL and CLIL online teaching, while literature on CALL and CLIL integrated learning is more widely available.

However, the studies on CALL and CLIL-integrated classes generally discuss the role and impact of various technologies in the classroom. Little literature connects technology as a language-use environment, which is proposed by Warschauer and Kern [12] as the main characteristic of TELL. Furthermore, while there is a partial discussion of the literature regarding CLIL's online classes, the authors do not contribute to TELL research by correlating the technological environment of CLIL's online classes with the term TELL. For example, T-CLIL is a new word proposed by Adipat [33] that blends technology-enhanced content and language-integrated learning instruction. Although T-CLIL appears to be related to TELL and CLIL, the authors did not elaborate on it further in the paper. As a result, this research highlights this gap in sufficient elaboration. In order to contribute to addressing this gap, a study was undertaken into the learning results and challenges encountered in CLIL online classes that integrate TELL's delivery platform and classroom activities.

3. Research Questions and Objectives

In order to address the research gap that has been outlined in the previous section and which will be further detailed in the literature review below, the research that was undertaken as part of this research was constructed around two key research questions.

Question 1: How do CLIL teachers who teach CLIL online through TELL pedagogical designs perceive and evaluate this format of teaching?

Question 2: How does the combination of TELL and CLIL in an online learning environment affect the efficacy of teachers?

By exploring the answers to the two research questions, the general objectives of this investigation can be achieved, namely, to explore CLIL teachers' perspectives on CLIL and TELL integrated teaching and analyze their practical feedback to produce recommendations for effective means to advance this field. Therefore, two specific objectives have been set in this research:

Objective 1: To assess the related changes and challenges of the teaching methods during the implementation of online CLIL teaching.

Objective 2: To find the possible solutions to the teaching challenges by analyzing the diverse feedback from teachers and relevant literature.

4. Methodology

4.1. Research Approach

The researcher employed a qualitative research for the current study. Qualitative research is aimed at understanding social phenomena from the perspective of human participants in natural settings [34]; thus, qualitative research is the best method for analyzing teachers' responses regarding the advantages and disadvantages of integrating TELL into the CLIL teaching mode, as well as suggestions for improvement. The researcher conducted a semistructured individual interview using a sample of 10 local teachers and 10 foreign teachers from an established CLIL international secondary school in mainland China. The individual interview questions contained three sections: (1) teachers' perspectives of CLIL, (2) teachers' perspectives of TELL, and (3) teachers' perspectives of TELL and CLIL integrated teaching. The interview lasted about an hour and was conducted in Chinese (for local teachers) and English (for native English teachers). Teachers were asked about the benefits and drawbacks of the adoption of TELL teaching resources for CLIL teaching that has occurred in their individual experiences, as well as suggestions for improving it.

Video recordings were used to obtain and evaluate qualitative data in order to better comprehend teachers' viewpoints. Furthermore, all interview data were transcribed into English. The researcher summarized five themes using thematic analysis [35] and addressed each theme in turn. In the following section, several design aspects are addressed and elaborated upon, including the instruments and methods used for data collection and data analysis.

4.2. School Context

Twenty teachers from the primary and junior departments of an international private K–12 school in mainland China were selected as samples depending on their accessibility and availability. Although more participants would have given greater variation and generalizability, it is vital to highlight that "sample size may also be restricted by cost in terms of time, money, stress, administrative support, the number of researchers, and available resources" [36].

The school utilizes instructional materials in English. Among all the subjects, mathematics, science, and physical education have been selected as CLIL subjects taught in English. Under the CLIL program described above, when the foreign teacher teaches in English online on Zoom (an online delivery platform), the Chinese teacher of each class also functions as a subject assistant and translates part of the academic vocabulary during the course. This is because, although students' English ability is relatively high in this school, they are limited to proficiency in daily conversation. Their accumulation of academic vocabulary still needs to improve, necessitating the occasional need for a teacher's translation explanation. Although some scholars argue that it appears to be an established normalizing mission to keep L1 (the first language) out of the classroom environment when L2 (the second language) is being learned, other researchers have also presented diverse perspectives. There are numerous advantages to utilizing L1 strategically in CLIL. For instance, Laupenmhlen [37] notes that students automatically draw on their L1 resources when they meet second-language activities and concepts. Rather than avoiding L1, it is productive to encourage teachers to value learners' L1 resources and to make conscious judgments about using L1 in the classroom. Hence, this school does not abandon the role of the first language entirely within the CLIL curriculum. The Chinese teachers occasionally translate and clarify the areas of confusion for the students in their native tongue while assisting the lecturers in maintaining classroom discipline or facilitating classroom activities.

In addition, the online course was taught using a PowerPoint generated by the teachers based on the textbook and the software provided along with the textbook, which includes videos, music, and games. Despite having some resources already suitable for online learning, the content of the software supplied in the textbook needs to be revised to support online classroom activities; hence, teachers frequently need to seek out extra online resources on their own.

4.3. Instruments

The researcher conducted a semistructured individual interview using the sample of 20 teachers mentioned above. Teachers were interviewed separately via online video call by the researchers. The interviews lasted between 30 min to 1 h, and were conducted in Chinese (for native Chinese instructors) and English (for native English teachers). They were also digitally recorded to assist in analyzing answers after the interview. The interview was semistructured, with three sections, each including 10 questions. The first part of the study examines instructors' understanding of CLIL pedagogy, teaching impacts, implementation issues, and their views on CLIL. This helps answer the first research question by comparing teachers' perceptions of CLIL before and after implementing an online CLIL course. The second portion discusses the viewpoints of teachers on TELL in terms of online teaching materials, implementation impacts, and its advantages and disadvantages. Teachers' perspectives on the use of TELL to assist CLIL online instruction are discussed in the third section, which includes CLIL and TELL integrated implementation techniques, utilized teaching resources, student behaviors, and teaching effectiveness. Therefore, the majority of the interview questions focused on instructors' perspectives on the advantages and disadvantages of the new online CLIL teaching mode, as well as suggestions for enhancing this combined mode of CLIL and TELL education.

5. Analysis of the Data Collected

Via online video call, semistructured individual interviews with each participant were conducted. The interview was captured on camera and subsequently transcribed into text. The researcher conducted thematic analysis on the interview transcripts to determine the instructors' perspectives, knowledge, experiences, and values. The thematic analysis procedure consisted of six steps, including familiarization, coding, generating themes, reviewing themes, defining, and labeling themes, which were adapted from Clarke, Braun, and Hayfield [35].

As a result, for the first step, known as familiarization, the researcher read the material and took initial notes to become acquainted with the interview topic. The second step consisted of coding, which involves highlighting portions of the text to form abbreviated codes that explain the content. Therefore, the researcher developed a number of codes, including uncertainty, distraction, difficulty, student-centered, and severe weight, among others. The next phase was to generate themes; thus, the researcher summarized five themes before addressing each one in turn. The researcher then completed steps 4 to 6, which include reviewing themes, identifying and labeling themes, and writing up the findings.

Theme 1: Positive students' performance, as shown in Figure 2.

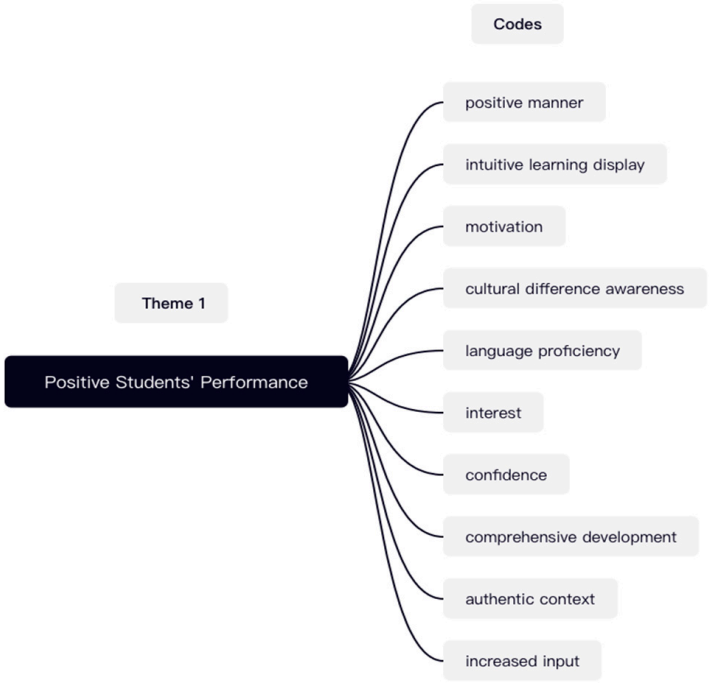


Figure 2. Theme 1.

The majority of teachers viewed the performance of students in CLIL and TELL-integrated classrooms favorably. For example, in Question 24: "How are students' reactions during the class?" teachers provided five viewpoints on how technology enhanced student performance. Initially, it was believed that the utilization of TELL teaching materials caught students' attention because it offered more intuitive learning benefits and more educational resources. As some interviewees replied, "Yes. Videos can show the topic directly and can draw students' attention", or "Yes. It will make the class diversified, get all the students more interested in the tasks. Help you attract their attention easier". Second, TELL improved knowledge input and memory retention in the form of multimodal materials, such as video and audio, and many interviewers affirmed this; for example, a teacher mentioned, "By using some interesting video clips or songs to get students motivated and try to sing or chant or read after the video clips or songs. They will quickly respond and think about the materials when they think about the knowledge".

In addition, a teacher recognized, "I think from a student's point of view the online CLIL and TELL-integrated class can improve confidence. It is not as 'scary' to answer questions as it can be in class if they are shy". Therefore, TELL facilitated authentic and successful communication with native speakers by providing the option to communicate with them online, allowing students to improve language skills and gain confidence in their English-speaking abilities.

The fourth objective was to make the original repetitive exercises as engaging as possible in the form of games in order to inspire students' passion and entice them to participate in the exercises. In accordance with the "Culture" part of the 4Cs framework's expectations for CLIL, online tools, such as travel films and three-dimensional global maps, make it easier to learn about the cultures of different countries [38]. Therefore, as one of the participants noted, "Students' attitudes can go both ways, of course, but usually in a positive manner".

Theme 2: The side effects on students, as shown in Figure 3.

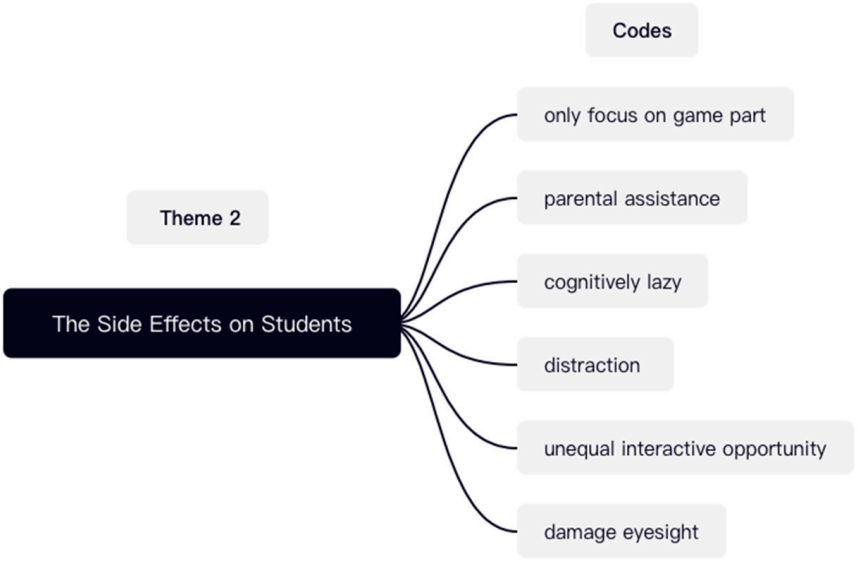


Figure 3. Theme 2.

When teachers were questioned, "Do you think TELL has any disadvantages?" and "What are the students' responses throughout class?" most teachers could identify at least two unfavorable features of integrated instruction. The researcher found six negative aspects as a result. First, regarding physical health, one interviewee said that "some parents may not encourage a significant amount of TELL learning, which will negatively impact children's concentration and eyesight". Therefore, online instruction may negatively impact students' eyesight, causing some parents to be anxious and dissatisfied. Second, in terms of learning outcomes, some teachers mentioned that the number of class interactive opportunities was reduced because online interaction increased the reaction time that it took for students to respond by using electronic devices to answer; consequently, there were fewer opportunities for interaction in the limited time available for lessons in comparison with offline lessons. In addition, pupils were easily distracted, mainly because they focused on engaging activities rather than the core teaching component. As a final point, some teachers stated, "I think an over-reliance on digital technology will erode the ability for students to learn without it, which can have many disadvantages as they get older and must learn more independently", so reliance on online resources can also create a degree of cognitive laziness, which was also highlighted by another teacher: "I find technology can make students lazy in some aspects".

Theme 3: Positive impacts on teachers, as shown in Figure 4.

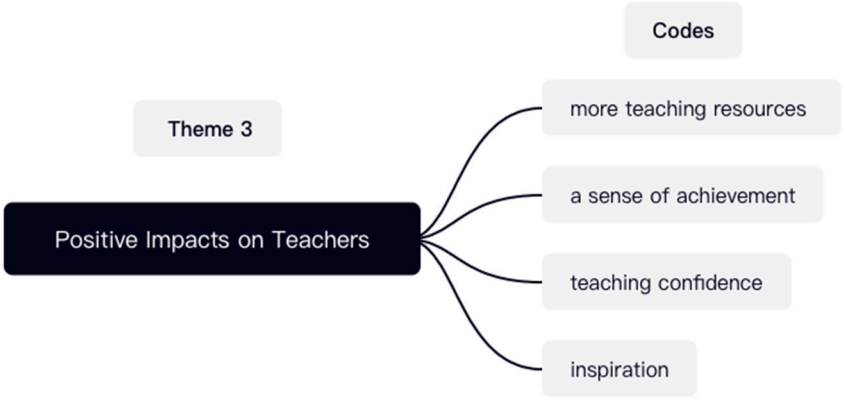


Figure 4. Theme 3.

The majority of interviewees had a positive view of the influence of CLIL and TELL integrated teaching on teachers, and they believed that not only did students benefit substantially from integrated teaching, but so did teachers. Therefore, four advantages described by teachers can be summarized as follows: The first point is that the decentralized nature of online resources means that most teachers need to integrate and adjust online resources according to the characteristics of their own classroom students' learning abilities. Although this adds to the teachers' working load, many of them also mentioned that they gain a sense of achievement as a result: "It is very satisfying when you make it", or "I enjoy it because I know my students will benefit and I know I can make it exactly to match my content".

Second, by integrating the teaching resources themselves, it also allows teachers to become more familiar with the teaching materials, which also increases their teaching confidence. Third, sifting through teaching materials on the internet gives teachers more inspiration. For example, one teacher mentioned, "I get a lot of inspiration online, so this helps me to plan my class more creatively". The final reason, which several respondents also noted, is that TELL provides a wide range of educational tools. For instance, one interviewee mentioned the technology she uses during the online CLIL class: "Usually, if it is software, it will be provided by the school or institution you work for. Besides that, I like to use YouTube for music and Pinterest for art and teaching ideas. There are apps like Duolingo that benefit older students". Moreover, another teacher also mentioned that the students have benefited from the various digital games: "An interesting game that uses language or drilling is effective. Even something like matching pictures to words—on a screen—is better than on a table or the floor. We live in a world surrounded by technology, so implementing it stimulates interest and helps students learn faster".

Theme 4: Implementation challenges, as shown in Figure 5.

The pedagogical obstacles faced by instructors can be categorized into four categories: teaching resources, teacher collaboration, teaching equipment, and teaching strategies.

The first obstacle was in the field of teaching resources. According to one interviewee, the dispersed nature of online resources made it difficult to find teaching materials that were ideally suited to their needs, and there was no clear framework for organizing them, so teachers were forced to search for, design, and rearrange them themselves, thereby increasing their workload.

The second challenge area is teacher collaboration. One interviewee noted that "collaboration between teachers is most frequently observed during lesson preparation, rather than lecture delivery or post-lecture reflection. Therefore the degree of collaboration is limited". After CLIL courses were converted to online courses, the absence of face-to-face communication due to the limitations of the communication software meant that some teachers did not have good collaborative relationships with other teachers; particularly the relationships between foreign teachers and Chinese teachers were susceptible to culture clashes. For instance, one interviewee admitted, "Chinese teachers are more concerned with the correctness of students' oral and written expressions, whereas foreign teachers are more

concerned with encouraging students to talk and whether they can convey what they want to express, which might lead to disagreement". Therefore, online teacher collaboration and communication is also a significant barrier for online education.

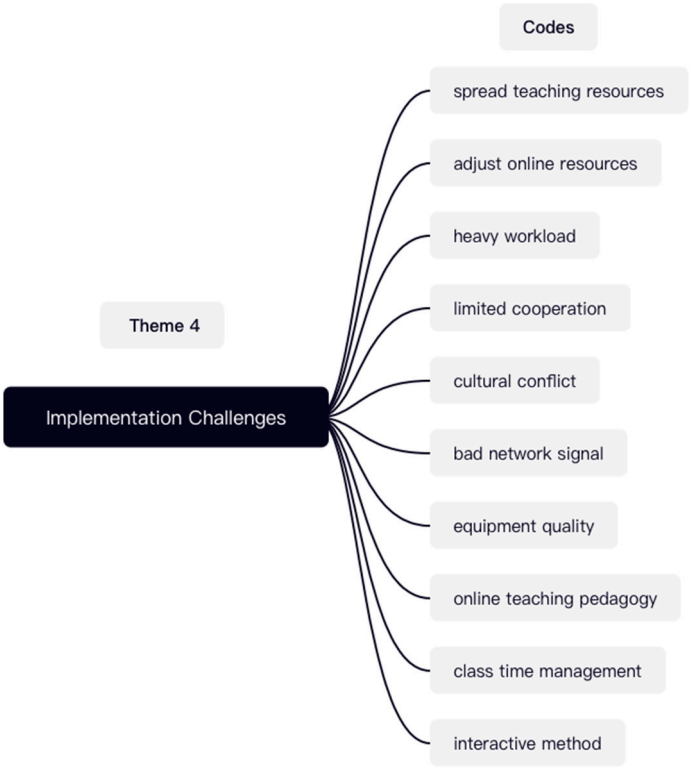


Figure 5. Theme 4.

The third area of difficulty is teaching equipment. Multiple interviewees indicated that online teaching is affected by instructional equipment and signals, such as "The digital technology itself can be slow and not work well sometimes", or "The network equipment causes a delay, making it impossible to monitor students' performance and provide timely comments as you could in an offline session. Also, it takes longer to respond to questions owing to the equipment". This indicates that the quality of hardware equipment can substantially impact the success of online course delivery, which is also aligned with the conclusion drawn by Pham et al. [39] about the vulnerability of online courses to the adverse effects of electronic devices, such as unreliable internet connections and excessive screen time. Another issue is that many students require parental assistance to complete online courses, as one of the teachers pointed out: "Younger students cannot access the phone while parents are not home", suggesting that a student-friendly and simple interface is essential to the success of online teaching, as parents cannot be with their children all day to give technical guidance during the courses.

The fourth area of difficulty is instructional strategies. Some interviewees mentioned, "Start small. Do not incorporate all your resources right from the start". In the meanwhile, another interviewee mentioned that it is essential to start with simple lessons and mix in activities they are already familiar with to help students adjust to online teaching because it differs from offline classes. Teachers cannot visually observe students' understanding through their facial expressions. Therefore, teachers should provide students with straightforward, clear directions and examples of how to react to help students complete the practical tasks during the class.

Furthermore, teachers should also be careful of time management during the class since several teachers pointed out, "It takes longer time to do activities during an online class"; "Students also spend more time answering questions because of the equipment";

"Consider classroom time management carefully", which all illustrate that the online responses from students can take longer and are much harder to manage.

Theme 5: Areas for improvement, as shown in Figure 6.

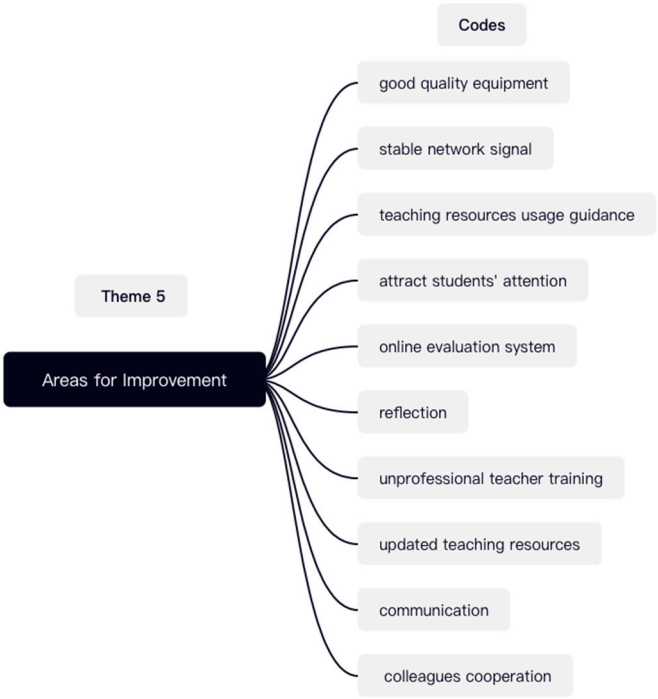


Figure 6. Theme 5.

Aspects that need to be improved are also divided into four aspects: online teaching equipment, online teaching methods, online teaching evaluation methods, and teacher training.

First, regarding the aspect of teaching equipment, the majority of teachers indicated that these tools have a significant impact on the effectiveness of online instruction. For instance, one interviewee claimed that "the digital technology itself can be slow and not work well sometimes, and when using the board, it can be easy for some students to lose focus unless something is exciting on the board. Otherwise, it is easy for them to look away". Therefore, it shows that the network's stability will impact the teaching's fluency, and students' learning effectiveness will be impacted by the network's stability. The classroom's ability to foster interaction will depend on how well versed teachers and students are in the features of the software. As a result, online learning is heavily dependent on the quality of the teaching tools; there is a greater need for teaching equipment.

Furthermore, teachers' teaching strategies should put more emphasis on how to grab students' attention and keep them engaged in the lesson because there is not any face-to-face interactive teaching in online courses, as one teacher complained, "Online courses do not offer more accurate and quick feedback on students' behavior since usually there is a delay due to the signal, which is quite different from observing students' performance and getting immediate feedback as teachers would in an offline class". It proves that it is difficult for teachers to observe students' listening status through video footage promptly and visually. There are times when students become preoccupied, such as when the session is overly lengthy or when they lose focus with the less engaging portions of the lesson. You can use videos and other introduction topics to engage students at the start of the course because the beginning of the course is also a time when they tend to be less attentive, according to the interviews conducted. As a result, the pedagogy of the online CLIL classroom demands the instructor to organize lessons in a more structured way. In order to accomplish the teaching goals, it is also crucial to blend attention curves, which are an "inverted U-curve" model to explain changes in human attention [40], and set up multimedia or group activities to grab their interest when they tend to be unfocused and

deliver the course's primary material while they are paying attention. The impact of online education can be maximized by combining the concept of students' attention curve to prevent the characteristics of online education that students are easily distracted.

In terms of online teaching evaluation, not only do many teachers mention the lack of mechanisms to test the effectiveness of teachers' online teaching, such as the absence of corresponding online quizzes to test students' learning effectiveness as a side effect of teachers' online teaching, but some scholars also strongly supported that an evaluation section should be included in the structure of the CLIL online class [23].

Regarding teacher training, the majority of teachers who were interviewed not only indicated that their teacher training lacked professional training and resource provision in terms of online education, but also that offline teacher training was ineffective. For instance, one interviewee stated, "Teacher training mostly started with theory and ended with practical exercises. However, the training lacked a discussion process, and there was only lecturing without any interactive discussion".

Another teacher complained, "Demo-teaching is not real, but is artificially acted out for the students". Therefore, some teachers suggested that since real students' reactions would be more realistic, it would be preferable to incorporate actual students in the training by having them attend the session and have other teachers observe. Hence, teacher training could attempt to transform the acting into real teaching. Students in a real classroom may not be as cooperative as adults, as it is impossible to foresee their actual behavior. In addition, one foreign instructor admitted, "I did a six-month in-person TEFL training course", which also unveils that most foreign teachers in this school only have TEFL (teaching English as a foreign language) training. Therefore, CLIL teacher training is a crucial area in need of improvement since it influences the efficacy of CLIL teaching and learning both online and offline.

Summary of Data Analysis

In summarizing the analyses of the data detailed above, two conclusions were derived, which are stated as follows:

1. Integrating TELL into CLIL online teaching to form a triple learning approach, formed of content, language, and technology, will bring comprehensive benefits to achieve CLIL dual-focused teaching objectives, since TELL can play a bridging role to integrate subject knowledge and language skills.
2. Integrating TELL into CLIL cannot guarantee good learning outcomes from students without the proper teaching resources and evaluation system of teaching effectiveness to ensure students' knowledge absorption and understanding in CLIL online teaching contexts.

6. Discussion of the Results

This section will synthesize the previous sections into a final discussion concerning the issues that this research has addressed. First, by comparing the conclusions drawn in the previous section with the existing literature, the findings of this research will be evaluated in terms of the existing academic literature reviewed previously, its consistency with previous findings will be judged, and contributions to the academic literature that can be drawn from this research will be put forth. Finally, the general limitations of this research will be discussed, and suggestions for further research will be offered.

6.1. Comparison of the Results with the Existing Literature

Regarding the first general conclusion (integrating TELL into CLIL online teaching to form a triple learning approach that benefits CLIL), it appears to be in agreement with the majority of the literature, as numerous authors note that TELL techniques tend to induce a variety of benefits in CLIL course settings. For instance, Pastor and Sanz [41] view their CLIL and TELL integrated teaching activities in the classroom as a threefold approach that integrates content, language, and technology, providing students with the

most useful and cutting-edge tools for the assimilation of new concepts and knowledge in the shortest time possible. In addition, Nieto Moreno de Diezmas [42] argue that new technologies provided by TELL appear to be more integrated in the CLIL classroom than in traditional education, as they are used to promote understanding of concepts conveyed in a foreign language, to enhance the knowledge acquisition, and to provide opportunities to build online collaborative work and student-centered activities. In addition, Scott and Beadle [11] conclude that CLIL and TELL integrated learning can enhance the language learning efficacy of learners.

Consequently, Warschauer [12] note that one key benefit of "hypermedia" (computer technology) is that it supports a primary focus on content without giving up a secondary focus on language form or learning procedures, which motivates many educational efforts to seek a more integrated approach to teaching. Many educators attempt to integrate TELL and CLIL hybrid teaching models in the hopes of more effectively achieving the dual teaching goals of CLIL because TELL software can be designed with a dual focus on language and a specific subject for a more dynamic approach to learning and practicing a language or subject. As a result, the first conclusion of this study is consistent with what the majority of the literature mentioned that CLIL and TELL integrated teaching will bring comprehensive benefits to CLIL classrooms. However, it is also slightly different from the majority of conclusions found in the previous literature, in that it emphasizes the use of TELL more and clarifies its role and potential in connecting subject goals and language goals, helping CLIL achieve dual-focused teaching objectives.

Regarding the second conclusion (without proper teaching resources and assessment systems, integrating TELL into CLIL does not guarantee good learning outcomes for students), the quantity of related literature is significantly less than for the first conclusion. Some literature raises the issue of the lack of an online CLIL assessment method; for example, Fontecha [23], who proposed the CLILQuest model, also emphasizes that an evaluation section should be included in the structure of CLILQuest. However, no significant research has been found to specifically address this issue, with the exception of Yang and Yang [25], who adopted a mixed methodological framework, analyzing online questionnaire data and interviewing students, to form an evaluation method for the effectiveness of online CLIL teaching. However, this is not a direct and effective online CLIL assessment method that can be applied to every TELL and CLIL integrated teaching classroom.

6.2. Suggestions for Improving Online CLIL Teaching

Through the investigation and analysis of this research, it is concluded that the challenges that teachers encounter in teaching online CLIL courses originated mainly from the lack of TELL and CLIL integrated teaching resources, the lack of an online CLIL course evaluation system, and the lack of training for online teaching, which can help teachers to be familiar with accessing and using online teaching resources. Hence, by comparing and combining the findings of this research and previous literature, it is possible to suggest some solutions to these issues.

6.2.1. The Lack of TELL and CLIL Integrated Teaching Resources

Some interviewees noted that there was a lack of communication among colleagues regarding teaching resource sharing, which led to a lack of collaboration among colleagues. Additionally, there was no organized system for teachers to upload the teaching materials they had created as a way of sharing teaching materials collectively to lessen workload and increase efficiency. One means of solving these issues is suggested by Pokrivčáková et al. [1], who list a number of software programs that can be used for CLIL online teaching, including 17 software programs for teaching mathematics, 5 software programs for teaching science, 7 websites that can be used in CLIL teaching, and 16 software programs that can be used to design CLIL classroom activities. Pokrivčáková et al. [1] also suggest that these resources can be acquired by school administrators and shared with all relevant teachers through cloud-based storage. Since teachers have a heavy teaching load,

this solution would free teachers from having to search for their own resources and would benefit the ability of teachers to plan classes effectively, collaborate, and share impactful ideas. Concurring with this suggestion, these data from this research also highlight the benefit that could be made to CLIL teachers via the provision of quality software programs and other online resources that could be made more easily accessible to all teachers by school management.

6.2.2. The Lack of an Online CLIL Course Evaluation System

The results of students' online learning differ from person to person, according to the majority of interviewers. Some students are effective learners who consequently continue to study effectively in online classes, while undisciplined students perform worse. However, when asked how they came up with their evaluations of their students, most of the interviewers gave subjective answers, with many basing their formative evaluation [43,44] on the way the students responded to questions in class and how they behaved in class. Only a few teachers included summative assessments, such as classroom exams, to evaluate students learning outcomes more objectively, and parent communication to know students more comprehensively. However, most instructors agree that a more structured and logical method to evaluate how well students are learning in online classrooms is still lacking, especially if they just transfer the offline exam paper into digital versions to act as online exams, which do not match the online class features. Consequently, in order to fill the evaluation system's gap, based on existing literature, Fontecha [23] proposes the CLILQuest model by adapting WebQuest. WebQuest is a method for making good use of web resources in teaching and learning, guiding students to sift through the information available on the web and then integrate, analyze, and provide their own opinions. In general, a complete WebQuest can be divided into six components, which are summarized by Dodge [45] below.

Introduction: an introduction to the motivation and contextual guidance for learning.

Task: a description of the student's assigned task, including learning objectives, etc.

Process: an organization and guide to the exploration process.

Resources: links to websites or other resources.

Evaluation: description of the requirements for completing this task and how it will be graded.

Conclusion: description of the meaning of completing this study, which may suggest new questions or additional links and provide opportunities for extended learning.

Fontecha [23] designed CLILQuest based on the same structure of WebQuest described above. Although she claims that an evaluation component should be included in the structure of CLILQuest, her model lacks an evaluation section due to the germinal stage of the proposal, meaning they had not yet developed one at the time of publication. She proposes CLILQuest primarily as a preclass online task, which would be completed prior to the CLIL class or as a classroom activity. However, CLILQuest could also be turned into a web-based evaluation system for CLIL courses by simply changing the context in which it is used. For example, CLILQuest could also be used as an after-class exercise. For example, after teaching about climate change, the teacher uses the WebQuest website to set up an introduction to climate change, including tasks relating to real cases of global warming in the world, offering an after-class assignment for student assessment purposes.

The proposed idea of CLILQuest, adapted from the website WebQuest, has great plasticity, with potential use as a prestudy before the class, a classroom activity during the class, or even an evaluation method after the class. The difficulty of the CLILQuest could be changed depending on which role the CLILQuest is designed to fulfill, meaning that it could be used as an effective postclass method of evaluation. CLILQuest is therefore one possibility for solving a key problem elucidated by both this research and previous literature, that CLIL online teaching needs a well-developed evaluation system.

6.2.3. The Lack of Effective Training for CLIL Online Teaching

Many of the teachers interviewed were dissatisfied with the CLIL teacher training they received, in part because most of these trainings were organized by the schools themselves and lacked systematic teacher training organization. For instance, one Chinese teacher interviewer concluded, "Most teacher training begins with theory and ends with practical exercises. However, the training method is lacking innovation, consisting mainly of indoctrination and acceptance, not to mention the absence of a section on how to teach online classes in teacher training". Therefore, CLIL teacher training in this local school appears to be relatively superficial and ignores teachers' actual needs. Meanwhile, interviewees admitted that a lack of confidence in their English proficiency and ignorance of the CLIL teaching techniques are caused by the absence of a relevant component in the teacher training they received. In addition, the interviewees emphasized that there is a lack of guidance regarding online teaching, such as what teaching resources are available, how to fully utilize those online teaching resources, etc., which has created difficulties for teachers and increased their precourse preparation burden. Inadequate and unsystematic teacher training has resulted in teachers having to tackle many of the difficulties they experience in the classroom by themselves. Online classes, which separate teachers from students, have increased teachers' confusion and anxiety regarding the change in teaching methods. Overall, due to the lack of training for English proficiency, CLIL pedagogy, and CLIL and TELL integrated online teaching, this paper selects some of the useful training content mentioned by the interviewers and combines it with the clear structure of teacher training from the existing literature to create a rich and comprehensive teacher training proposal that is well structured to satisfy teachers' demands.

First, although the interviewees were from the same school, the majority of the instructors had prior experience in teacher training, having worked in other schools or institutions. Consequently, depending on the different responses of several interviewers, the following three processes were selected, adjusted, and summarized:

Stage 1: Language Training:

For the preservice teachers, they should finish these two sections:

1. TKT (teaching knowledge test) (modules 1–3);
2. TESOL (Certificate in English Language Teaching-Secondary).

Benefits: Instructors who participate in official language training will gain a more systematic understanding of the language as well as the confidence to improve the standard of classroom instruction and to use freshly learned teaching techniques to assist students to achieve their full potential.

Stage 2: English Language Teaching Training:

For the pre-service and in-service teachers, they need to finish:

1. CELT-S (Certificate in English Language Teaching-Secondary).

Benefits: CELT-S is a comprehensive teacher education program that seeks to assist instructors in enhancing their students' English education. It mixes online learning with live lectures and exams. It aims to improve instructors' knowledge and classroom skills while also supporting students in reaching the full potential of their English education.

Stage 3: CLIL pedagogy training:

1. TKT (CLIL module);
2. Weekly and quarterly meetings
3. In-school forum.

Benefits: By engaging in the TKT CLIL module, teachers received a comprehensive understanding of CLIL pedagogy and a clearer understanding of the duties and responsibilities of CLIL instructors. Additionally, when it comes to the necessity of setting the weekly and quarterly meetings, as one interviewee suggested, teacher training can increase the opportunities for in-service teachers to communicate with new teachers. In that case, it can balance the situations that new teachers have new ideas but lack teaching experience, while in-service teachers have more teaching experience but may lack new ideas. Therefore, the

school can create more collaborative opportunities for teachers by establishing weekly and quarterly school meetings, as well as in-school forums. Notably, the establishment of an official forum is also an efficient means of boosting teacher collaboration and idea exchange. As stated by Ball [46], teacher training can assist teachers in building and monitoring their professional CLIL abilities by establishing an official platform to expand teaching strategies that can subsequently be utilized in the classroom. For example, the cooperation among different subjects' teachers will activate the connection among different subjects' knowledge, which enables teachers to utilize the project-based learning technique to better break the boundaries of subjects, giving students a well-rounded classroom experience.

Second, as the majority of interviewees acknowledged the lack of systematic structure in the CLIL teacher training they received and the absence of training content in the CLIL online classroom, current literature suggests that schools can refer to the framework of Massive Open Online Courses (MOOCs) [47], which helps approximately 5000 trainees gain professional knowledge, professional skills, and personal development.

The structure of MOOC is clear and well organized, which can be divided into five modules, each lasting 1 week:

The first week consists of three sections: brainstorming, the introduction of the online course, and Moodle registration. As a result, the first week of CLIL is devoted to community training, familiarization with the workplace and technologies, and knowledge sharing among participants.

The second week is aimed at letting participants explore the potential of Web 2.0. Trainees in the CLIL sector are urged to directly find and play with tools, applications, and software, anticipating their direct usage in the classroom.

The CLIL pathway is at week 3. This module's goal is to give students a thorough understanding of the fundamentals of the CLIL curriculum while also allowing them to design and implement technologically assisted CLIL educational interventions that focus on the humanities or sciences according to their school's hierarchical structure.

The fourth week is devoted to reading. This week's goal is not just to read a lot; it is also to look for links between CLIL subject knowledge and language skills in language books.

The fifth week is spent building a CLIL resource library. It is week to build and enrich a digital library of materials, resources, lesson plans, etc., that can be consumed in a variety of teaching contexts, especially taking into account the latest innovations, such as the flipped classroom and bring your own device (BYOD). The creation process not only enriches teachers' knowledge of CLIL web-based teaching and learning resources, but also creates a database that facilitates practical teaching and learning.

Therefore, by combining insights from the interview feedback and previous literature, the above suggestions can be made for how to improve training for CLIL online teaching.

6.2.4. Limitations of the Results and Future Research

In addition to acknowledging the positive effects of TELL on CLIL teaching and highlighting the most pressing challenge of integrating CLIL and TELL teaching, namely, the lack of evaluation methods in this integrated teaching mode, the two conclusions of this study fill some gaps in the existing literature. The results of this study focus on highlighting the effectiveness of the current integration of TELL and CLIL instruction and some areas for improvement, as well as proposing potential remedies based on its findings and the existing literature.

However, this study was affected by some methodological limitations, one being that there was not enough available time and the sample size was insufficient to determine whether the potential solutions provided in this study would improve the TELL and CLIL integration outcomes. Consequently, some potential areas for future development are highlighted below.

1. Could an adaption of WebQuest to CLILQuest serve as one of the teaching effectiveness evaluation methods for the CLIL and TELL integrated class? How effective would it be for evaluating?

2. What is the influence of online and offline CLIL teacher training's implementation? How could it be made better?

7. Conclusions

This study offered some penetrating insights into the effects of the integration of CLIL and TELL through looking at CLIL online teaching. Partly due to the effects of the global epidemic and also due to the greater proliferation of digital technology, more and more schools are choosing to teach online or incorporate online teaching resources to supplement their classroom content. Although in this study, most teachers have a positive attitude towards the CLIL and TELL integrated teaching, most do not have a comprehensive understanding of this integration model, as they have limited knowledge of teaching resources and do not know how to intersperse multimodal teaching resources at the right time in the classroom, so most teachers do not fully realize the benefits of the integration of TELL and CLIL.

As all CLIL teaching environments will in some way be in the process of integrating CLIL and TELL teaching resources, the lack of a sound and efficient system for evaluating the effectiveness of teaching and learning is still a pressing issue. Therefore, to maximize the effectiveness of the integration of CLIL and TELL, and to help CLIL achieve the 'integration' effect, additional help and advice from academic research is needed to improve teachers' teaching methods and effectiveness and to reduce teachers' anxiety, confusion, and heavy workload. It is hoped that this work can contribute to this goal. The findings of this study support two conclusions that are of interest. First, through a recognition of the deep importance of understanding TELL in relation to contemporary CLIL online teaching, TELL can be conceived as a bridging element that can further integrate the dual elements of subject knowledge and language skills. Second, integrating TELL into CLIL cannot guarantee good learning outcomes from students without the proper teaching resources and evaluation system of teaching effectiveness to ensure students' knowledge absorption and understanding in CLIL online teaching contexts. It is further hoped that these two conclusions can stimulate further research and discussion on these topics.

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