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RESEARCH PAPER

Analyzing the Cognitive Skill Development of Second Language (L2) Learners through Content and Language Integrated Learning

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ABSTRACT

This study compares CLIL implementation beliefs between content and language teachers, evaluates secondary school students' comprehension using CLIL, and explores CLIL's significance in enhancing cognitive skills. Four private secondary schools in Gujranwala were selected for the research, using questionnaires and interviews for data collection. The study employed Coyle's 4Cs framework. Significant differences were observed between genders in language proficiency development, integration of content and language learning, improvement in critical thinking skills, and the broader implementation of CLIL programs in language education. The research concludes that a better understanding of effective teaching practices in CLIL programs emphasizes the dynamic nature of CLIL teaching, focusing on enhancing language learning experiences and promoting cognitive growth in L2 learners. The recommendations emphasize the importance of inclusive and student-centered approaches in CLIL programs to maximize the benefits for all learners.

KEYWORDS CLIL, Cognitive Skills, Coyle's 4Cs, Second Language, EFL, Integrated Language Learning

Introduction

Content and Language Integrated Learning (CLIL) is an approach that has gained significant attention in recent years due to its potential in fostering second language (L2) acquisition and cognitive skill development (Dalton-Puffer, 2013; Fortanet-Gómez, 2013; Lasagabaster & Sierra, 2010). CLIL refers to an instructional method where subjects such as science, history, or mathematics are taught in a second language, providing learners with opportunities to simultaneously develop their language proficiency and cognitive abilities (Coyle, Hood, & Marsh, 2010; Genesee, 1994).

Cognitive skills encompass a wide range of mental processes, including memory, attention, problem-solving, critical thinking, and creativity (Anderson et al., 2001; Colom, 2004; Sternberg, 1985). Research in the field of second language acquisition has shown that CLIL can positively influence the development of these cognitive skills in L2 learners (Bissonnette, 2016; Dalton-Puffer, 2007; Pérez-Cañado, 2012).

Several studies have investigated the impact of CLIL on L2 learners' cognitive skill development. For example, Dalton-Puffer (2007) found that CLIL students exhibited enhanced cognitive skills such as analytical thinking, hypothesis testing, and creative problem-solving compared to non-CLIL students. Similarly, Bissonnette (2016) observed that CLIL instruction improved L2 learners' critical thinking and reasoning abilities.

Moreover, research suggests that CLIL can have a positive impact on memory processes. Genesee (1994) conducted a study comparing the memory skills of CLIL and non-CLIL learners and found that CLIL students demonstrated better memory retention and retrieval in the second language. These findings align with the cognitive theory proposed by Anderson et al. (2001), which suggests that cognitive skills are transferable across domains, including language learning.

Furthermore, CLIL has been found to enhance L2 learners' attentional capacities. Lasagabaster and Sierra (2010) explored the effects of CLIL on attention and reported that CLIL students exhibited improved focus, concentration, and selective attention compared to their counterparts in traditional language instruction. Enhancing attentional control can have significant implications for L2 learners' overall cognitive development (Colom, 2004).

In addition to memory and attention, CLIL has been associated with the development of problem-solving skills. Fortanet-Gómez (2013) investigated the impact of CLIL on L2 learners' problem-solving abilities and found that CLIL students demonstrated higher levels of problem-solving efficacy and flexibility compared to non-CLIL students. These findings indicate that CLIL can enhance L2 learners' cognitive flexibility and adaptability in tackling complex tasks.

Since its European introduction in 1990, Content and Language Integrated Learning (CLIL) gained prominence, but full implementation remains challenging. A recent study by Iqbal (2022) identified a major hurdle in Pakistan: limited English proficiency (Jalal & Nawab, 2022). This study addresses CLIL challenges and benefits in secondary schools. Despite recognition for second language acquisition and cognitive skills, there's insufficient research on content vs. language teachers' CLIL beliefs and limited Pakistani student comprehension assessment. Additionally, CLIL's role in fostering cognitive skills requires exploration. This research aims to fill these gaps, providing valuable insights for improved CLIL implementation and second language instruction practices in secondary schools.

Literature Review

Content and Language Integrated Learning (CLIL) is an approach to second language acquisition that integrates language instruction with subject content. This method aims to enhance cognitive skill development in second language (L2) learners by providing meaningful and authentic language use in various academic disciplines. In the context of Pakistan, where English is taught as a second language, the implementation of CLIL has gained attention in recent years. This literature review critically examines the latest research conducted in Pakistan regarding the cognitive skill development of L2 learners through CLIL, highlighting the impact and effectiveness of this approach.

Iqbal and Khan (2021) conducted a mixed-methods research to examine the impact of CLIL on the cognitive skills of L2 learners in secondary schools in Pakistan. The findings revealed that CLIL implementation positively influenced critical thinking, problem-solving abilities, and creativity among the students. Ahmed and Malik (2022) investigated the effects of CLIL on L2 learners' vocabulary development in higher education institutions in Pakistan. The study concluded that CLIL significantly contributed to the expansion of learners' vocabulary and improved their retention of new words.

Ali and Khan (2023) explored the relationship between CLIL instruction and metacognitive awareness among L2 learners in primary schools in Pakistan. The study

demonstrated that CLIL facilitated the development of metacognitive strategies, such as planning, monitoring, and evaluating, leading to enhanced language learning outcomes. Mahmood and Haq (2023) conducted a quasi-experimental study to investigate the impact of CLIL on L2 listening skills in language institutes in Pakistan. The findings indicated that CLIL-based instruction significantly improved learners' listening comprehension abilities and their overall engagement in the learning process.

Khan and Ahmad (2022) examined the impact of CLIL on L2 learners' reading comprehension in Pakistani secondary schools. The study found that CLIL instruction positively influenced learners' reading skills, including comprehension, vocabulary acquisition, and overall reading proficiency. Nasir and Hassan (2022) conducted a case study investigating the role of CLIL in developing L2 writing skills among Pakistani university students. The results demonstrated that CLIL significantly enhanced students' writing proficiency, including their ability to produce coherent and well-organized texts.

Anwar and Raza (2021) assessed the impact of CLIL on L2 learners' speaking fluency in Pakistani language institutes. The study revealed that CLIL instruction positively affected learners' speaking skills, leading to increased fluency, accuracy, and confidence in spoken English. Haider and Shah (2022) investigated the impact of CLIL on L2 learners' grammar development in primary schools in Pakistan. The findings indicated that CLIL instruction played a significant role in enhancing learners' grammatical accuracy and knowledge of English grammar rules.

Khan and Ali (2023) explored the relationship between CLIL instruction and L2 learners' listening strategies among Pakistani university students. The study found that CLIL promoted the use of effective listening strategies, such as prediction, inference, and note-taking, leading to improved listening comprehension. Malik and Mahmood (2023) conducted a comparative study to examine the impact of CLIL on L2 learners' motivation in Pakistani schools. The findings indicated that CLIL instruction positively influenced learners' motivation levels, fostering a greater interest in language learning and increased willingness to communicate in English.

Despite the existing studies highlighting the positive impact of Content and Language Integrated Learning (CLIL) on the cognitive skill development of second language (L2) learners in Pakistan, there is a research gap specific to the context of Gujranwala. While the reviewed studies focused on primary schools and higher education institutions, there is a need for research investigating the effectiveness of CLIL in secondary schools in Gujranwala. Additionally, comprehensive research exploring the holistic impact of CLIL on overall language proficiency and communicative competence in the Gujranwala context is lacking. Furthermore, future studies could examine the effectiveness of different instructional strategies and materials used in CLIL classrooms in Gujranwala to identify optimal approaches for enhancing cognitive skill development in L2 learners.

Material and Methods

The present study employed a mixed methodology approach, incorporating qualitative and quantitative research methods. To investigate the development of cognitive skills and their influence on learners' academic writing abilities, a questionnaire was utilized as the quantitative aspect of the research. The study focused on secondary-level students and teachers from private schools in Gujranwala. Specifically, participants for the CLIL study were selected from four secondary schools

in the region: Science Locus, The Oxford School, Jadeed Dastgir, and Best School system. The number of students involved in the study varied across the schools. Science Locus had 29 female students and 1 male student, The Oxford School had 24 male students, Jadeed Dastgir had 14 female students and 10 male students, and Best School system had 18 female students and 4 male students. The research data was collected through convenience sampling, with willing candidates participating in the study. For the qualitative component, interviews were conducted with secondary school teachers who possessed a B2 level of English proficiency and were capable of teaching social science subjects. One teacher from each school took part in the study. The research design for this study employed the 4Cs framework, also known as Coyle's 4Cs framework. This framework centers around four key components: context, content, community, and cognition. By using this comprehensive framework, the study aimed to examine the impact of CLIL on the development of cognitive skills among L2 learners.

Data Analysis

Data collection in this study involved the use of questionnaires and interviews administered to students and teachers in selected secondary schools in Gujranwala. The collected data was carefully analyzed to address the research objectives, with a specific focus on exploring the relationship between Content and Language Integrated Learning (CLIL) instruction and the development of cognitive skills among second language (L2) learners. The analysis aimed to provide valuable insights while ensuring the reliability and validity of the data.

To provide a contextual understanding, the demographic details of the participants were presented. The data analysis primarily focused on quantitative analysis, utilizing Coyle's 4Cs framework, which encompasses the dimensions of cognition, culture, content, and communication. Each sub-section of the framework was individually examined to investigate the impact of CLIL instruction on the development of cognitive skills and its influence on various aspects of learning.

The analysis process involved employing statistical techniques, such as descriptive statistics, correlation analysis, and potentially independent sample t-tests, to assess the significance of the findings. Through this rigorous analysis, the study aimed to uncover meaningful insights into the interplay between CLIL instruction, cognitive skill development, and different facets of the learning experience. The results of quantitative and qualitative analysis are given below:

Results and Discussion

The quantitative analysis in this study is grounded in Coyle's 4Cs framework, which encompasses four sub-sections: Cognition, Culture, Content, and Communication. The first sub-section, Cognition, focuses on examining cognitive aspects related to CLIL programs. The second sub-section, Culture, explores the cultural dimensions and influences within CLIL contexts. The third sub-section, Content, delves into the integration of subject content and language instruction in CLIL programs. Lastly, the fourth sub-section, Communication, investigates the role of language and communication skills development in CLIL settings. By utilizing Coyle's 4Cs framework, this study provides a comprehensive analysis of CLIL from multiple dimensions, allowing for a deeper understanding of its impact on cognitive skills, cultural awareness, content integration, and language proficiency development.

Table 1
Cognition One-way Anova in terms of Gender

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
CLIL programs have helped me to develop my cognitive skills.	**Between Groups**	1.588	1	1.588	1.703	.195
	Within Groups	91.412	98	.933		
	Total	93.000	99			
I find CLIL programs more effective for developing my language proficiency compared to traditional language instruction	**Between Groups**	28.016	1	28.016	18.906	.000
	Within Groups	145.224	98	1.482		
	Total	173.240	99			
CLIL programs have helped me to integrate content and language learning.	**Between Groups**	2.287	1	2.287	10.800	.001
	Within Groups	20.753	98	.212		
	Total	23.040	99			
CLIL improve L2 learners' critical thinking skills?	**Between Groups**	22.005	1	22.005	24.300	.000
	Within Groups	88.745	98	.906		
	Total	110.750	99			
CLIL enhance L2 learners' problem-solving skills?	**Between Groups**	.020	1	.020	.214	.645
	Within Groups	8.980	98	.092		
	Total	9.000	99			

Table 1 presents the results of the One-way Analysis of Variance (ANOVA) conducted to examine the relationship between gender and various cognitive aspects related to CLIL programs. The table provides information on the sum of squares, degrees of freedom (df), mean square, F-value, and significance level (Sig.) for each cognitive skill.

The first row of the table shows the cognitive skills related to the development of cognitive skills through CLIL programs. The between-groups analysis reveals a sum of squares of 1.588, with 1 degree of freedom, resulting in a mean square value of 1.588. The F-value is 1.703, and the associated p-value is .195, indicating that the difference between genders regarding the development of cognitive skills through CLIL programs is not statistically significant.

The second row focuses on the effectiveness of CLIL programs in developing language proficiency compared to traditional language instruction. The between-groups analysis demonstrates a sum of squares of 28.016, with 1 degree of freedom, resulting in a mean square value of 28.016. The F-value is 18.906, and the associated p-value is .000, indicating a statistically significant difference between genders. CLIL programs are perceived as more effective in developing language proficiency compared to traditional language instruction.

The third row examines the integration of content and language learning through CLIL programs. The between-groups analysis reveals a sum of squares of 2.287, with 1 degree of freedom, resulting in a mean square value of 2.287. The F-value is 10.800, and the associated p-value is .001, indicating a statistically significant difference between genders. CLIL programs are perceived to aid in integrating content and language learning.

The fourth row explores the impact of CLIL programs on L2 learners' critical thinking skills. The between-groups analysis demonstrates a sum of squares of 22.005, with 1 degree of freedom, resulting in a mean square value of 22.005. The F-value is 24.300, and the associated p-value is .000, indicating a statistically significant difference between genders. CLIL programs are seen to improve L2 learners' critical thinking skills.

Lastly, the fifth row investigates the influence of CLIL programs on L2 learners' problem-solving skills. The between-groups analysis reveals a sum of squares of 0.020, with 1 degree of freedom, resulting in a mean square value of 0.020. The F-value is 0.214, and the associated p-value is .645, indicating that there is no statistically significant difference between genders regarding the impact of CLIL on L2 learners' problem-solving skills.

Table 2
Culture One-way Anova in Terms of Gender

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
I feel more motivated to learn the target language when participating in CLIL programs.	**Between Groups**	.803	1	.803	3.009	.086
	Within Groups	26.157	98	.267		
	Total	26.960	99			
I think CLIL programs should be implemented more widely in language education.	**Between Groups**	30.748	1	30.748	24.260	.000
	Within Groups	124.212	98	1.267		
	Total	154.960	99			
CLIL help L2 learners develop cross-cultural awareness?	**Between Groups**	.028	1	.028	.175	.677
	Within Groups	15.812	98	.161		
	Total	15.840	99			

Table 2 presents the results of the One-way Analysis of Variance (ANOVA) conducted to examine the relationship between gender and various cultural aspects related to CLIL programs. The table provides information on the sum of squares, degrees of freedom (df), mean square, F-value, and significance level (Sig.) for each cultural aspect.

The first row of the table focuses on the motivation of learners in CLIL programs. The between-groups analysis reveals a sum of squares of 0.803, with 1 degree of freedom, resulting in a mean square value of 0.803. The F-value is 3.009, and the associated p-value is 0.086, suggesting that the difference in motivation to learn the target language between genders in CLIL programs is not statistically significant.

The second row examines the participants' views on the broader implementation of CLIL programs in language education. The between-groups analysis demonstrates a sum of squares of 30.748, with 1 degree of freedom, resulting in a mean square value of 30.748. The F-value is 24.260, and the associated p-value is 0.000, indicating a statistically significant difference between genders. Participants believe that CLIL programs should be implemented more widely in language education.

The third row explores the impact of CLIL programs on the development of cross-cultural awareness among L2 learners. The between-groups analysis reveals a sum of squares of 0.028, with 1 degree of freedom, resulting in a mean square value of 0.028. The F-value is 0.175, and the associated p-value is 0.677, suggesting that there is

no statistically significant difference between genders regarding the impact of CLIL on the development of cross-cultural awareness.

Table 3
Content One-Way Anova in Terms of Gender

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
CLIL is effective in developing L2 learner's cognitive skills?	**Between Groups**	44.614	1	44.614	83.475	.000
	Within Groups	52.376	98	.534		
	Total	96.990	99			
CLIL contribute to L2 learners' creativity?	**Between Groups**	.020	1	.020	.214	.645
	Within Groups	8.980	98	.092		
	Total	9.000	99			

Table 3 presents the results of the One-way Analysis of Variance (ANOVA) conducted to examine the relationship between gender and various content-related aspects of CLIL programs. The table provides information on the sum of squares, degrees of freedom (df), mean square, F-value, and significance level (Sig.) for each content aspect.

The first row of the table focuses on the effectiveness of CLIL programs in developing cognitive skills among L2 learners. The between-groups analysis reveals a sum of squares of 44.614, with 1 degree of freedom, resulting in a mean square value of 44.614. The F-value is 83.475, and the associated p-value is 0.000, indicating a statistically significant difference between genders. CLIL programs are perceived as effective in developing L2 learners' cognitive skills.

The second row investigates the contribution of CLIL programs to L2 learners' creativity. The between-groups analysis demonstrates a sum of squares of 0.020, with 1 degree of freedom, resulting in a mean square value of 0.020. The F-value is 0.214, and the associated p-value is 0.645, suggesting that there is no statistically significant difference between genders regarding the impact of CLIL on L2 learners' creativity.

Table 4
Communication One-way Anova in terms of Gender

ANOVA						
		Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
CLIL improve L2 learners' comprehension of content-specific vocabulary?	**Between Groups**	.490	1	.490	2.342	.129
	Within Groups	20.510	98	.209		
	Total	21.000	99			
CLIL in facilitating L2 learners' memory retention of subject matter?	**Between Groups**	.380	1	.380	1.359	.247
	Within Groups	27.380	98	.279		
	Total	27.760	99			
CLIL promote L2 learners' engagement in class?	**Between Groups**	.214	1	.214	.569	.452
	Within Groups	36.776	98	.375		
	Total	36.990	99			
CLIL prepare L2 learners for academic success?	**Between Groups**	1.624	1	1.624	.620	.433
	Within Groups	256.486	98	2.617		
	Total	258.110	99			

CLIL enhance L2 learners' language proficiency?	**Between Groups**	.057	1	.057	5.950	.017
	Within Groups	.933	98	.010		
	Total	.990	99			

Table 4 presents the results of the One-way Analysis of Variance (ANOVA) conducted to examine the relationship between gender and various communication-related aspects of CLIL programs. The table provides information on the sum of squares, degrees of freedom (df), mean square, F-value, and significance level (Sig.) for each communication aspect.

The first row of the table focuses on the improvement of L2 learners' comprehension of content-specific vocabulary through CLIL programs. The between-groups analysis reveals a sum of squares of 0.490, with 1 degree of freedom, resulting in a mean square value of 0.490. The F-value is 2.342, and the associated p-value is 0.129, suggesting that there is no statistically significant difference between genders regarding the impact of CLIL on L2 learners' comprehension of content-specific vocabulary.

The second row investigates the role of CLIL in facilitating L2 learners' memory retention of subject matter. The between-groups analysis demonstrates a sum of squares of 0.380, with 1 degree of freedom, resulting in a mean square value of 0.380. The F-value is 1.359, and the associated p-value is 0.247, indicating that there is no statistically significant difference between genders regarding the impact of CLIL on L2 learners' memory retention of subject matter.

The third row examines the promotion of L2 learners' engagement in class through CLIL programs. The between-groups analysis reveals a sum of squares of 0.214, with 1 degree of freedom, resulting in a mean square value of 0.214. The F-value is 0.569, and the associated p-value is 0.452, indicating that there is no statistically significant difference between genders regarding the impact of CLIL on promoting L2 learners' engagement in class.

The fourth row investigates whether CLIL programs prepare L2 learners for academic success. The between-groups analysis demonstrates a sum of squares of 1.624, with 1 degree of freedom, resulting in a mean square value of 1.624. The F-value is 0.620, and the associated p-value is 0.433, suggesting that there is no statistically significant difference between genders regarding the preparation of L2 learners for academic success through CLIL programs.

The fifth row explores the enhancement of L2 learners' language proficiency through CLIL programs. The between-groups analysis reveals a sum of squares of 0.057, with 1 degree of freedom, resulting in a mean square value of 0.057. The F-value is 5.950, and the associated p-value is 0.017, indicating a statistically significant difference between genders. CLIL programs are perceived to enhance L2 learners' language proficiency.

Qualitative Analysis

Upon meticulous examination of the gathered data from the four interviewed participants, namely Teacher 1, Teacher 2, Teacher 3, and Teacher 4, a noticeable trend emerges. Each teacher's response to the interview questions reflects a shared belief centered on the fundamental importance of student learning and comprehension of

basic concepts. Different questions were asked from the teachers and their replies were then transcribed. The detail is given below:

The first question which was asked from the teachers was "*how long have you been teaching L2?*". The teachers' reply was different as: Teacher 1, with a decade of L2 teaching experience, emphasizes the continuous learning and improvement inherent in the role. Teacher 2, in the early stages of their teaching career, expresses enthusiasm for the transformative potential of language learning. Teacher 3, having transitioned to an educational leadership role, emphasizes the importance of curriculum design and cultural understanding. Teacher 4, as a language learner themselves, advocates for a supportive and growth-oriented classroom environment. Together, these diverse perspectives highlight the multifaceted nature of L2 teaching and the shared commitment to fostering effective language learning experiences.

The second question that was asked from the teachers was, "*have you ever taught CLIL programs? If so, how many CLIL courses have you taught?*". The teachers replied: teacher 1, with 5 years of experience teaching CLIL programs, emphasizes the positive impact of integrating language learning with subject matter expertise across various disciplines. Teacher 2 incorporates language learning activities within their English literature classes to enhance students' language acquisition and deepen their comprehension of the literature. Teacher 3 highlights the rewarding experience of teaching a CLIL math course to international students, witnessing their accelerated language development alongside advanced math learning. Teacher 4, as a language program coordinator, acknowledges the effectiveness of CLIL in supporting language acquisition and subject area knowledge, but emphasizes the importance of careful planning and collaboration between language and subject area teachers for successful implementation. Together, these perspectives underscore the value of CLIL in promoting integrated language and content learning experiences.

In their responses to the question about the advantages of CLIL programs for L2 learners in terms of cognitive development "*In your experience, what are the advantages of CLIL programs for L2 learners in terms of cognitive development?*", the teachers provided insightful perspectives. Teacher 1 emphasized that CLIL programs foster cognitive flexibility, problem-solving skills, and critical thinking by immersing students in subject area content in a second language. They also highlighted how CLIL programs promote metacognitive awareness and strategic learning. Teacher 2 noted that CLIL programs address the challenges faced by L2 learners in traditional language classrooms by connecting language learning with meaningful content, leading to increased motivation, engagement, and improved cognitive development. Teacher 3 highlighted that CLIL programs deepen L2 learners' understanding of subject area content, as learning it in a second language promotes a more meaningful engagement and transfer of knowledge to new contexts. This, in turn, enhances cognitive development and understanding of both language and subject matter. Teacher 4 emphasized that CLIL programs are particularly advantageous for L2 learners aspiring to pursue higher education or careers in specific fields. Developing language proficiency in subject areas equips students for success in college or career training, contributing to overall cognitive development and future achievements. These responses collectively highlight the cognitive benefits of CLIL programs for L2 learners, including cognitive flexibility, problem-solving skills, deeper content understanding, metacognitive awareness, and enhanced preparation for higher education and careers.

When asked about their approach to incorporating content-based instruction and integrating language and content learning in L2 classes "*how do you incorporate*

content-based instruction in your L2 classes, and what strategies do you use to integrate language and content learning?", the teachers shared their strategies. Teacher 1 utilizes visual aids like graphic organizers, along with project-based learning and inquiry-based activities, to foster connections between language and subject matter. Teacher 2 finds real-world materials and authentic texts, such as news articles or podcasts, to be effective in promoting language learning and content knowledge development. Teacher 3 emphasizes scaffolding, breaking down complex concepts and integrating language learning into subject area classes, highlighting the interconnections. Teacher 4 advocates for technology, utilizing online simulations, virtual field trips, and digital tools for formative assessment to enhance students' exploration of subjects and track their progress in both language and content learning. These varied strategies demonstrate the teachers' commitment to engaging and effective content-based instruction that intertwines language and subject matter, catering to the needs and interests of L2 learners.

When asked about the challenges faced by L2 learners in CLIL programs and their approaches to addressing them "*in your opinion, what are the challenges that L2 learners face when participating in CLIL programs, and how do you address them in your teaching?*", the teachers provided the following insights: Teacher 1 identifies the cognitive demands of learning content in a second language as a significant challenge. They address this by incorporating strategies like scaffolding and graphic organizers to facilitate understanding and providing regular feedback and revision opportunities. Teacher 2 acknowledges the challenge of subject-specific vocabulary and addresses it through vocabulary-building activities and contextual practice. Teacher 3 highlights cultural differences as a potential obstacle and addresses this by incorporating culturally relevant materials, fostering cultural sharing, and being sensitive to students' backgrounds. Teacher 4 observes that L2 learners may struggle with language proficiency in certain subjects and addresses this by offering additional support, such as differentiated instruction or one-on-one tutoring, and ensuring that language demands are transparent and accessible to all students. These teachers' strategies aim to mitigate challenges and create an inclusive learning environment for L2 learners in CLIL programs.

The teachers were asked, "*how do you assess the development of L2 learners' cognitive skills in CLIL programs?*". They replied: Teacher 1 utilizes project-based assessments, presentations, and written assignments, providing frequent feedback to nurture critical thinking and problem-solving skills. Teacher 2 employs formative assessments like class discussions and exit tickets, complemented by summative assessments such as exams and essays. Teacher 3 uses headers designed for evaluating language and content development, incorporating self-assessment opportunities. Teacher 4 employs activities like debates, simulations, and problem-solving tasks to foster critical thinking and analytical skills, supplemented by peer evaluations and teacher feedback. Through these comprehensive assessment approaches, the teachers effectively gauge and support the cognitive growth of L2 learners in CLIL programs.

In response to the question about professional development opportunities for developing teaching skills in CLIL programs "*what type of professional development opportunities would be helpful for you in developing your teaching skills for CLIL programs?*", the teachers identified specific areas of focus. Teacher 1 highlighted the need for training in language acquisition, integrating language and content, and observing experienced CLIL teachers. Teacher 2 emphasized the importance of cultural competence and assessment design. Teacher 3 expressed a desire for practical strategies to manage mixed-ability classrooms, including differentiated instruction. Teacher 4 emphasized

the significance of enhancing digital skills for effective CLIL instruction. By addressing these areas through professional development, teachers can enhance their teaching skills and promote successful language and content learning in CLIL programs.

In the response of the question, "*what advice would you give to teachers who are new to teaching CLIL programs in terms of promoting the development of L2 learners' cognitive skills?*", the experienced CLIL teachers advise new teachers to promote the development of L2 learners' cognitive skills by incorporating inquiry-based learning strategies to foster critical thinking and problem-solving abilities. They also suggest focusing on metacognitive awareness to help students understand their learning process and become more effective learners. Additionally, project-based learning activities that encourage collaboration and real-world problem-solving are recommended, as they enhance critical thinking, creativity, and communication skills. Developing language proficiency through regular practice, contextual usage, and feedback is emphasized, along with the use of visual aids and sensory experiences to enhance cognitive development and language proficiency.

Findings

The comprehensive analysis of the data presented in Tables 1, 2, 3, and 4 reveals several key findings related to the relationship between gender and various aspects of CLIL programs. Overall, significant differences were observed between genders in language proficiency development, integration of content and language learning, improvement in critical thinking skills, and the broader implementation of CLIL programs in language education. However, no significant differences were found in problem-solving skills, creativity, comprehension of content-specific vocabulary, memory retention of subject matter, promotion of engagement in class, and preparation for academic success. These findings emphasize the importance of considering gender when designing and implementing CLIL programs, as it can have an impact on certain cognitive, cultural, content-related, and communication aspects. Educators and policymakers should take these findings into account to create inclusive and effective CLIL programs that cater to the diverse needs and preferences of both male and female learners.

The findings from the discussions on CLIL programs and the promotion of L2 learners' cognitive skills reveal valuable insights and recommendations for effective teaching practices. CLIL teachers emphasize the importance of integrating language and content knowledge, as well as employing inquiry-based learning strategies to foster critical thinking and problem-solving abilities. Metacognitive awareness and reflection are highlighted as key factors in helping students become more effective learners. Project-based learning activities are recognized as effective in developing critical thinking, creativity, and communication skills, while also providing opportunities for language application in real-world contexts. The development of language proficiency through regular practice, contextual usage, and feedback is identified as crucial for enhancing cognitive abilities. Visual aids, sensory experiences, and technology-based tools are recognized as valuable resources to support cognitive development and language proficiency. The findings collectively emphasize the dynamic nature of CLIL teaching, the dedication to enhancing students' language learning experiences, and the importance of integrating language and content knowledge to promote cognitive growth in L2 learners.

The presented data in Tables 1, 2, 3, and 4 offer valuable insights into the relationship between gender and various aspects of CLIL programs. Table 1 highlights

significant differences in language proficiency development, integration of content and language learning, and improvement in critical thinking skills, while no significant difference was found in problem-solving skills. Table 2 reveals differing perspectives between genders regarding the broader implementation of CLIL programs in language education. Table 3 indicates significant differences in the effectiveness of CLIL programs in developing cognitive skills but no difference in fostering creativity. Lastly, Table 4 shows a significant difference in enhancing language proficiency, while no significant differences were found in other communication aspects. These findings underscore the importance of considering gender in CLIL program implementation and provide valuable insights for educators and policymakers seeking to optimize CLIL program outcomes.

The advice provided by the experienced CLIL teachers offers valuable guidance for new teachers in promoting the development of L2 learners' cognitive skills in CLIL programs. Incorporating inquiry-based learning strategies, such as encouraging students to ask questions and explore topics independently, fosters critical thinking and problem-solving abilities. By focusing on metacognitive awareness, teachers can help students understand their learning process, reflect on their strengths and weaknesses, and set goals for improvement. Project-based learning activities provide opportunities for collaborative work and real-world problem-solving, enhancing critical thinking, creativity, and communication skills. Developing language proficiency through regular practice, contextual usage, and feedback is essential for cognitive development and language acquisition. Visual aids and sensory experiences further enhance students' cognitive skills and language proficiency. By implementing these strategies, teachers can create engaging and effective learning experiences for L2 learners in CLIL programs, facilitating their cognitive growth and overall language development.

Conclusion

In conclusion, the analysis of the data presented in Tables 1, 2, 3, and 4 provides valuable insights regarding the relationship between gender and various aspects of CLIL programs. The findings underscore the significance of gender in language proficiency development, integration of content and language learning, and improvement in critical thinking skills within CLIL programs. However, no significant differences were found in problem-solving skills, creativity, comprehension of content-specific vocabulary, memory retention of subject matter, promotion of engagement in class, and preparation for academic success. These findings highlight the importance of considering gender in the design and implementation of CLIL programs to ensure inclusivity and optimize outcomes. Additionally, the discussions on CLIL programs' impact on cognitive skills emphasize the need for integrating language and content knowledge, employing inquiry-based learning strategies, and providing opportunities for practical application of language in real-world contexts. The findings contribute to a better understanding of effective teaching practices in CLIL programs and emphasize the dynamic nature of CLIL teaching, focusing on enhancing language learning experiences and promoting cognitive growth in L2 learners.

Recommendations

Based on the findings of the study suggest several recommendations to enhance the effectiveness of CLIL programs. Firstly, educators and policymakers should consider the impact of gender on different aspects of CLIL programs, such as language proficiency development and integration of content and language learning. Tailoring CLIL approaches to address the specific needs and preferences of both male and female

learners can lead to improved outcomes. Additionally, integrating inquiry-based learning strategies and providing opportunities for practical application of language in real-world contexts can foster critical thinking skills and problem-solving abilities. Teachers should encourage metacognitive awareness and reflection among students to enhance their learning process. Moreover, the use of visual aids, sensory experiences, and technology-based tools can support cognitive development and language proficiency. Overall, the recommendations emphasize the importance of inclusive and student-centered approaches in CLIL programs to maximize the benefits for all learners.

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