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FORMATION OF COGNITIVE COMPETENCE IN FOREIGN LANGUAGE EDUCATION BASED ON CLIL

Abstract

This article looks at how undergraduate students develop cognitive competence when taught through Content and Language Integrated Learning (CLIL) in university-level foreign language programs. The focus is on first-year bachelor students majoring in Foreign Language Teacher Training, and it tracks how their intellectual engagement, analytical skills, and critical thinking grow. The study zooms in on the "Cognition" part of the 4C model (Content, Communication, Cognition, Culture) and examines how a dual-focused learning environment pushes students from Lower-Order Thinking Skills (LOTS) to Higher-Order Thinking Skills (HOTS) in line with Bloom's revised taxonomy. The experimental results and qualitative analysis show that combining subject content with foreign language learning clearly boosts conceptual processing, authentic language use, and metacognitive strategies in a university setting. The article also goes into the teaching side of things, using cognitive load theory and linguistic scaffolding to outline a model that universities can actually apply in professional training programs. Data was collected using qualitative methods, mainly student questionnaires given after several CLIL-based lessons.

Keywords: *CLIL methodology; foreign language education; undergraduate students; higher education; bachelor degree; cognitive competence; communicative proficiency; critical thinking; higher-order thinking skills.*

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ФОРМИРОВАНИЕ КОГНИТИВНОЙ КОМПЕТЕНЦИИ В ИНОЯЗЫЧНОМ ОБРАЗОВАНИИ НА ОСНОВЕ CLIL

Аннотация

В статье разбирается, как у бакалавров формируется когнитивная компетенция через методику CLIL (предметно-языковое интегрированное обучение) в вузе. Исследование посвящено тому, как со временем меняется познавательная активность и аналитические способности первокурсников, которые учатся на учителей иностранных языков. Отдельно выделен компонент "Cognition" (Когниция) в рамках концептуальной модели "4C" (Content, Communication, Cognition, Culture). Автор подробно описывает, как именно связываются предметные знания и языковые умения так, чтобы студенты переходили от простых мыслительных операций к более сложным когнитивным процессам по таксономии Блума. Результаты экспериментального обучения показывают: технология CLIL не только повышает мотивацию к изучению языка, но и формирует профессионально направленное критическое мышление у будущих специалистов в университетской среде. Для сбора данных использовались качественные методы, в частности анкетирование студентов.

Ключевые слова: методика CLIL; когнитивная компетенция; студенты бакалавриата; высшее образование; обучение иностранным языкам; коммуникативная компетенция; критическое мышление; навыки мышления высокого уровня.

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ШЕТТІЛДІК БІЛІМ БЕРУДЕГІ КОГНИТИВТІК ҚҰЗІРЕТТІ CLIL НЕГІЗІНДЕ ҚАЛЫПТАСТЫРУ

Аңдатпа

Мақалада шеттілдік білім беру жағдайында CLIL (пән мен тілді кіріктіріп оқыту) әдістемесі арқылы студенттердің когнитивтік құзіреттілігін қалыптастыру мәселелері кең талданады. Зерттеу нысаны ретінде жоғары оқу орнында шет тілі мұғалімдерін даярлау бағыты бойынша оқитын 1-курс бакалавриат студенттері алынған, олардың танымдық белсенділігі мен ақпаратты талдау қабілеттерінің даму динамикасы қарастырылған. Мақалада CLIL технологиясының "4C" моделіндегі (Content, Communication, Cognition, Culture) "Cognition" (Когниция) компонентінің теориялық және практикалық қырлары жеке ашылған. Эксперимент нәтижелері пәндік мазмұн мен шет тілін кіріктіріп оқыту бакалавриат студенттерінің сыни ойлауын дамытатынын және күрделі академиялық ақпаратты шет тілінде концептуалды деңгейде өңдеу дағдыларын қалыптастыратынын көрсетеді. Сонымен бірге, мақалада когнитивтік жүктемені реттеу және тілдік қолдау (scaffolding) құралдарын қолданудың әдістемелік ерекшеліктері сипатталады. Деректерді жинауда сапалық зерттеу әдістері қолданылған, студенттерге сауалнама жүргізілген.

Түйін сөздер: CLIL әдістемесі; когнитивтік құзіреттілік; шет тілін оқыту; бакалавриат студенттері; жоғары білім; коммуникативтік құзіреттілік; сыни ойлау; жоғары деңгейдегі ойлау дағдылары; Блум таксономиясы.

Introduction

English language teaching has changed a lot over the last few decades because of globalization, new technology, the widespread use of AI, and the growing pressure for people to reach a high level of communication skills. All of this keeps reinforcing English as the main global language and pushes teachers and institutions to bring in more effective teaching methods and new tools like AI to boost learning efficiency, learner independence, and teaching quality (Li, 2024; Ulfa, 2023). University classrooms now need interactive ways of teaching that go well beyond old-school grammar drills or one-way lectures. The focus has to be on meaningful, contextualized language use that matches the complexity of real communication outside the classroom. Because of this shift, teachers around the world are rethinking traditional, teacher-centered methods and moving toward student-centered approaches that highlight interaction, strong learner engagement, and tasks rooted in real contexts. When you zoom in on a specific teaching setting, a more focused research design makes it possible to really dig into what teachers do, how students behave, and what concrete learning results they get. Studies like this also show how teachers can use technology, online materials, and communicative tasks to cross geographical gaps and give students access to real, authentic language input (Eslit, 2023; Zulkarnain & Yunus, 2023). This study looks at the actual teaching strategies used in an English as a Foreign Language classroom and evaluates how they affect student participation and cognitive language development. It focuses in particular on how a systematic use of Content and Language Integrated Learning (CLIL) shapes first-year undergraduates' participation, communicative skills, and their qualitative views of the learning experience. By taking a close look at what happens in class and how learners experience

it, the study aims to offer concrete, practice-based insights into the value of CLIL in contemporary foreign language teacher education.

Methods

Content and Language Integrated Learning (CLIL) at university is built on the idea that people learn a language better when they're busy making sense of real academic content, not drilling separate grammar points. In higher education, especially in undergraduate teacher training, CLIL links subject knowledge with the kind of professional communication skills students actually need. Coyle, Hood, and Marsh (2010) argue that when content and language are taught together, the classroom becomes a richer space that mirrors real professional situations. In this setup, language isn't treated as something to dissect; it's the tool students use to build, question, and discuss academic reality.

With CLIL, classroom talk naturally pushes students into higher-order thinking: they look at how variables relate, explore alternative solutions, weigh different decisions, and think through the consequences of each option. Through this kind of analytical discussion, they build a solid understanding of the context and sharpen their professional problem-solving skills (Ellet, 2007).

Niyazova (2014) argues that for integrated teaching to really work, students need ongoing exposure to a wide range of practice-based problems. These problems have to be combined in a deliberate way so students get systematic training in solving them and gain a deeper, long-lasting grasp of the material. Teaching should also put undergraduates in situations where they handle practical tasks by directly using their previous professional experience, their existing knowledge, and their current skills. They're pushed to examine the conditions of a problem carefully, compare different possible solutions, weigh alternatives, and then choose the best course of action. On top of that, modern teaching should use visual aids, natural language processing tools, and machine learning systems to give real-time feedback and let students fine-tune their language skills on their own (Konyrova, 2024).

Even though there's a lot of research saying this integrated approach works very well, some studies point out serious downsides and practical limits. CLIL lessons demand a lot of prep from both teachers and students, and this heavy time and planning load can drag down overall classroom efficiency. Zafer Çakmak and İsmail Hakan Akgün (2018) point out that creating good content-based materials takes a lot of time and energy, and it becomes especially hard to run in big or overcrowded classes. Success depends strongly on how well teachers are prepared and how good they are at guiding discussions; if the teacher doesn't manage it well, discussions can become messy and hard to evaluate in any consistent way.

CLIL also doesn't work as well when students don't have enough background knowledge, vocabulary, or cognitive readiness for the topic. It's not easy to find or design materials that really fit both the course aims and the students' level of development. When this alignment is off, discussions lose depth, students' confidence drops, and it becomes harder for them to apply what they learned outside the classroom. Students with weaker language skills often struggle with preparation and with taking part in unscripted discussions, which lowers the effectiveness of the whole class (Zafer & Cakmak, 2018). Hidayati (2021) argues that content-integrated approaches work best in more complex teaching situations that involve decision-making and problem solving, and don't work as well when the goal is mainly to deliver straight factual information.

All of this lines up closely with the teaching and practical issues Mostert (2007) talks about.

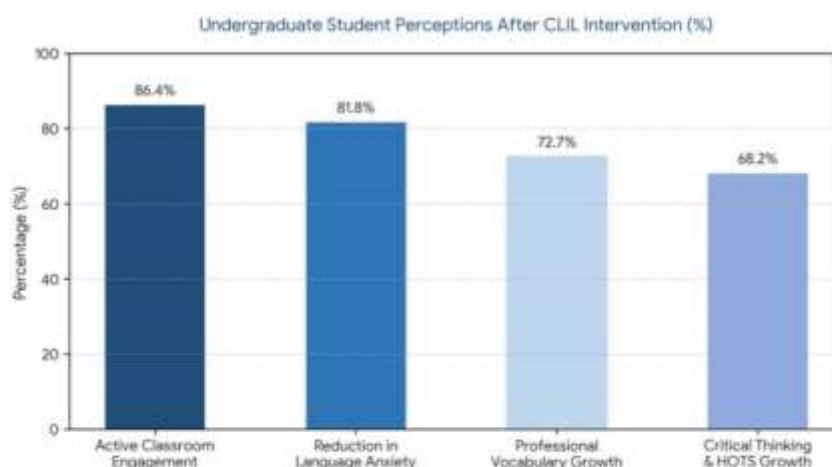
Research results

The data from the post-intervention tools shows clearly how Content and Language Integrated Learning (CLIL) affected the development of cognitive competence in first-year undergraduates. Before the CLIL course started, the initial observations and baseline surveys showed that most students had trouble with higher-order cognitive processing in a foreign language. 86.4% said their earlier English classes were mostly about mechanical grammar drills, rote memorization, and passive translation, so they were not ready for independent conceptual analysis. On top of that, 27.3% of them started out with low oral communicative confidence, strong

affective barriers, and visible anxiety when they had to take part in spontaneous academic discussion.

After content teaching and language teaching were fully integrated across the semester, the post-intervention questionnaire showed a major shift in both engagement and how students saw their own cognitive development. Looking at classroom interaction and teaching methods, 86.4% of the students agreed that the content-focused CLIL modules pushed them to take part much more actively in discussions and problem-solving tasks than in traditional, form-focused language seminars. The dual focus moved their attention away from abstract accuracy and toward meaningful situational analysis.

Figure 1. Undergraduate Student Perceptions After CLIL Intervention (%)



The quantitative and qualitative findings on self-efficacy and psychological barriers show a clear improvement in oral production. 81.8% of the students reported a strong drop in language anxiety and said they felt much more at ease speaking English when the main goal of the lesson was to break down an educational problem or analyze a pedagogical situation, instead of trying not to make grammar mistakes.

In terms of academic competence and cognitive development, focus group participants pointed to several connected areas of professional growth:

72.7% said that intensive work with disciplinary pedagogical content directly led to fast growth in their specialized vocabulary, academic collocations, and professional terminology in the target language.

68.2% showed and reported solid gains in critical thinking, analytical reasoning, and independent problem solving, and confirmed that the integrated tasks activated their higher-order thinking skills (HOTS).

Alongside these clear positive results, the data also shows ongoing structural issues and cognitive difficulties that need careful teaching responses. 63.6% of the students said they still had regular problems when they tried to put complex, abstract ideas into words or connect theoretical concepts during class presentations, mainly because of remaining lexical gaps and weaknesses in academic discourse.

Discussion

The results of this study give a clear picture of how effective Content and Language Integrated Learning (CLIL) is for building the cognitive competence of first-year university students. The main result is that 86.4% of participants showed a clear increase in active classroom engagement. That confirms that when language teaching is built around meaningful academic content, it sparks students' interest and motivation. In traditional foreign language classes, undergraduates are usually stuck in passive role-play and artificial communication tasks that don't match their actual cognitive level. When you bring in real disciplinary content through the target language, the

learning environment automatically demands more personal involvement and shifts students from passive listeners to active academic investigators.

There is also a clear link between integrating content and lowering psychological barriers: 81.8% of students reported a strong drop in speaking anxiety. This directly supports the classic affective filter hypothesis in second language acquisition. When university students concentrate on decoding complex subject matter, analyzing variables, and working through structural solutions instead of worrying about surface-level grammatical correctness, their internal anxiety about language use goes down. Language stops being an abstract academic hurdle and turns into a practical tool for communication. This matches the findings of Suleimenova (2013) and Zhetpisbayeva and Shelestova (2018), who show that interactive, problem-focused environments in Kazakhstani higher education lead to spontaneous language use and real communicative fluency.

Cognitive growth in the focus group is also clear from the 68.2% of respondents who noticed structural improvements in their critical thinking and Higher-Order Thinking Skills (HOTS). By deliberately building the upper levels of Bloom's Revised Taxonomy (analyzing, evaluating, creating) into the language syllabus, students were pushed beyond shallow understanding of meaning. The tasks pushed them to break down complex academic texts, evaluate pedagogical decisions, and pull together their own ideas into original educational designs. This intellectual pressure supports what Coyle, Hood, and Marsh (2010) argue: the Cognition dimension of CLIL drives university learners away from rote memorization and toward structured abstract thinking.

At the same time, the data point to an important teaching warning: 63.6% of students said they regularly struggled to express highly abstract concepts because of ongoing gaps in vocabulary. This shows that cognitive development does not happen in a language vacuum; demanding cognitive tasks must be matched with clear, explicit language support. If the language load is too heavy, the learner's working memory gets hit with extra cognitive overload, and both content understanding and language production can break down. This matches the instructional and practical difficulties described by Mostert (2007) and Zafer Çakmak and İsmail Hakan Akgün (2018), who stress that tough academic content has to be paired with equally strong scaffolding.

On top of that, the 31.8% of students who reported problems with group dynamics show that collaborative synthesis only really works when cooperative learning is tightly structured so that students can't just sit back and stay passive.

Conclusion

This empirical study looked at how well Content and Language Integrated Learning (CLIL) actually works for building cognitive competence in first-year undergrads in a foreign language teacher training program. The results show clearly: when language learning is tied to demanding academic and pedagogical content, students develop stronger analytical skills, sharper critical thinking, and more confidence in their own communication. Shifting the focus away from isolated grammar drills and toward meaningful situational analysis turns CLIL into a double-focus approach that moves students from passive memorization (LOTS) to active evaluation and conceptual synthesis (HOTS).

The numbers and qualitative data from the post-intervention tools show that combining content and language reduces foreign language anxiety by lowering the affective filter. When students use the target language as a real working tool to unpack real educational situations, they participate more in class and start speaking more freely. At the same time, the main structural problem that came up - the lexical difficulties reported by 63.6% of students during complex cognitive tasks - points to something essential: advanced cognitive work does not function well without ongoing, focused language scaffolding. Intellectual challenge always has to go hand in hand with clear vocabulary support and conceptual organizers, or students end up overloaded.

So, CLIL comes out of this as a powerful, expandable teaching model that reshapes traditional foreign language teaching at university level. For this approach to keep working long term in Kazakhstani higher education, universities need to build curricula around carefully scaffolded,

content-based materials and well-structured cooperative learning setups. In the end, developing cognitive competence through CLIL means future language teachers graduate not only with strong language skills, but with the high-level analytical and metacognitive flexibility they need to handle the modern global knowledge economy.

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