



HARMONISING DIALOGUE AND CLIL: AN APPLICATION IN THE GEOLOGY CLASSROOM

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Abstract

The paper discusses the importance of dialogue in foreign language learning based on current research studies at the tertiary level. For the purpose of better transparency, the paper is divided into four parts, each of which is equally important regardless of its sequence in the paper itself. The first part indicates the cognitive-emotional prerequisites that are necessary for successful learning not only of dialogue but also of everything that should have the quality of communication in its outcome. The second part deals with learning dialogue through the profession, that is, through an authentic language activity created according to the needs of geology students. The third part offers another language activity: a science comic, which, with the help of geoforensics, provides students with plenty of opportunities for a diverse dialogue in class. The fourth part deals with the "flipped classroom" as a model of proactive and creative learning through communication. Without pretensions to obtain all the results of such a triangulated approach in the first attempts of implementation, we tend to believe that subsequent practice with corrections and additions will give the full scope of the value of learning in the way offered. Equally, we hope that this paper will help to bridge the gap between academic content and language and truly offer the integration necessary for the coming multidisciplinary era.

Key words: *Dialogue, CLIL method, science comic, profession, flipped classroom.*

Introduction

Mastering dialogue or conversation is not only a skill but an art, especially when that dialogue is not in the mother tongue. Learning a second or foreign language is usually based on grammar, reading and comprehension. It is only later that the conversation begins to a very small extent and the storytelling to an even lesser extent. All this results in the fact that many speakers, who have previously prepared and successfully mastered a foreign language course in the classroom, have a problem following and communicating with foreign speakers in an extracurricular environment. In contrast, when acquiring a first language, we start immediately with speaking, before moving

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on to grammar and writing skills. If speaking is a basic language skill, and it is, then the question arises: how can we better integrate conversation or dialogue into language teaching?

Most of us think that learning begins in the cognitive centre of the brain. Therefore, it is not surprising that teachers complain that students are not motivated to learn. The research of Marzano and Kendall [1] reveals the following: the self-system or internal system is the one that decides whether a student will engage in learning or not. The self-system is the system of each individual that consists of interconnected attitudes, beliefs and emotions. The interaction of these attitudes determines the degree of our attention. Specifically, an individual's internal system determines not only whether an individual will engage or disengage, but also how much energy an individual will devote to learning or a given task [2].

In his book "How the Brain Learns", David Sousa talks about the importance of emotions to the brain [3]. Students who feel threatened in the classroom work in "survival" mode, and learning in that mode is very difficult, for example, a situation where a student feels that no matter how hard he/she tries, he/she will never be able to understand the subject or that he/she will never be able to reach its maximum potential. Therefore, if we cannot control our students' lives outside the classroom, and we cannot, then as teachers we can provide them with a quality environment in the classroom, in order to better prepare them for those conditions outside the classroom that are beyond our control. Factors of a rich and stimulating environment include the following: creating a sense of belonging, a high level of support, especially support for achievement, providing a sense of encouragement, and as many concrete speech activities as possible. Simply put: if we give students the tools they need to be successful, and then the opportunity to achieve that success, we'll have the definition of progress. When it comes to higher education, we all know very well that none of us have met a student who wants to fail an exam. In this sense, Hanson and Childs published the results of a survey given in Chicago, Houston and Norfolk with the question of what worries students the most [4]. The number one concern (51.77%) was failure, which unequivocally indicates that we as teachers have the power and ability to raise or completely eliminate that concern or fear of our students. The offered study aims to shed some light on the contemporary state-of-the-art trends of internationalisation and globalisation and their impact on teaching through English at higher education institutions.

Learning through the profession

It is believed that in traditional teaching language learners spend more time in comprehension tasks and exercises than in creating or freely producing language. However, modern memory research suggests that productive practice provides a much stronger learning experience than comprehension practice. The results of a study by Hopman and MacDonald from the University of Wisconsin-Madison [5] reveal that students who practice speaking outperform students who learn through comprehension exercises, because speaking simultaneously activates all language



elements of grammar and vocabulary. In other words, the study shows that speaking practice is a "link" that increases all contacts between linguistic elements as the speaker forms a sentence. Comprehension practice, on the other hand, does not integrate linguistic elements in the same way because learners are given ready-made language. Also, a good balance of listening and speaking is essential for effective language learning. It is equally important, and it should be constantly emphasized, that language teaching should be designed in such a way that the acquired skills and knowledge can be immediately applied in real life and profession, and not be a linguistic exercise of an educentric nature.

The practice of dialogue or conversation allows language learners to assimilate their acquired knowledge while integrating different cognitive skills to produce oral communication. Through activities such as discussions, debating and group projects, students are encouraged to communicate in a foreign language, express their ideas, offer arguments for their views and listen to others on the same tasks. This interaction contributes to the development of dialogic skills by enabling students to become active and confident participants in communication in a foreign language.

After acquiring sufficient knowledge to discuss a specific field (geotechnics, hydrogeology, mineral deposits, etc.), students are instructed to apply that knowledge through a discussion to the specific aspects of a certain profession. In the attached material, a language activity is offered with a simulated call for an internship/job where students should, in addition to the application, state reasons with full arguments whether the offered position is a suitable opportunity for them or not. In addition to extensive linguistic analysis, this activity encourages students to critically evaluate the requirements of the job and determine whether and to what extent they can meet the offered requirements. Regarding teaching, CLIL here provides a contextually rich integrative practice of language and content that encourages students to combine their knowledge and experiences on a deeper and more personal level. Through activities such as analysing different professions, students face real challenges that they will encounter later in their careers, which motivates them to develop not only language skills, but also the ability to successfully assess themselves in a concrete professional environment.

Table 1. Example of a CLIL document illustrating a detailed lesson preparation model

	A reading/speaking activity based on a specific topic: volcanologist
Thinking skills	Evaluating, reasoning, identifying, giving opinion
Language focus	Speaking about a specific topic, using CLIL and using specific language for being concrete and polite
Language skills	Reading, speaking
Time	10 – 20 minutes
Level	B2 or above



CONTENT	COGNITION	COMMUNICATION	CULTURE
- Highly specific CLIL activity - Creating a language database for critically assessing, determining, and discussing relevant terminological units and topics	- Verbal and visual interaction - Academic language - Practical application of the acquired vocabulary and CLIL units	- Precise and clear transmission of the desired message - Appropriate use of target - specific language	- Business culture - Since each profession is tied to a certain niche group, this exercise allows for the development of cultural adaptation and insights into various aspects of different careers

According to the CLIL method, a comprehensive didactic documentation is necessary in which the main guidelines for the implementation of every single activity are given. In the table below, there is a teaching document for the preparation of dialogic activity, which is based on the four pillars of the given method (content, cognition, communication and culture). It is important to emphasize that the implementation in the class, which will depend on the interest and participation of the students themselves, will affect the corrections of the didactic document so that the work plan and the implementation in the class are completely harmonized.

Therefore, instead of passively receiving information, the described CLIL activity encourages students to ask questions, evaluate, develop critical thinking and actively participate in discussions. Through the application of knowledge to real scenarios, such as the analysis of professional calls, students are motivated to articulate their views, evaluate situations and reasonably discuss their opinions or conclusions. This approach encourages not only language development, but also social skills, such as listening attentively, expressing opinions, connecting through the group, achieving a level of successful dialogue.

An example of CLIL activity related to the profession of volcanologist is shown in the Picture 1.

This activity shows that short-term language results in this case are related to long-term results, which cognitively facilitates students to recognize the challenges of knowledge in relation to the challenges of the profession. As Cummins warned, many language activities can inadvertently trap students in simplified and facilitated learning and tasks, where they will not be able to learn the language or content they need [6]).

It is important to emphasize the active application of concepts introduced in earlier activities, allowing students to explore more deeply the various aspects and possibilities within the profession. This includes assessing gender equality, working conditions, living standards and other relevant factors. Before or during this phase, students can conduct research on the cost of living in different locations and gather information relevant to their chosen profession. They can choose to work individually or in pairs.

Teachers are encouraged to be creative and independent in choosing exercises for their classrooms, thus encouraging their engagement with the subject. A typical ESP



teacher is a language teacher who does not take on the responsibility for teaching subject content as it is beyond their competence due to high cognitive demands in higher education. CLIL teacher, on the contrary provides ample opportunities to develop and integrate knowledge with language and develop learners' competences by means of active involvement and cooperation with subject specialists. Put differently, one of the ways of solving the "content" issue for the language specialists is to rely more on content specialists. Additionally, in CLIL it is not appropriate to repeat anything that students already know, apart from the obligatory reliance on prior knowledge, which is also not a key feature of ESP.

YOUNG VOLCANOLOGIST

Newspaper

Volcanologist (vulcanologist)

A geologist specialising in the study of volcanoes and eruptive systems. Typical activities include:

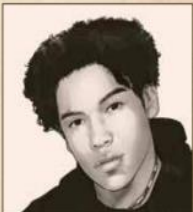
- researching various aspects of volcanism
- predicting possible eruptive events, especially with regard to habitations in volcanic hazard zones
- visiting both active and inactive volcanic sites to collect samples of past and present eruptive materials (tephra [ash, pumice], lava, etc)
- working in academic settings (universities

or museums) or monitoring stations

- compiling reports on ongoing volcanism

International Pacific Volcanological & Seismological Survey

The IPVSS team has been collecting data from the Pacific "Ring of Fire" region of intense volcanological and seismological activity. We are now looking to recruit a team of data analysts with some experience in the field of geology and / or geophysics to help process and classify the data prior to further research.



Students who have completed at least the first year of university geological study would be perfect applicants for this temporary (10 - 12 weeks) job, especially those who wish to specialise in the area of volcanology in the future.

(Volcanoes and volcanic eruptions are perhaps the most awe-inspiring of all geological features and events. Often depicted in movies as relatively short events, a volcanic eruption can spread over a considerable period of time - the eruption of Krakatoa (Letusan Krakatau) in 1883 was at its most violent and destructive on 27 August, but the event actually lasted from 20 May - 21 October (approximately), with related seismic events for another four months. The sound of the explosion was reported as being audible almost 5,000km away, and over 36,000 deaths have been attributed to the eruption and the tsunamis that it caused. The ash ejected into the atmosphere had severe effects on Earth's climate the following year.

More recently, the 2010 Eyjafjallajökull eruptions in Iceland, while relatively small, produced ash clouds which severely affected air traffic in northern and western Europe. Seismic and volcanic activity began on the Reykjanes Peninsula in the same country in February 2021, and were still ongoing in July of that year. The lava flow has become something of a tourist attraction.)

https://en.wikipedia.org/wiki/1883_eruption_of_Krakatoa
https://www.youtube.com/watch?v=OKJ_xRiidxU
<https://www.volcanodiscovery.com/reykjanes/crisis2021/current-activity.html>

Picture 1. Example of CLIL activity related to the profession of volcanologist



Learning through comics

Comics are often underestimated as an educational tool, although research shows that they have a significant impact on the development of communication skills and dialogue abilities among students at the university level [7]. These illustrated narratives offer a unique combination of visual and verbal components, the combination of which encourages numerous other skills such as critical thinking and analytical skills. One of the ways in which comics contribute to the development of communication skills is that they illustrate complex concepts and ideas with pictures in a clear and accessible way. Students often understand and remember information more easily when it is presented through visual elements, and comics provide just that combination of image and text. In addition, comics often require close reading which encourages analytical thinking and argumentative skills. Discussions about comic book content can also serve as an excellent platform for practicing debating skills as well as exchanging different perspectives and opinions among students.

It is important to point out that comics are also a rich source of cultural and social references that can help students understand the context and significance of certain topics. Through the study of comics, students can expand their knowledge of different cultures, historical periods, and social phenomena. In this sense, comics represent a valuable cultural tool through which bridges are developed between diverse disciplines that exist in isolation in science, while in real life they intersect in the most diverse and imaginative ways.

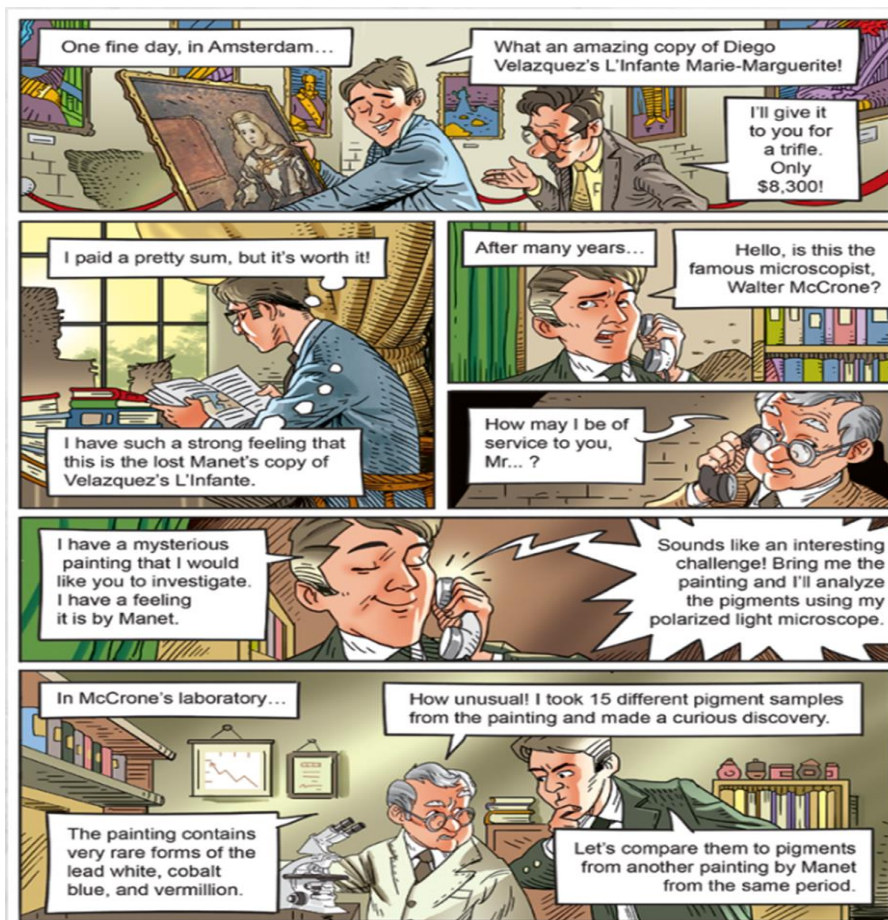
For better understanding, a short introduction is given for each comic, which we have listed: These real-life mysteries are examples of complex multi-disciplinary processes, involving geologists, the police/investigators, witnesses, the judiciary, and the media. Running through the textbook, they provide a basis on which students can build role plays to practise the communication of detached geological knowledge and facts to other disciplines. Teachers should feel free to improvise with the material to best meet the needs of their students.

The Case of a Mysterious Painting

Our story begins more than fifty years ago in Amsterdam. It was a lucky day for Andrew Brainerd, art collector who stumbled upon an interesting oil painting: A portrait of a young blond girl that curiously resembled Diego Velazquez's painting, L'Infante Marie-Marguerite. Brainerd didn't even blink when he paid \$8,300 for the painting, very excited about his new possession. And why was he so excited? As a knowledgeable art collector, he was aware of the existence of an elusive L'Infante copy made by another famous painter, Edouard Manet. And when he came upon this remarkable piece of art, he immediately started his investigation. Years passed without any meaningful discovery. Then Brainerd thought of contacting the famous microscopist, Walter McCrone. He asked McCrone to make an analysis of the painting, and the microscopist gladly accepted the challenge.



Here is what his investigation looked like: 1) First, he took pigment samples from 15 different locations on the painting and found three very unusual pigments: a rare lead white that had unique hexagonally shaped prisms, a cobalt blue with a strangely low refractive index, and a vermillion that was exceptionally pure. 2) Next, McCrone got a permission to take pigment samples from another Manet's painting from the same period, *Le ballet Espagnol*. He compared pigments from both paintings and confirmed that they contained all three unusual pigments. Moreover, he discovered that only these two paintings had that same lead white among 50 other paintings that used a lead white pigment. 3) Finally, the microscopist did a trace element analysis using an electron microprobe and isolated four lead white prisms from both paintings. A high level of agreement between the prisms suggests that all the lead white pigments possibly came from the same tube. McCrone's conclusion was that Brainerd's painting was most probably the "lost Manet". Though that is still not enough to officially claim the painting's true artist, this is the closest we'll ever get to prove a painting's authenticity using forensic geology.







The Flipped Classroom

Flipped or inverted classroom is learning that has not yet been clearly defined and adopted as an approach in higher education, although case studies, which are increasingly appearing, have documented measurable improvement and motivation of students and lecturers who use it [8]. In the 1990s, Harvard professor Eric Mazur developed a "peer tutoring" model in which he gave students material to think about and prepare before class, then used class time to encourage deeper cognitive thinking through peer interaction. Mazur called this type of learning "just in time learning" [9, 10].

A conference on university teaching and learning held on the theme "Flip the classroom: Using web course management tools to become a guide from the side" developed the concept of "flip" which promotes flipped teaching. According to this model, the material is delivered to the students before the class, while the role of the teacher is defined as that of a facilitator or "guide from the side" [11]. The name "flip" is presented as a model with four pillars of "turnover" in learning, that is, as an acronym where F represents a flexible learning environment (*eng.* flexible learning), L stands for a learning culture focused on encouraging deep learning (*eng.* learning culture centred to deep learning), I represents intentional content such as personalized, in order to initiate the maximum interest of each student (*eng.* intentional content) and P (*eng.* professional educator) represents a professional lecturer who leads learning by continuously improving practice.

It is important to note that flipped learning is complemented with information technology, which gives it another valuable addition to blended learning. The advantages of the flipped classroom for language learning include the following aspects:

- All the mentioned activities can be used before class, in the classroom, but also independently after class.
- All activities students can do independently, according to their own goals, needs and interests.
- All tasks can be modified by extending and creating reverse content through pre-existing media available for use.
- Media provide an additional opportunity to expand knowledge and interests that go beyond the classroom.
- Delivery of additional materials is left to the lecturer according to the interests of the students and thus personalized coaching becomes the norm of education.
- Interaction with colleagues or peers gives each student the opportunity to check their knowledge and receive feedback suitable for further learning, opening up the opportunity to incorporate other people's experiences.

Students who expect a conventional way of teaching based on monologue lectures may find the application of the new model disorienting, especially if it is sudden and unprepared. This is because our students do not have the habit of active participation in class, but rather the role of passive recipients who receive templated ways of solving



language tasks, mostly based on repetitive exercises of memory and understanding. The importance of preparing students for active learning is of key importance in relation to the aforementioned elements of emotional and cognitive learning.

Conclusion

In today's age marked by rapid advances in science, the lack of communication skills, successful communication or quality dialogue among young academics can be attributed to the fact that the language taught in traditional classrooms often bears no resemblance to real-life communication. If dialogue teaching is predictable and patterned, and productive speaking skills are not spontaneous, we cannot expect our students to be successful communicators in real situations. The education of the 21st century ensures that scientific illiteracy and communicative incompetence become the enemies of the new age. First of all, what we believe is crucial for the success of scientific dialogue, and is at the foundation of the CLIL method, is that teaching rests on the activation of the language of the students, not the teacher. The ratio of time allocated to the teacher and the student is increased in favour of the student, and the ratio of language and domain material is divided 50:50. This automatically advocates that language learning is based on a constructive rather than a repetitive model. CLIL teachers are therefore called upon to design activities in which language is used in authentic and purposeful use, with the student researcher, motivated and mentally prepared, just as the neuroscience of learning advocates and recommends. This work, in the spirit of the aforementioned CLIL principles and neuroscientific principles, offers two activities from the field of comics and professions, which offer students the opportunity to practice dialogue in a way that it is fully applicable in the real world. Placing students in flipped classroom conditions provides them with the opportunity to work autonomously and individually in a way that fully requires them to take responsibility for their own (lack of) knowledge, especially considering that the teaching materials have been successfully redirected to a multimodal teaching approach meeting not only cognitive standards, but also aesthetic and artistic.

References:

- [1] Marzano, R.J., & Kendall, J.S., *Designing and assessing educational objectives: Applying the new taxonomy*. Thousand Oaks, CA: Corwin, 2008.
- [2] S Marzano, R.J., *Designing a new taxonomy of educational objectives*. Thousand Oaks, CA: Corwin, 2001.
- [3] Sousa, D., *How the brain learns*. Thousand Oaks, CA: Corwin, 2006.
- [4] Hanson, J.M., & Childs, J., Creating a school where people like to be. *Educational Leadership*, 50(1), pp. 14-16., 1998.
- [5] Hopman, E.W.M., & MacDonald, M.C. (2018). Production practice during language learning improves comprehension, *Psychological science*, Sage, Vol. 29(6), pp. 961-971, 2018.



- [6] Cummins, J., Language, Power, and Pedagogy. Bilingual Children in the Crossfire. Clevedon: Multilingual Matters, 2000.
- [7] Beko, L., Mićović, D. (2023). Tailor-made comics on geoforensics in language teaching: interfaculty cooperation and application. *Teme: Časopis za društvene nauke*, pp. 405-422., 2023.
- [8] Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M., A Review of Flipped Learning. <http://www.flippedlearning.org/review>, 2023.
- [9] Mazur, E., Peer instruction: a user's manual. Upper Saddle River: Prentice Hall, 1997.
- [10] Crouch, C. H., & Mazur, E., Peer instruction: Ten years of experience and results. *American Journal of Physics*, 69(9), 970–977, 2001.
- [11] Baker, C. (2012). Flipped Classrooms: Turning Learning Upside Down: Trend of "Flipping Classrooms" Helps Teachers to Personalize Education. *Deseret News*. <http://www.deseretnews.com/article/765616415/Flipped-classrooms-Turning-learning-upside-down.html?pg=all>