



"Measuring the COVID Experience: Metric vs Imperial", or Using an Action Research Model and CLIL Task-Based-Projects to Bring about Content and Language Improvements during the Lockdown. A Case Study

Francesca Ripamonti¹

University of Milan, Italy - Liceo scientifico Statale "Gandini", Lodi, Italy¹

Abstract

This study describes an innovative CLIL action-research model which has been set up during the COVID-19 lockdown with a group of 9th-grade students of a scientific high school in Lodi (city notoriously famous for being one of the first COVID-19 epicenters in Italy). Its aim is to pedagogically improve the quality of distance education and to bring about learning improvements in both Math contents and the English language by exploiting the metric-imperial system conversions and using them to "measure the COVID experience". Outcomes also include significant advancements in the students' digital competence, new attitudes to scientific learning, cultural awareness, and critical thinking skills. To achieve these results, an action research approach has been followed. This has included an initial reflection on the remote teaching problem, setting research questions and objectives, planning, and selecting appropriate strategies for improvement, identifying signs of success, and monitoring progress. This study examines how the union of an action-research model with two CLIL task-based projects (focused on metric-imperial unit-conversions of temperature, length, width, mass, volume, and weight) not only has resulted in noteworthy advancements in contents, cognition, and communication but has also had a beneficial impact on the remote teaching modality and its implementation as a pioneering and revolutionary approach during the lockdown. Additionally, quantitative analyses and questionnaires have also proved how this approach is a powerful way of promoting motivation and interaction even in an online learning setting.

Keywords: CLIL, Action-Research, Distance teaching, Task-based learning, Key-Competences.

Background to the study

This study describes an innovative CLIL action research model which has been set up during the COVID-19 lockdown with a group of 9th-grade students of a scientific high school in Lodi aiming to pedagogically improve the quality of remote teaching and use it strategically to bring about learning improvements in both math contents and language. To achieve these preliminary results, an action research approach has been followed. This has included an initial reflection on a problem, setting research questions and objectives, planning and selecting appropriate strategies for improvement, identifying signs of success and monitoring progress.

Phase 1: planning

1.1. Identifying the problem: how to engage students in pedagogically effective activities during the COVID-19 remote teaching

Since the COVID-19 lockdown, the priority of all schools and teachers has been to equip themselves with the most innovative technology, the latest digital tools and applications. Webinars, online courses, free access to digital platforms have filled the educators' monitors as well as days with the precise purpose of improving the virtual connection with their students. A great amount of new digital activities and exercises have been generously delivered, disregarding the learning progression, macro and micro planning and, input-output scaffolding. In other words: losing sight of pedagogy.

As a result, students have frequently found themselves overwhelmed by ineffective assignments and impersonal resources with unproductive consequences on their involvement and learning. Especially first-year students who, with the COVID-19 outbreak had not accustomed yet to the High School didactic system and educational strategies.



1.2. Participants and actors

First-year students of a Secondary School (9th grade) Lyceum, specializing in Scientific studies, together with English teacher (Language teacher); Math teacher (Content teacher)

1.3. Brainstorming

Being located in Lodi, the notorious COVID-19 "Red Zone" epicenter, our school activated the Ministerial distance teaching modality on the first day of the quarantine: February 21st. Students and educators found themselves dealing with new online practices whose pace was faster than expected and sustained. Paradoxically, in the quarantine alone, teachers generated more digital contents and data than ever before, doubling the volume of information that would be offered in the pre-COVID traditional settings. Tasks kept multiplying and proliferating, leaving students adrift and directionless, totally lost among hundreds of activities frequently scheduled with hectic deadlines.

As a result, a group of 9th-grade students asked to have an online meeting determined to present their confused and bewildering situation. They complained about the persistent -sometimes aimless- digital burden they were being assigned. They asked for a solution. Consequently, a "*Remote teaching and learning survey in COVID-19 crisis*" was anonymously delivered whose results confirmed their general dissatisfaction.

1.4. CLIL as the focus of our action-research model and objectives

It was therefore decided to set up the CLIL methodology as the perfect way to meet the students' needs and to restore classroom balance. Pedagogy is central to CLIL thanks to its perfect correspondence between the "4C's" (Content, Communication, Cognition, and Culture); content scaffolding (which helps LOTS & HOTS reasoning and levels of thinking); a student-centered approach; the dual focus on content and language and the promotion of cognitive and social skills and habits. Also, CLIL practice aims at involving students being active participants in developing their potential skills, acquiring knowledge applying resourceful means for problem-solving. Elements that make CLIL methodology indispensable for educational success, beneficial in a remote virtual environment, and perfectly matching our general and formative objectives, which were:

- to avoid cold and boring online lectures
- to foster quality remote teaching
- to trigger cognitive progression
- to engage students by means of purposeful task-based learning activities
- to promote cooperative learning
- to get students to play an active role in their learning, despite the remote context
- to promote cooperation with their peers, instructors, parents
- to create a productive and safe online environment where the XXI century "knowledge triangle" (Coyle, Hood, Marsh, 2000, p. 5) was boosted with education, research and innovation as its key components
- to develop mathematical, digital, personal, social, citizenship and language key competencies and cultural awareness

1.5. Research Questions

1-Will students find it easier to follow the remote teaching if they take an active part in their learning process?

2-Will the virtual learning process (content+language) benefit if students are directly engaged in task-based activities, individually or collectively?

3-Will the COVID-19 nightmarish experience be mitigated and relieved if faced from a CLIL perspective?

Phase 2: Planning

2.1. Case Study

In order to lessen the digital burden the students had been forced to during the lockdown and, to reduce the alarming distress that the COVID-19 virus was exerting, it was decided to carry out a CLIL task-based project focused on the infection itself. Overwhelmed by COVID-19 figures, data and measurements, the chosen title of the CLIL project was "Measuring the Covid experience: Metric vs Imperial units" and it aimed at integrating Mathematics (DNL) and English (L2) with the specific



objectives of getting the students: to recognize number-types and quantities; to differentiate between metric and imperial units of measurement; to estimate the length, distance, capacity, weight and temperature of different bodies; to apply conversion to everyday objects and to calculate funny, real-life COVID related measurements.

2.2. Action plan: general "4C's" planning with Maths (DNL) and English (L2)

Content: "the COVID emergency". Students were invited to read and listen to information; to exchange their fears and worries; and provide explanations to the infection referring to the documents they had heard and read. Activation of prior knowledge (using L1, if necessary) and progression were granted. Input was given by means of online maps, charts, documents and practical demos. The final expected outputs were two task-based activities (performed both in pairs or in groups).

Communication: Students were given pandemic subject-specific information (L2); they were presented with data, numbers, measurements, units, metric and imperial conversions (DNL). Students were invited to look for information on metric and imperial conversions.

Cognitive challenge: Contents were scaffolded to support gradual (LOTS & HOTS) reasoning (Cinganotto, Cucurullo, 2019)

Culture & citizenship: activities were designed to ignite others' awareness

2.3. Student-centered activities

Step 1- Analysis of the COVID-19 spreading: facts and numbers (worksheets). The focus was on different number-types and units (authentic videos from *W.H.O*, e.g. "Tracking the COVID pandemic". Students in groups explained figures helped by frames of vocabulary and worksheets with technical-language content and content-compatible language.

Step 2- Investigation on Metric and Imperial units: their history, development, measurements and conversions were explained. TES and Khan videos and worksheets were assigned. Online peer work (*Google Meet/ Whatsapp*) was performed.

Step 3- Guided Task: groups looked for extra information on the origins of measurements and units. Frames on how to organize and classify large amount of facts were provided (to help with the Internet search)

Step 4: Students presented online their findings trying to apply functions, vocabulary and structures related to measurements and conversions. Immediate feedback was given.

Phase 3: observing and monitoring

During this phase, the following CLIL strategies were used to implement contents and reinforce vocabulary: presentation of new information; use of repetitions; demonstrations and rephrasing; visuals; scaffolding and linking new information to previous knowledge; analogies and exemplifications (carried out with the use of visual and multimedia aids); simple game-like activities suited for the class (adapted for weaker or special needs students). The general purpose was to make inputs comprehensible and context-embedded. Also digital resources were adopted: *puzzle-maker; kahoot; quizlet, padlet*.

3.1 Remote teaching strategies

In order to avoid cold and impersonal video lessons, remote teaching strategies were also taken into account, consisting in: group work; content variety; lectures avoidance; multiple resources; online discussions; tech tools and ongoing feedback.

3.2 Two task-based-projects

Finally students were asked to put their findings and ideas into practice. Precisely they were required to design two task-based-action-projects using the topics they had studied and analyzed. The driven objective was to let them explore real situations to make sense to the whole CLIL framework. These tasks were to be performed using the following web tools : *Canva* and *Adobe-Spark* and later pasted on Padlet.

3.4. Task-based n.1: Making scones

With the parents' involvement and supervision (family groups were all forced at home due to the lockdown), students were first invited to search for a traditional "Scone" recipe; then to convert the ingredients from imperial to metric units, oven temperatures, included. After that, quantity



approximations were required before setting off with the baking operation. Free choice and creativity were given to allow the novice bakers to build their own scones with a variety of add-ins like chocolate chips, berries, or nuts and spices. Finally, step-by-step photos and videos were to be posted in the class Padlet, with details explaining how the whole process (from the conversion to the baking of these flaky, flavorful, or crispy treats had taken place.

3.5. Task-based n.2:

In the attempt of minimizing the COVID-19 impact, students were also required to "measure" real objects virus related and frequently mentioned during the lockdown. Either in groups or individually they were encouraged to create a presentation of their choice (a poster, a leaflet, an infograph, a table or a video..) showing both the metric and imperial measurements they had crafted by means of these web tools: *Canva* or *Adobe-Spark*, *Padlet*.

Creativity has proved to be crucial to this project, as shown by the students' generous originality and inventiveness which has resulted in the following products: the size of their protective masks; the presumed size of the virus itself; the safe distance to be kept to avoid the Virus droplets; the safe body temperature; the amount of sanitizer needed to hygienically clean hands; the amount of weight students had put on since the lockdown or the length of their hair since they last went to the hairdresser'.

Phase 4: Final reflections and conclusions

Formative and self-assessment together with personalized feedback were constantly given. Rubrics with specific grading criteria were created and meant to assess content, language and presentation skills. The transparency and objectivity of the descriptors together with the immediacy and the ongoing feedback, made available and visible to all students from the onset of the two task-based projects, allowed the students to make the correct adjustments, where necessary.

4.1 Teachers' observation

The preliminary results all pointed to the benefits brought about by the CLIL methodology which, by creating a perfect balance between teaching, technology and pedagogy, has proved an effective strategy, even in a remote learning environment. From the teachers' perspectives, much has been achieved in terms of meta-cognition: CLIL has helped students to become aware of their own and other students' learning processes which accounts for their confidence in applying these transferable learning strategies to their work in other subjects.

4.2 Students' observations

From the online debates and written questionnaires conducted with students, positive feedback have been noticed on content, as CLIL promotes a broader range of teaching and learning strategies; introduces new ideas and concepts in the curriculum subjects and CLIL promotes progression and expansion in contents and technical vocabulary, as well. In terms of language acquisitions, CLIL opens doors on languages, provides exposure to the language without additional time in the curriculum while favouring unconscious mastery of grammar structures and technical language improvements (e.g. to estimate, to count, to multiply). Digital competency alike has been perfected and mastered with the promotion of new apps and web tools, and advancement in online interaction. Last but not least, CLIL nurtures self-confidence in learners and encourages stronger links with the real world.

References

- [1] Calhoun, E. F. (2002). Action research for school improvement. *Educational leadership*, 59(6), 18-24.
- [2] Cinganotto L., Cuccurullo D., "CLIL and CALL for a teacher's expertise: an international training experience." *Form@re-Open Journal per la formazione in rete*, 16.2 (2016): 319-336.
- [3] Cinganotto L., Cuccurullo D., (2019) *Techno CLIL: fare CLIL in digitale*. Loescher.
- [4] Coyle D., Hood P., Marsh D. (2010), *CLIL: Content and Language Integrated Learning*, Cambridge University Press, Cambridge
- [5] Mehisto P., Marsh D., Frigols M. J. (2008), *Uncovering CLIL*, Macmillan, Oxford.
- [6] Sagor, R. (2000). *Guiding school improvement with action research*. Ascd.



- [7] Simonson, M., Zvacek, S. M., & Smaldino, S. (2019). *Teaching and Learning at a Distance: Foundations of Distance Education* 7th Edition.