13 Technology-enhanced CLIL classrooms

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Objectives
Digital competence, as one of the European key competences for lifelong learning (European Parliament and the Council, 2006) has long been on the agenda of educational policy makers. ICT integration to foreign language teaching methodologies is practiced at all levels and for all language skills. CLIL, precisely, stands as a successful form of subject oriented language practice and helps develop multilingual societies. This chapter aims to outline the research and practices where CLIL meets technology providing examples and working links to resources.

Terminology and literature review
To briefly recap, Nikula (2015, p. 11-12) highlighted that the content orients CLIL classroom rather than language and tasks are mainly subject-specific. CLIL teachers approach language implicitly; hence, it remains as a means to interact between the teacher and students. At one end of this practice, scaffolding plays a vital role; the scaffolding strategies teachers administer include establishing and achieving learning goals, considering student needs, eliciting answers through supporting questions, motivating and praising students. At the other end, task and project based learning forms the basis for face to face, online and blended models. The close relationship between CLIL form and task-based learning eases the integration of tasks and hands-on activities as defined by Ellis (2013, p. 9-10), tasks require detailed planning, use of authentic language for communicative purposes and practicing of language and cognitive skills. Task-based language learning and teaching with technology have been considered complementary and approached from theoretical and practical aspects (Thomas & Reinders, 2010). Technology integrated tasks with clear guidelines which students can perform ubiquitously attract students attention and enhance their motivation. The end products published and peer reviewed online contribute to autonomous learning and hence improve their self-confidence.

As of note to the terminology, a comprehensive CLIL glossary can be found on the website of Cambridge English compiled based on the Teaching Knowledge Test (TKT) contents and British Council that emerged from the CLIL Essentials course.

CLIL in Turkey
Research on CLIL in Turkey is quite limited. Teaching a foreign language and learning content through an additional language have long been discussed within the framework of national educational policies. The relevant research in Turkey focuses more on Content-based instruction (CBI) (Arslan & Saka, 2010; Kızıltan & Ersanlı, 2007) than CLIL (Bozdoğan & Karlıdağ, 2013) concentrating on the theme-based model and its implementation. CLIL is by far practiced through participation in the international projects (eclilt.net, aeclil.eu and projectclil.tr.gg). Both CBI and CLIL studies mostly took place at the higher education institutions and reported positive perceptions of students and teachers with increased motivation.

Very recently, Language in Focus - LIF2015 conference hosted a CLIL Symposium to discuss the recent practices and the study as a project report by Yılmaz and Şeker (2013) included CLIL and ICT integration and the positive perceptions of young learners.

Technologies in CLIL
Technological advances and innovations are now indispensable part of educational policies all around the world. In language education, specifically CALL (Computer-assisted Language Learning) emerged to meet the needs of learners. Though it initially faced some resistance from teachers, teacher trainings helped them gain the awareness, confidence and necessary
competences. Twenty-first century learners are not only exposed to computers as tools of technology, tablet PCs and mobile phones are now more than just communication tools. Mobile learning (m-learning) is a recent area of investigation for researchers to see how mobile phones can be used for educational purposes. While, mobile-assisted language learning (MALL) refers to mobile phone use in practicing a foreign/second language. The literature of MALL displays a tendency to work on vocabulary practicing either through SMS or mobile apps (Duman, Orhon & Gedik, 2015). Regardless of the technological tool, successful implementations are directed to digitally competent teachers having enrolled in ICT teacher training courses and their preparedness to welcome such tools into their classes.

According to the European Commission’s report (2014, p. 27) on CLIL and CALL, they both bring positive impacts on language competences producing more successful outcomes from CLIL practices. CALL is observed to lessen learner anxiety, boost their motivation and provide a contextualized learning atmosphere harmonized to inter-cultural content. Research on CALL is far from announcing concrete language learning outcomes; some of the ways with specific contributions are chat (computer-mediated communication), online audio and visual multimedia resources, electronic dictionaries, computer-assisted pronunciation training (CAPT), intelligent tutor systems and game-based learning.

The EC report (ibid., p. 28) groups the criteria for successful implementation of CLIL and CALL as: teacher training with proper pedagogical design, effective adoption and integration; teaching approaches including selection of online materials, adoption of student-centred learning; and learning processes with references to constructivist tools and games-based tools.

Nevertheless, there still remains evidence based studies on CLIL and ICT combination. A project report on ICT integration to CLIL classrooms (Wojtowicz, Stansfield, Connolly & Hainey, 2011) highlights the survey results collected from CLIL practitioners who perceived such an incorporation highly positive and list the lack of resources as the most difficult aspect. The CLIL practitioners put more emphasis on the language competencies of students rather than their ICT skills (p. 6). Hence, there is a call for further studies providing clear guidelines and web-based materials with language practice and support.

Technology integration to CLIL classes can be simply observed as using PowerPoint presentations (Tragant, Marsol, Serrano & Llanes, 2015) and viewing YouTube videos. However, the technology changed the roles, a shift was for instance seen in preparing PowerPoint to practice vocabulary from the teacher to the students every week in a computer lab session (ibid., p. 5).

As an example of subject specific implementation, Binterová and Komínková (2013, p. 95) used interactive whiteboard elements and mathematical programs, i.e. GeoGebra to deliver Mathematics courses in English at the elementary school level and reached positive outcomes in terms of student and teacher motivation and willingness.

Another example of CLIL blended course environment through Moodle included eXeLearning, HotPotatoes, Skype and Survey Monkey (Pellegrino, De Santo & Vitale, 2013). Durán and Cruz (2013) integrated JClic and Atenex to content-based units with stories using these ICT for activities like crosswords, matching, identification of things, and words in context. InGenio authoring tool and content manager used by Gimeno, Seiz, de Siqueria and Martínez (2010, p. 3173) provides templates to create resources and learning activities in line with task-based learning. Ángel (2015, p. 3) conducted CLIL virtual laboratory sessions through WebQuests following the online routine of reading theory, watching an animation with subtitles, doing self-assessment and writing a laboratory report.

Examples of good practice and teaching tips for teachers

The topic CLIL and technology is widely found online with respects to providing a theoretical framework (e.g. online journals like ICRJ and LACLIL), presenting projects and their outcomes including resources (e.g. ICT-improving CLIL through technology and ECLIL European project building CLIL resources for language learning), using Web 2.0 tools like wikis (e.g. here) and blogs (e.g. here and here).
Additionally, the social bookmarking site Scoop.it includes numerous content on CLIL some concentrating on the ICT aspect such here and here.

For those interested in mobile learning, the Pinterest selection on apps and tablets for CLIL as a product of a EU project presents a compilation of necessary tools here.

The list of apps for Maths and Science (here) by the MOOC group of the Designing a New Learning Environment course can be listed as following:

**Maths apps:** Intro to Math, My 1st Tangrams HD, Numb, RedFish 4 kids, ArithmeTick, MathBoard, Ruler, Motion Math, Math Bingo, King of Math, Numerate: Count, Add and Subtract, Multi Measures HD, Fractals, Geometry Stash, Math Quizzer, iMathematics, Quick Graph, and Elevated Maths

**Science apps:** Molecules, Decibel 10, Wolfram Alpha, Scientific timer: Lab Timer, Science 360 from National Science foundation.

An interesting example of Music for CLIL used iWriteMusic app to compose and practice music can be found here.

Express Publishing developed Explore our World CLIL Readers app for levels 1-6 that includes a variety of subjects such as the Solar System and Baby Animals.

Below you can find authentic examples of CLIL activities that has fully integrated ICT:

- **Webquests**
  They are learner generated lesson formats including the parts of Task, Process, Resources, Evaluation and Conclusion.
  - example 1
  - example 2, e.g. here (in Spanish) (Ángel, 2015)
  - example 3

An example on CLIL is here:

![Content and Language Learning Integrated (CLIL)](questarden:147/46/6120829094536/index.htm)

- **Google for education**
  Google recommends the following tools to be used together to meet your educational purposes:
  - Google classroom productivity tools for classrooms
  - Gmail e-mail service provider
  - Google drive cloud storage to store and backup
  - Google vault with eDiscovery services of email and chat archiving, legal holds, drive file search, email and chat search, export and audit reports.
  - Google docs web-based documents that you can create, edit and share
  - Google sheets spreadsheets that you can edit and co-edit
  - Google sites here and here.

  Additionally, Google maps and Google Earth can be easily linked to subject classrooms.
- **Glogster**
  A multimedia interactive poster where you can tell stories, present projects and make notes.

A poster on CLIL:
Audacity
A voice recorder and audio editor. This software basically allows language learners to be exposed to a variety of audio resources and to practice pronunciation. Its use best fits to CLIL contexts as it facilitates task-based learning where students are given the chance to hands-on work to record, edit, convert and share the audio files.
An example of speaking practice using Audacity is here:

Screen capturing
- Screencast-o-matic
- Screencr
- Jing
With a screen capture software you can capture videos, animations and images to be shared on the web. For instance, a teacher can record the changes on a particular task and upload the video to have learners watch the video again at their convenience.

ExELearning
An authoring application to create and publish educational interactive web content.
Tag cloud generator
A word cloud generator that highlights the most frequently used word in a given text. It is generally used as a brainstorming and warm-up activity to help learners guess the topic.
- Wordle
An example on CLIL definition:
Mindmapping generator
A mind map is the visual representation of ideas and topics to structure, organize and analyze the content in the simplest terms. In language teaching, mind maps are used in the form of note taking, brainstorming and presentation activities.

- **Bubbl.us**
  An example on dog breeds:

- **Popplet**
  An example on Facts about Earth
Timeline generator
Timeline generators help organize the content by date and time. The digital version allows users to create, collaborate and share their timelines that include videos, images, text, links, location and timestamps.

- **Dipity**
  An example on the History of Technology

![History of Technology Timeline](image)

Voice-based e-learning tool

- **Voxopop**
The talkgroups help students interact while developing their speaking skills. An example talkgroup on digital storytelling in EFL classroom:

![Voxopop](image)

Book creator

- **Bookr** a tool to create online books using images from Flickr
- **Story Bird** a website to create online books using image gallery
An example story on Mathematics

- **Moviemaker**
- **Collaboration tool** whiteboard:
- **JClic**
  A set of computer applications that are used for carrying out different types of educational activities: puzzles, associations, text exercises, crosswords... (used by Durán & Cruz, 2013 to integrate the story “The three little pigs” and ICT in content based units)
  Making a puzzle

- **Atenex**
  (used by Durán & Cruz, 2013 to integrate the story “Charlotte's Web” and ICT in content-based units)
Quiz maker: Kahoot
A game-based platform where you can prepare quizzes, surveys or conduct discussions. Here is an example from an online CLIL training session.

Examples of recommended ready-made materials and sources
Among the pool of CLIL lesson plans, those with ICT practices are as following:
- Source bank 1
- Source bank 2
  Regional Geography - B1
- Geography
- History
- Science/Geography

Additional websites with resources:
- FACTWorld
  This forum supports teachers of CLIL in putting CLIL into practice through providing country reports, a journal (FACTWorld Journal), resources including links and articles.
- OnestopEnglish
  This site includes a section devoted to CLIL that covers What is CLIL? Secondary, Methodology, Image Gallery, Young Learners, Vocabulary, Animations and CLIL Teacher Magazine (Your CLIL).
- Clilstore
  An outcome of the European funded TOOLs project, Clilstore includes teaching units for CLIL based on the language learnt that are organized according to the language proficiency level. The texts are interlinked to the dictionary through Wordlink.
An example on living beings for English language learners at A2 level:

- **Bitesize** provides study guides for primary and secondary level students at many subjects. The resources are organized according to the British education system.

  Other related websites are BBC Science, BBC History, BBC Nature and BBC Religion and Ethics and BBC schools ([http://www.bbc.co.uk/schools/0/](http://www.bbc.co.uk/schools/0/))

- **Edheads** is a resource provider website with plenty of games & activities on science and math. An example activity on simple machines for 2-6 grade students

### Multimedia and CLIL

To best provide authentic materials including visuals like photos and videos, teachers can refer to the following sites:

- **YouTube channels**
  - Some selected YouTube channels that include videos on disciplinary areas, e.g. Physics Education, EngChannel, ScienceChannel, National Geographic.
  - **Documentary tube** allows viewers to watch full-length documentaries with categories such as history, art, health, economics, nature, sports, science and technology.
  - **Teachertube** not only offers videos and audio, it allows users to view, upload, share photos and docs, create groups and classrooms.
  - **Howstuffworks?** Includes videos, shows and quizzes on subjects like science, technology, health, and environment.
  - **TED Ed** video lessons target learners from elementary/primary level to college/university level in many subject areas, the website provides users to the chance to create their own lesson by selecting a video and customizing a lesson around it.
  - **Smithsonian Education** provides educational resources to educators, families and students. For educators, the lesson plans are available on art &design, science &technology, history &culture and language arts. The lesson plans integrate ICT use to a great extent. For instance, the lesson plan named *What's your problem? A Look at the Environment in Your Own Backyard* offers a downloadable lesson plan in the pdf format, a downloadable oral history interviewing guide and an online conference session recording available to view. Another lesson plan *Tale of a Whale and why it can be told* includes an online game.
  - **Khan Academy**, in addition to the free online courses, offers videos and interactive exercises. The virtual learning environment gives the learners the opportunity to experience distance learning about their selected courses and subject areas.
In conclusion, for the students of iGeneration some necessary pedagogical adjustments should cover the ICT use at all levels of education and as seen above numerous initiatives have already taken place. The resources have been transformed from coursebooks to online materials, websites, tools and apps. Many of the learning tools outlined above were referred in a trending list by Veselá (2012, pp.41-42) and the term CA-CLIL (Computer Assisted CLIL) was coined. Finally, the book by Dale and Tanner (2012) provides a comprehensive compilation of CLIL activities with a CD-ROM and makes plenty of references to technological tools. The abundance of literature on materials, teacher training and ICT tools simply present the recent trends in CLIL practices. All in all, regardless of the terms- e-CLIL or CA-CLIL, CLIL and technology combination seems to be a trending area of research and practice.

References
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