INTEGRATING MOBILE DEVICES INTO LANGUAGE LEARNING TO MEET THE 21ST CENTURY EDUCATIONAL CHALLENGES

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Abstract

This paper focuses on the value added by digital and mobile learning to the development of language competences and to the teaching/learning of subject content in a foreign language through CLIL methodology (Content and Language Integrated Learning).

The European Commission recommends CLIL as one of the most innovative strategies for the modernization of our education and training system. It has been successfully experimented in most European countries (Eurydice, 2012).

This paper makes reference to a report recently published by the European Commission (2014a), that focuses on the link between CLIL, CALL (Computer Assisted Language Learning) and MALL (Mobile Assisted Language Learning).

A brief literature review cites research in the field of digital and mobile learning and considers some different theoretical models and acronyms with the aim of outlining the potential of technologies in improving students' learning outcomes and the challenges that technologically-based teaching pose for teachers.

As an example of good practice, a European project called Creative Classroom Labs, on behalf of European Schoolnet (http://www.eun.org), is noted and described. The project, carried out in an Italian school, piloting the project, makes a significant contribution to the use of tablets in schools and discusses how tablets can support new learning approaches and scenarios, such as content creation, collaborative learning, personalized learning and flipped classrooms, integrating content, language, digital and socio-collaborative dimensions.

Keywords

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339

1. CLIL from CALL to MALL

CLIL (Content and Language Integrated Learning) is proposed by the European Commission as one of the most innovative strategies for the modernization of our education and training systems. According to the Communication from the European Commission *Rethinking Education* (European Commission, 2012), CLIL can be extremely useful for intensifying language exposure and improving motivation, linking language acquisition to themes that have a concrete relevance for the learners.

It is a dual focus approach aimed at delivering content in a foreign language, paying the same attention both to content and to language in all the steps of the learning path. The main idea is that you cannot acquire knowledge and content without access to the language through which they are delivered and, at the same time, it is not possible to develop language competences within contexts, which are deprived of any content (Crandall, 1994).

The acronym CLIL was created by David Marsh and Anne Maljers in 1994 (Marsh, 1994) to stress the integration of content and language in the learning process: while using a foreign language, you can learn content at the same time, improving the level of language competence and the motivation and interest in the subject.

From this idea it stems the '4 Cs' model proposed by Do Coyle and colleagues (Coyle et al., 2010): Content, Communication, Cognition and Culture/Citizenship. According to this model, the learning process results from the integration of these four dimensions adopting a holistic perspective, which includes linguistic, metalinguistic, cognitive and cultural aspects.

This approach is based on learner centricity, adopting active methodologies which can enable students to be the real protagonists of their learning pathways, co-constructing knowledge and developing competences with the help of their peers through collaborative activities and thanks to the scaffolding guide of the teacher. In fact, one of the most important and common strategies used during a CLIL lesson is the scaffolding process, which is the way teachers try to help students in the achievement of the objective of the lesson, guiding them towards progressive autonomy. Webquests, simulations, interactive activities are the key features of a CLIL lesson, in which the foreign language is used to carry out a precise and relevant task, according to the TBL (Task-Based Learning) (Skehan, 1998; Skehan and Foster, 2001).

CLIL activities in class can contribute to a more spontaneous and genuine use of the language in context. In fact, effective CLIL lessons take place in laboratories, in equipped rooms or even outdoors. This helps to improve the students' level of competence.

CLIL methodology has been successfully experimented in most European countries (Eurydice, 2012), and depending, on the national schools policy of each country, the intervention has adopted different organizational strategies and features. In addition, CLIL provision all over Europe is becoming more and more widespread.

In Italy it was introduced by a Reform Law in 2010 and it is offered in the last year of all upper secondary schools where subject content (humanistic subjects or STEM – Science, Technology, Engineering, Math) is delivered in a foreign language.

The European Commission recently published a report titled *Improving the effectiveness of language learning: CLIL and computer assisted language learning, European Commission* (European Commission, 2014b) which focuses on the link between CLIL and CALL, according to the following definitions:

> «[…] any process in which the learner uses a computer to improve foreign language competence. The technology includes not only computers but also smart phones, tablets, MP3 players, and consoles».

The following examples of CALL are mentioned in the Report, pointing out the added value they can give to a CLIL lesson:
- authentic foreign language material, such as video clips, flash-animations, web-quests, pod- casts;
- online environments, social media, or voice/video conferencing;
- language-learning tools (online apps or software);
- online proprietary virtual learning environments;
- game-based learning.

The term Computer Assisted Language Learning (CALL) was introduced in the 1980s (Chapelle, 2001).

Some other alternative acronyms to CALL were created after the impressive rise of the Internet: TELL (Technology Enhanced Language Learning) (Bush and Terry, 1997), focusing on the technology rather than on the computer itself; WELL (Web-enhanced Language Learning), referring to the Internet as a medium for instruction; NBLL (Network-based Language Learning), (Warschauer and Kern, 2000), highlighting the interconnectivity of computers in facilitating interpersonal digital communication. All these definitions are based on the notion of students working on a laptop computer, with the aim of learning a language.

The increasing availability of mobile devices has led to the acronym Mobile Assisted Language Learning (MALL), which «differs from CALL in

its use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access across different contexts of use» (Kukulska-Hulme and Shields, 2008, p. 250). Many studies have confirmed the added value of different mobile devices in learning foreign languages (mobile phones, tablets, MP3 players, Podcasting). The wide success of MALL allows us to cross the boundaries between formal and informal learning (Vavoula G., Pachler N. and Kukulska-Hulme A., 2009), focusing on the social dimension and on the 'assisted language learning' dimension.

2.   Case study

The case study which follows is mentioned as an example of a project aimed at integrating the use of tablets in the teaching/learning process involving the development of language and digital competences and the delivery of subject content to upper secondary school students.

Daniela Cuccurullo, the co-author of this paper was directly involved in its implementation.

In April 2013 European Schoolnet (EUN)[1] launched the Creative Classrooms Labs (CCL) project[2] to develop innovative teaching and learning scenarios involving the use of tablets in and out of school. The project aimed at bringing together teachers and policy-makers in eight countries to design, implement and evaluate 1:1 tablet scenarios in 45 schools.

The scenarios are visions for innovative teaching/learning approaches and for the future classroom. They address trends and challenges facing schools and are relatively abstract descriptions of a learning and teaching experience describing the interactions of the learners and teachers with each other, tools and resources, the learning context and environment etc. They give a general outline of the type of learning and teaching processes to be supported by the use of tablets during the policy experimentation. They serve as a reference framework for the learning stories/activities.

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[1] European Schoolnet is a network of 31 European Ministries of Education, based in Brussels. As a not-for-profit organisation, they aim to bring innovation in teaching and learning to key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. Since its founding in 1997, European Schoolnet has used its links with education ministries to help schools make effective use of educational technologies, equipping both teachers and pupils/students with the skills to achieve in the knowledge society. European Schoolnet provides both Ministries and schools with: information and services relating to the innovative use of educational technology; outreach campaigns on specific educational topics such as maths, science and technology; and research activities. INDIRE (Italian Institute for National Documentation, Innovation and Educational Research) represents the Italian Ministry of Education in EUN Consortium.

[2] http://www.scuola-digitale.it/classi-2-0/il-progetto/introduzione-2.

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342

Learning stories are example narratives that present how a collection of learning activities could be performed with students. Scenarios, learning stories/activities should include innovation in technology supported learning and teaching, in one form or other.

The different scenarios were developed using the Scenario Development Toolkit developed in the earlier iTEC project [3] the *Policy-Makers Scenarios and the Learning Stories* which included seven topics: Flipped Classroom, Collaboration, Personalization and Content Creation for the first cycle and Collaboration and Assessment, School to School Collaboration and Personalized Learning for the second one[4] (see Fig. 1).
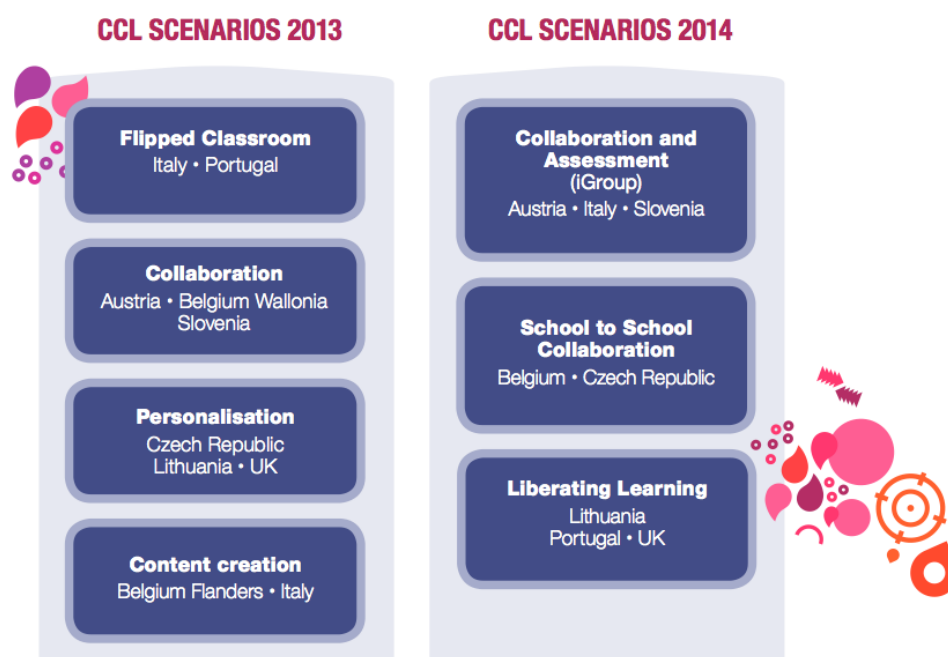

Fig. 1. Pedagogical scenarios/Learning activities from the iTEC project
[Source: Bannister, 2015a]

In the CCL, policy makers wanted to:
• support schools in achieving effective use of ICT in teaching and learning;
• improve and raise the quality of education in Europe;
• promote the European dimension in education.

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[3] See:
http://fcl.eun.org/documents/10180/275738/CCL_Scenarios_brochure_A4.indd_FINAl.pdf.
[4] See the scenario brochure of the four themes, providing information and practical tips on each:
http://fcl.eun.org/documents/10180/275738/CCL_Scenarios_brochure_A4.indd_FINAl.pdf.

The project took place in two phases, the first one from May 2013 to June 2014 and the second one from May 2014 to March 2015 and produced learning scenarios and activities, guidelines and recommendations on optimal strategies for implementing 1:1 initiatives in schools.

One of the participants was a lead teacher from Italy[5] who implemented the two year project in a 4th/5th class of a technical institute with four different branches of studies: ICT, Chemistry, Mechanics and Electronics. The students involved attended the Electronics branch and had advanced digital skills, having already been involved in a national project called Classroom 2.0.[6]

Background: process

Based on the iTEC methodology, the CCL project partners created the Policy Maker Scenarios during Mainstreaming workshops in May 2013/ May 2014. On the basis of the Policy Maker Scenarios, project partners and nine lead teachers (one from each country/region) developed Learning Stories together during Scenario Development Workshops in June 2013/June 2014.[7] Learning stories are groups of activities 'packaged together' to provide a holistic learning experience.

The aim of Learning Stories was to engage teachers, learners and stakeholders both inside and outside school. From the Learning Stories, teachers derived concrete lesson plans for their classes that incorporated the use of tablets. Some support documents guided and inspired the CCL teachers in the implementation of their own pilots.[8] Scenarios were used to present a vision of innovation in teaching and learning that would potentially challenge teachers to develop a wider set of competences, and provide opportunities for learners to acquire 21st century skills.

The case study: Scenarios

In the first cycle of the scenarios, the teacher adopted the Flipped Classroom approach[9] as a teaching/learning scenario to encourage students to undertake some learning at home prior to the lesson; the aim was to design activities that made the most of face-to-face time in classrooms for discussion and sharing and of students' access to online

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[5] Daniela Cuccurullo, co-author of this contribution.

[6] See: http://www.scuola-digitale.it/classi-2-0/il-progetto/introduzione-2.

[7] Further information about the scenario development process and the seven different scenarios created within the project is available on the project website: http://creative.eun.org.

[8] See: http://creative.eun.org/scenarios.

[9] For a detailed explanation of the Flipped Classroom scenario, see: Summary CCL Scenarios 1st cycle: http://creative.eun.org/c/document_library/get_file?uuid=de69cfbe-32c9-40ab-ba05-f6a4e92c3151&groupId=96459.

content and services outside the classroom and the school day.[10] The teacher was thus able to begin the lesson collating ideas in a collaborative digital space whilst the students contributed their ideas using tablets. This informed the next stage of the lesson where the students could collaborate to develop new resources, go into more detail and consolidate their learning (Bannister, 2015b).

For the second cycle, the teacher focused her attention on the Collaboration and Assessment scenario[11] to explore how to track the progress and assess the work of an individual student involved in collaborative learning, as well as to exploit the possibilities of the media option of a tablet. Furthermore, students could give their feedback and reflection of each student's work and develop personal competences and analytical/presentation/critical thinking/interactive skills.

Within this framework the teacher decided to adopt the CLIL (Content Language Integrated Learning) methodology; this meant that the English language teaching was integrated into the specialist subject. She had indeed been asked to develop her individual lesson plan on the basis of the scenario - learning/activities - learning stories pyramid and to give a more detailed description of the learning objectives, tools, resources and timeline in order to adapt the general topic to the specific context of her country/school/class.

A detailed description of the second cycle pilot is presented below.

The case study: From the scenario to the Learning stories and Learning activities

Learning Stories are sample narratives showing how a collection of Learning Activities would work when taken into the classroom.[12] Learning Activities in turn are descriptions of various activities that can be used in teaching and learning and describe, in more concrete terms, discrete sessions of learners/teacher interaction (Fig. 2). Both were developed using the *Scenario Development Toolkit* developed in the earlier iTEC project. They are:

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[10] See: Summary CCL Scenario Flipped Classroom:
http://creative.eun.org/c/document_library/get_file?uuid=49cfa249-1879-4373-b42c-d906dfdd9187&groupId=96459.

[11] For a detailed description of the *Collaboration & Assessment Scenario*, see: CCL Policy maker scenario: Collaboration & Assessment,
http://creative.eun.org/c/document_library/get_file?uuid=7b5992b7-ac4f-443b-89d7-6fa2f965f852&groupId=96459.

[12] The Collaboration & Assessment Learning Activities framework:
http://creative.eun.org/c/document_library/get_file?uuid=8d79aca2-3162-42dd-acf2-cd438b486963&groupId=96459

Fig. 2. An example of Learning Activities from CCL

Dream – in this phase teachers present a design brief to their class that ties in with the curriculum and the local community, but leaves room for interpretation. They inspire the students by providing them with the motivation for giving their best and by telling them about ownership and freedom over the task. They present the learning activities process and the schedule for the completion of the various tasks and negotiate the assessment criteria with the class. Students form teams, discuss, question and familiarize themselves with the design brief. The teams refine their design brief, particularly in relation to intended audiences, initial design challenges and possible design outcomes. Students record reflections and document their work online.

Explore – Student teams explore the context of their design either by observing relevant practices or environments using digital cameras, notebooks and microphones, or by researching existing works that relate to their design brief by collecting examples similar to those which they are intending to design. The object of observation depends on whom they are designing for, what they are designing and the initial challenges they want to address. They share their collected media files on their blogs and record a reflection. Teachers guide their research and support them in the qualification of their material.

Map – Teams analyze their findings using mind-mapping techniques. They identify relations, similarities and differences between the examples and/or media files they collected. Based on their collected information and analysis, the teams refine their design brief, especially the design challenges, design results and audience. Then the teams record a reflection. Open-ended questions can be challenging for students to answer initially. However, after crossing the initial threshold, students are likely to have inspiring ideas.

Reflect – Students and the teacher record, post and share audio-visual reflections and feedback on project progress, challenges and future steps. The students slowly build a shared collection of ways to tackle challenges, which can be used after the project has ended.

Make – Based on their refined design brief and design ideas, student teams start making. They create their first prototype, and discuss it

afterwards. The discussion especially relates to how well the design addresses the identified design challenges. They then record a reflection and document their activities. Careful guidance through the learning activities and the process of creation is indispensable for students to keep their minds on learning potential curricular requirements. Teachers highlight the reflection after this activity and ensure that everyone focuses on addressing the needs of an audience. To avoid free riders or unequal workload division, they carefully divide tasks and roles within teams.

Ask – Teams meet with 2-4 people, who could be future users of the prototypes, and communicate their prototypes and design ideas using prints, drawings or models. These participants are considered to have an expert understanding of the domain within which the student designs are framed. Expertise may be interpreted broadly, for example, a construction site worker can be considered to offer deep insight into the everyday practices of people on a building site. The expert participants are encouraged to use pens and post-it notes to modify and comment on the prototype. After the workshop the students analyze the comments and decide how to interpret them for their re-design. They then refine their design brief, especially in relation to the design challenges, context and added value of the result, record a reflection and update their documentation. This activity can happen more than once at various times during the design process. Students can collect feedback on their work by asking experts, potential future users as well as from other student teams and the teacher.

Show – Students create a video with English subtitles presenting their design results and process, as well as learning achievements and possible future steps. They share this documentation with other students, their parents and their target audience to transfer their learning, to communicate the background of their project, to let others know about the possibility to remix their work, and to receive feedback for improvement.

From the Learning activities teachers can derive concrete lesson plans for their classes that incorporate the use of tablets. Hence, the Policy Maker Scenario served as the basis for the Learning Stories and the Lesson Plans guiding the use of tablets on the topic Collaboration & Assessment (Fig. 3).
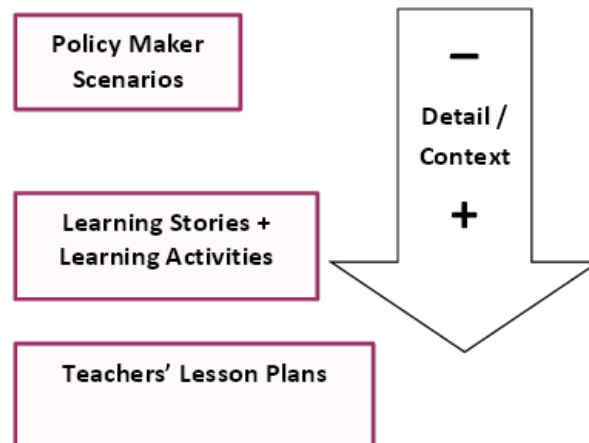
Fig. 3. Policy Maker Scenarios

The case study learning story

The narrative to accompany the scenario is as follows:

Antonio is given the task of coordinating a project within the curriculum context by his teacher. He and his classmates are attending the fifth year in a technical institute, where the learning of a subject through a foreign language is now an integrated part of the secondary school curriculum and of the final exam to get the diploma. His role within his group is to coordinate the production of an ESP multimedia e-booklet (The key aspects of Electronics) to present at the final exam. In the project he has to select the relevant topics and to control the quality and preciseness of its content; Manuel and Francesco are proofreaders, while Davide, Pasquale and Salvatore plan the storyboards. The other students contribute as surfers, video and picture makers, writers, editors. Vasyl is responsible for technological support and Dario for organizing the timetable and the required venue. Antonio has to reflect on the whole process and send an interim report to his teacher.

As well as monitoring the production of content and the development of personal competences and skills like analysis, presenting, critical thinking, social interaction, students have to make the most of the media options of a tablet; track individual contribution in collaboration activities and explore innovative forms of assessment. The first step, Dream, aims to set the scene for students, to create groups and allocate roles within them, to understand the design brief and formulate ideas for the product (the e-booklet) related to the essential topics of electronics to deal with in English, and to set group and personal learning objectives. The teacher helps to investigate innovative forms of assessment and implement them in the project. In the second phase, Explore, students, in groups in and outside school, investigate the topics and begin to assess and record the collective and individual learning and their contribution to it. Their discoveries are then shared and, in the Map phase, collated and stored digitally; they then

move on to plan in more detail the multimedia product to inform other people (the subject teachers) and demonstrate their understanding of the topic. The Make phase concerns creating a first version of the product, each student taking on particular tasks depending on their competences and interests. All the time each student's learning and contribution is being tracked. They then, in the Ask step, pause to review their progress and obtain feedback from the subject teachers on their product in its prototype form.

Using suggestions and criticism, the group defines what is needed to improve the product and in the Re-make stage, makes use of a range of tools to improve the production and make the most of their ESP e-booklet. Finally, in the Show session – the final exam - students present their production.

To implement the learning story, the teacher thus 'bent' the scenario onto a real teaching context, which resulted in a successful experience for developing students' language and content skills.

The main objective was to make the most of tablets and apps in order to change the traditional classroom into a digital hub and reach the further goal of teaching electronics and improving the language. At the same time, it was necessary to avoid the challenge of being inundated by an inappropriate use of apps or the use of apps for apps' sake. Both handheld devices and applications had to be handled through a careful and appropriate selection, according to the different thinking skills to be developed at each phase of the learning process and following Bloom's revised taxonomy (Fig. 4), that is also at the core of the CLIL methodology.

Fig. 4. Bloom's revised taxonomy[13]

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[13] See: https://allthingslearning.wordpress.com/2011/12/29/crafting-scenarios-for-21st-century-fluency-lessons.

The initial narrative of the scenario encouraged the teacher to give individual students roles within the tasks. The teacher had to encourage students to reflect on their learning and give final feedback discussing targets and competences of individual learners including their ability to interact with peers as well as to demonstrate critical thinking through analysis and presentation of new learning materials. She also wanted to enhance learners' autonomy and make students responsible for their active role in the project. Assessment and evaluation rubrics were created through Rubistar.

To integrate formal and informal learning, a virtual classroom was opened on Edmodo, where resources and ideas could be shared, as well as comment and discussion on different subject topics. In Edmodo the teacher uploaded some lessons in the screencast format or some links to a video online (Kahn Academy, Makezine or similar) in order to have students watch it following some problem-posing inputs; they had to solve the problems, helping each other and collaborating through the forum. The task for the lesson on the following day at school was to take notes (Evernote) to share with their schoolmates in an interactive way guided by the teacher. A digital board (Padlet) to post sticky notes was used and multimedia content was mind mapped through Popplet or assembled on Glogster, while a logical and chronological order was set through timelines on Dipity. Activities were implemented through the Learningapps website: all the digital content was then collected to create an ebook generated through Epub software.

The overall aims reached through the implementation of the scenario were:

- enhancing cooperation and collaboration among students
- researching and implementing innovative forms of assessment and evaluation
- sharing assessment criteria with students
- tracking the progress of individuals within a group and of peer/group-work
- promoting inclusion (students with disabilities and special needs and e-inclusion (students and families)
- enable students to be mobile and autonomous in their learning

in particular:
- building capacity through communication, collaboration, creation & critical thinking
- learning how to change a space into a place.

The shift from the term 'space' to the term 'place' can be better understood thanks to this quotation:

«Whereas space refers to the structural, geometrical qualities of a physical environment, place is the notion that includes the dimensions of lived experience, interaction and use of a space by its inhabitants» (Harrison and Dourish, 1996, quoted in Hornecker, 2005, p. 1).

In this place, the teacher developed innovative pedagogical scenarios based on CALL and MALL, focusing on how practice is changing as a result of tablets being used to collaborate, communicate, connect, think critically and create. In nutshell, scenarios were meant to enhance 21st century skills.

Furthermore, the teaching practices that technology enabled in a practical, friendly and easily approachable manner, enriched literacy learning: students were educated to apply the 21st literacies, that is:

- media literacy
- information literacy
- network literacy
- global literacy

and co-construct them through web 2.0 technology-infused instructional practices (Kajder, 2012). The biggest challenge, however, was to move further beyond the concepts of skills and literacies to cultivate the 21st century fluencies (Fig. 5):
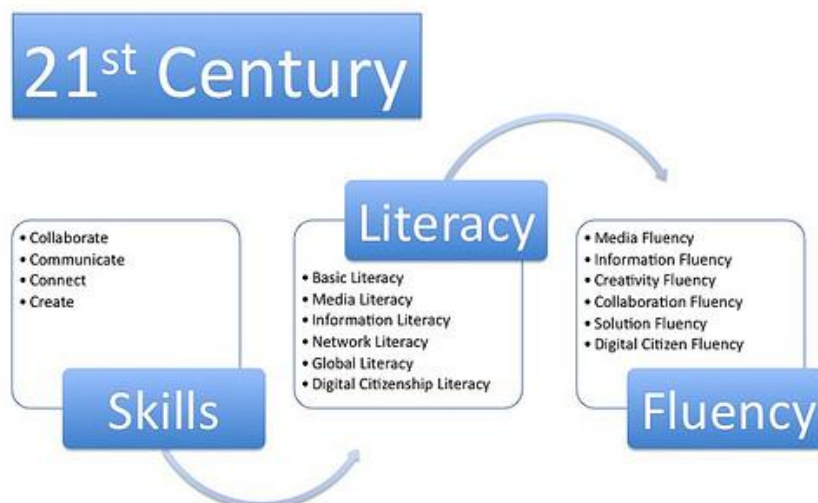

Fig. 5. Adapted from: Silvia Rosenthal Tolisano, 21st Century Skills-Literacies-Fluencies[14]

«The 21st Century Fluencies are not about technical prowess, they are critical thinking skills, and they are essential to living in this multimedia world. We call them fluencies for a reason. To be literate means to have knowledge or competence. To be fluent is

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[14] Read more at: http://langwitches.org/blog/2010/07/10/21st-century-skills-literacies-fluencies.

something a little more, it is to demonstrate mastery and to do so unconsciously and smoothly» (Crocket, Jukes and Churches, 2011).

The outcomes of this experimentation were recognized at international level by a European inspector in charge of an observation visit on behalf of European Schoolnet policy makers [15]. The results of the project demonstrated that both the use of handheld devices in digital learning and the adoption of CLIL methodology can have a huge impact on school curricula, with great advantages both for the foreign language and for the subject content delivered through that language. This initiative has turned out to be an example of good practice in the implementation of CLIL through CALL and MALL all over Italy, meeting both the latest national school policies and the recent Communications from the European Commission.

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[15] See *Case Studies* based on Observation visits,
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353