

Competences-Based Spaced Learning

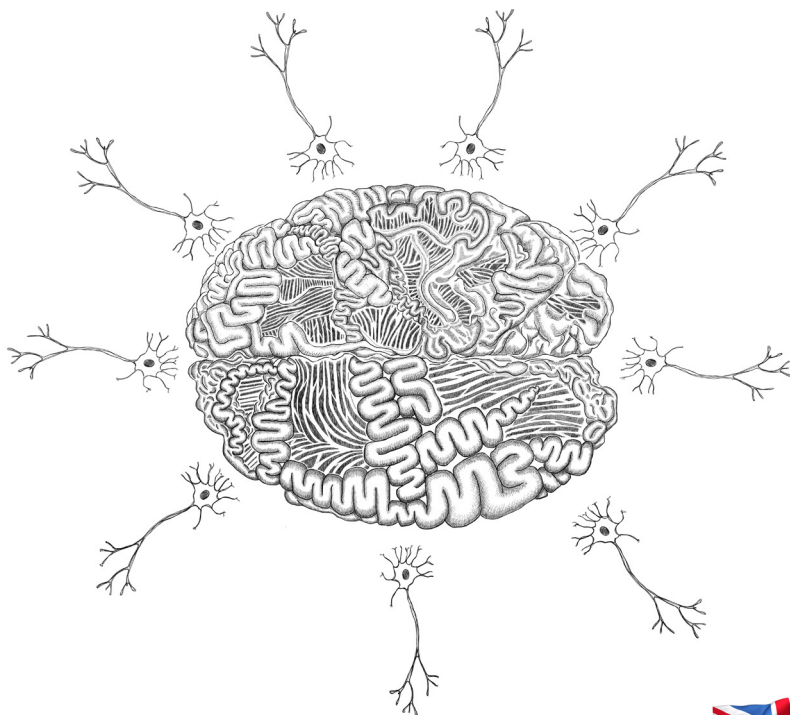
New frontiers for inclusive education

Maeca Garzia - INDIRE • Emanuela Pianese - 1st Grouped Primary and Infants
School of Giuliano

Stories ☐

Tools ☒

Studies ☐



English version

Connections that include

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We would like to thank the teachers who participated in the adult laboratories for Small Schools and who then went back to their classes and experienced the methodology described in this Notebook falling within the series “Tools”. This allowed the methodology to be further specialized and structured in isolated educational contexts and in the internal areas of the country. In particular, special thanks go to Prof. Maura Vaccarelli, whose narrative synthesis of the activity carried out in a multiage class is provided herein in a significant extract.

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The *working library* is an innovative and unique publishing work designed and directed by Mario Lodi.

From 1971 until 1979 the project was managed by a group of educators: Fiorenzo Alfieri, Francesca Colombo, Tullio De Mauro, Caterina Foschi Pini, Alberto Gianola, Angelica Gianola, Roberto Lanterio, Palmira Maccarini, Luciano Manzuoli, Gioacchino Maviglia and Francesco Tonucci.

The working library was an alternative to the schoolbook. The format should be functional to teacher's activities. They collected 80 issues of “Documents”, “Letters”, “Guides” and 68 sheets with ideas, activities and practical tips for teachers so as they can use according to the classroom needs.

A sort of collection of good practices experienced in Italy. A catalogue that teachers, parents and students can use in every social and geographical situation. Learning activities that have a different approach to the traditional lessons and use tools for effective teaching activities. Mario Lodi and his colleagues wished that students' families and teachers know them.

Everybody wants a better school, a warm and scientifically correct place where the students' experience comes first. The working library had this goal.

Cosetta Lodi

President of Casa delle Arti e del Gioco

<http://www.casadelleartiedelgioco.it>

After so many years from the *working library*, the idea of creating a better school is still alive. Today's model of schooling is still a traditional one, which is difficult to remove from the daily practices and belongs to the image of the standard school.

Indire main goal is to give support and highlight teachers' research activity to "learning experiences, classroom organisation and learning environment that foster the students' autonomy so as they can develop permanent competences and skills" (*Indicazioni Nazionali. Nuovi scenari*, 2017).

The tools in Lodi's *working library* were effective because they used a clear and simple language, essential format, a research work that came from teachers' daily activity. The tools contributed to disseminate innovative teaching method based on the active learning and an inclusive and democratic school model.

Documentation and teaching methods offered in the *working library* allowed teachers to practice and experience innovative pedagogy.

The *Small Schools' Notebooks*, divided into "Stories", "Tools" and "Studies", wishes to pay homage to this experience that is a good practice of research and innovation in schools.

We wish to thank to Mario Lodi's heirs to allow us to use and re-think to the *Working Library*. We also wish to thank to Grandi & Associati which collaborated to the editorial activity and publishing of this volume.

Research team - INDIRE Small Schools
<http://piccolescuole.indire.it>

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1. Let's begin...

Every single school is currently required to self-assess its system by filling in a Self-Assessment Report (RAV – Rapporto di Autovalutazione) and an Improvement Plan (PdM – Piano di Miglioramento) with the aim to develop a sustainable and effective Three-Year Educational Offer Plan (PTOF – Piano Triennale dell'Offerta Formativa), also in a Social Report perspective.

There is only ONE FOCUS: THE STUDENTS' RESULTS. Hence, the watchwords are: improvement of performances, fight against school dropout, continuity between school years, significant learning and lifelong learning, implementation of methodologies and strategies that assure educational success, social cohesion, territorial connection and personnel's training.

...In addition, there is also the National Plan for Digital Education (PNSD – Piano Nazionale per la Scuola Digitale):

1. promotion of innovative scenarios for the development of applied digital skills;
2. promotion of open educational resources and guidelines on the self-production of educational contents;
3. training reinforcement on educational innovation.

This Notebook presents **Competences-Based Spaced Learning (CBSL)**: a method that puts together theory and practice, sets the class in motion, activates students, becomes a driving force for new ways of studying/verifying/promoting metacognition and self-assessment both in big and small schools.

In this Notebook, you will find three acronyms:

- **SL** (Spaced Learning), that is the pure and original method;
- **ESL** (Expanded Spaced Learning), that is the basic structure of the

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method integrated with a phase in which the lesson is expanded (introduced by IISS Majorana of Brindisi);

- **CBSL** (Competences-Based Spaced Learning), with a double expansion of the method through a peculiar **Narrative Synthesis** and **Post-lesson Lines** of development, calibrated on a teaching methodology based on competences (introduced by the 1st Grouped Primary and Infants School of Giugliano in Campania of Naples).

The three methods represent the evolution of an educational practice which, based on a neuroscientific discovery, passed from the Anglo-Saxon culture to the Italian culture, arriving in the Small Schools' world through adult training laboratories¹ carried out within the project dedicated to Small Schools.

1. *The adult laboratory is «a place for learning in group, within a network of relationships, where the passage from doing to thinking takes place, giving meaning to experiences as well as practical basis to thinking».*
From “The adult laboratory in the tradition of the Educational Cooperation Movement” by Maria Teresa Segà

Note

2. The theoretical framework of reference

Competences-Based Spaced Learning (CBSL) is an evolution of **Spaced Learning (SL)**, an educational methodology aimed at storing information quickly in the long-term memory through repetition.

“Repetition is a new way of investigating students’ conscience; in fact, while the main aim during lessons was to identify a common starting point for all students in order to solve problems all together, the aim of repetition, instead, is to get to know the spirit of each student being tested orally. The lesson has a different impact on the single conscience of each listener; gaps, doubts, variations in judgment, “passiveness” remain and differ in each single student’s soul” (Lombardo Radice, G., 1913, page 143 and following).^[1]

Spaced Learning is an educational application linked to the research on neurosciences published in 2005 by R. Douglas Fields^[2] in Scientific American.

The triggering question was: *“how do genes - in a single neuron - know when to strengthen a synaptic pathway?”*. Fields discovered that the key factor for the development of long-term memory is time: repeating three stimulations, alternated with a 10-minute break without stimulations, triggers a reaction that develops a synaptic pathway. This occurs because brain cells switch on and link to each other depending on how they are stimulated: if the stimulation is prolonged, the cells do not switch on; but with a 10-minute break between stimulations, a pathway is created which builds long-term memory.

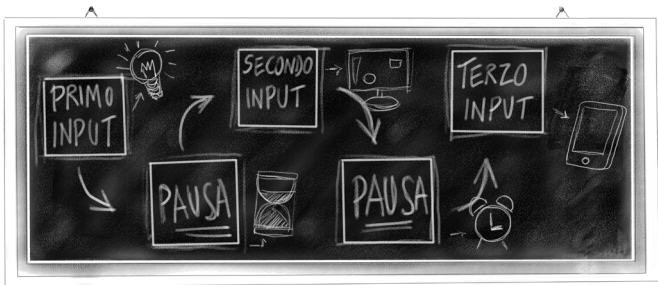
Note

[1] Lombardo Radice, G., (1913). *Lezioni di didattica e ricordi di Esperienza Magistrale.* Palermo: Sandron.

[2] Fields, R.D. (2005). *Making memories stick.* Scientific American, 292, 58-65.

2.1 The genesis of the method: from Spaced Learning to Competences-Based Spaced Learning

Based on Fields’s neuroscientific discovery, Paul Kelly (2008)^[3] - at the time head of the Monkseaton High School in Northern England – along with some of the school’s teachers, developed the «*Spaced Learning*» method, a traditional educational technique of transmissive type, characterized though by a peculiar way of organizing time during the lesson based on three input sessions and two breaks.



The phases of a lesson based on Spaced Learning mode

In the first input session, the teacher provides the information that the students are to gain from the lesson. In this phase, it is important to deliver essential contents with a technical language that characterizes the topic being covered. The length of this input is not predetermined, although it has been observed that it is difficult to hold students’ attention for more than 10-15 minutes. Neuronal pathways start the process of creating memories in this session.

This first phase is followed by a 10-minute break in which no references to the topics of the lesson must be made. During this break

Note

and the following one, it is important to avoid stimulating the memory pathways that are being formed. Therefore, the activity must have nothing to do with what the students are learning, so as to increase the possibilities for the neuronal pathway “to rest” and form stronger connections. To ask the students, especially the older ones, “*what they want to do*” can be the trump card in this situation.

During the second input session, the teacher revisits the content of the first session recalling the key topics, thus calling them back to mind, but changes the way of presenting said content (by using different examples and/or examples characterized by high interactivity or by using videos). This stimulates the same neuronal pathways of the first input, thus communicating their importance to the brain. In this phase, the same topic is covered by providing different examples or by leaving out key information in order to see what the students remember about the contents of the first input. For example, if the lesson in the first input is supported with a conceptual map, in the second input the students can visualize the same map characterized by empty spaces that they have to fill in with the lacking key information. It is important to remove the information that the students are to acquire, since their attention will be focused on that specific piece of information when asked to recall it. Or, if in the first input the teacher presents the topic with slides (for example, using Microsoft PowerPoint), in the second input the teacher can project a video reproposing the topic in a contextualized manner. “*The lesson is not a single educational act, but a cycle of acts. Once a topic has been explained, even with the greatest freshness and liveliness, it has not been acquired yet. It is acquired through repetitions, which are nothing more and nothing less than new lessons, in which the same problems are presented in a different way compared to the first time, because the students’ minds are better disposed given the recent preparation. In the real school, repetition is only apparent; in actual fact, a redoing takes place, because the concepts are studied more in depth, discovering the great richness of relations*” (Lombardo Radice, G., 1913, page 143 and following)^[1].

Note

[1] Lombardo Radice, G., (1913). *Lezioni di didattica e ricordi di Esperienza Magistrale*. Palermo: Sandron.

In the second break, the same principles apply as for the first break, with another 10 minutes to rest/relax. The activity carried out during this break can be a variation of the activity carried out during the previous one; the important thing is that it must be unrelated to the lesson.

In the third input session, the teacher remains on the content of the first session, but proposes activities centered on the students, who have to demonstrate to have acquired and understood the content shared in the first two inputs by applying the knowledge acquired in exercises or problem situations, or simply by answering multiple-choice questions, as in the Anglo-Saxon model. In this phase, the teacher simply goes around the class, verifying that the students have truly understood the content of the lesson.

The key words of the three input sessions of a lesson based on Spaced Learning are: to present, to remember and to understand information, respectively.

When managing the breaks, that is the moments of distraction provided for by the methodology, it is important to avoid stimulating the memory pathways being formed.

Therefore, the activity proposed must have nothing in common with what the students are learning. The most effective way to achieve such objective is to have the students perform coordination activities, as these require the use of parts of the brain involved in balance and movement, and are thus not used during the learning phase of the lesson. This enables the neuronal pathway “to rest” and create stronger connections. Some activities that can be proposed are: origami, paper-cutting activities, musical activities, play-dough modelling, light aerobics, ball-handling games, group dances.

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Examples of different ways of managing the breaks

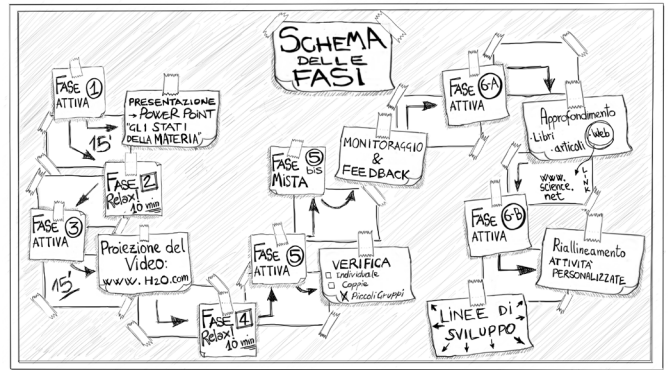
Generally speaking, the original method uses activities congenial to primary school students in schools of all orders and grades. However, if we asked the secondary school students “what they really want to do”, we would understand that play-dough modelling or origami are considered too childish. The activities more suitable for adolescents could imply, for example, the use of technology. In some cases, during the breaks, simulations in immersive virtual environments could be carried out as a further opportunity to use the technologies present in the classroom or outside of the classroom.

The adaptation of the method to the Italian culture and school system entailed its necessary variation, promoted and realized by IISS “Ettore Majorana” of Brindisi, which developed a flexible model that can be applied with related adjustments to the single school contexts.

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The adjustments introduced with regard to the original model gave life to the ESL method (Expanded Spaced Learning)¹, with the aim to safeguard the learning of the single student and verify the suitability of the path planned by the teacher for the students. In fact, the ESL method gives the teacher the possibility, owing to an educational assessment, to decide whether to recalibrate the lesson by lingering upon more difficult passages, to continue with an in-depth study or an alignment, to carry out personalized recovery lessons. Therefore, this expanded version of the method also includes Realignment and In-depth Study phases (Caprino, Garzia, Tosi, Moscato, 2016)^[5].

Over the years, in the perspective of continuous improvement, the need was felt to further modify the method with the aim to give a more marked impulse to the development of competences, in order to avoid reaching a deadlock in ESL lessons by concentrating exclusively on the development of skills and knowledge. Therefore, the 1st Grouped Primary and Infants School of Giugliano in Campania introduced the CBSL method, in which the planning of the work units based on ESL was inserted in the wider framework of learning units based on competences, which the school decided to divide into two-month periods.



Example of a workflow of a lesson planned according to the CBSL method

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The school carried out a three-year period of experimentation during which the experiences were collected through a specific format of **Narrative Synthesis** and post-lesson **Lines of Development**².

Both tools were integral part of the experimentation of the method implemented in experimental groups and control groups. The **Narrative Synthesis** is a sort of journal functional to pay attention and keep in mind what happens during and after a lesson based on the CBSL method. The strength of this document lies in the fact that the narration concerns not only what happened to the students, how they acted in and reacted to each phase provided for by the workflow, but it also pays attention to the teachers who narrate themselves, learn how to use the method which they gradually personalize based on themselves and their students. The method works when what planned and what put into action work together, the method works when it falls within the educational routine and meets the students' and the teachers' needs.

The **Narrative Synthesis** (cf. Annex No.1) begins with a "declarative" phase which describes the key competences/disciplinary specifications that the CBSL method intends to spur. It completes the kit providing a critical-narrative key related to each phase of the method, thus allowing the latter to be replicable by other teachers. The format ends by expressing the **Lines of Development** (cf. Annex No. 2) which describe the activities to be carried out, the initiatives to be organized, the paths to be undertaken, both laboratory and not, based on the knowledge and skills spurred by the CBSL lesson and to be implemented in following moments.

The **Lines of Development** are a very fertile ground that allow strengthening the above-mentioned competences, and keeping the students busy for one or two months after the actual lesson. Furthermore, they allow planning other interventions that can cultivate social skills, citizenship competences or also multidisciplinary connections that can be supervised by the experimenting teacher or by the course

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1. ESL enriches the Gallery of Ideas of the Educational Avant-guard Movement <http://innovazione.indire.it/avanguardieeducative/>

[4] Caprino, F., Garzia, M., Tosi, L., Moscato, G. et al. (a cura di), "Avanguardie educative". Linee guida per l'implementazione dell'idea "Spaced learning (Apprendimento Intervallato)", versione 1.0 [2015-2016], Indire, Firenze 2016.

2. <https://www.primocircolodidattico.edu.it/index.php/esl-materiale-informativo>

colleagues. This allows, on the one hand, widening the students’ horizons, and on the other hand leading them to cognitive transfer and to putting into practice specific or key competences.

The experimentation of the CBSL method taught teachers how to take a step back and leave greater space of maneuver to students: *“many times the lines of development identified by the students were much more interesting, productive, creative, unexpected than those identified by the teacher. It is exactly on such field that the students measure themselves with the acquisition and implementation of competences and, especially, develop significant learning”* (Emanuela Pianese).

The **Lines of Development** are the ideal moment to implement the stakeholder engagement and develop a practical cooperation with the territory, whose resources become very precious allies in this phase.

Today more than ever, to make use of the territory understood both as “places” and as experiential, professional, amateurish resources, is an unmissable driving force for the educational world.

Note

3. CBSL in Small Schools

Are the community and the territory important values for a school that wants to offer its students quality service, assuring high-level education and significant learning also capable of preventing school drop-out and unsuccess?

The answer could be rhetorical, but in the small schools’ reality both the community and the territory assume special meaning because the knowledge bonds typical of small communities are to be cultivated and taken as virtuous example. In the big cities they are by now a distant memory, even if in the last years - and in the last months due to the COVID-19 emergency - schools in the cities have been working in the attempt to rebuild the sense of belonging to the territory and especially the sense of a community in which to identify educational values. Small Schools have the advantage of being based on genuine bonds between people and with the territory; bonds and interweaving that become the heart of the school, a school that goes out onto the territory, and a territory that enters the school.

The CBSL method gives teachers a matchless planning tool. Therefore, when choosing the topic of the lesson, it is strongly advisable for teachers to be connected to their territory’s reality, while not losing sight of the wider and more global community to which they need to conduct their students. Indeed, this characteristic makes CBSL more functional for Small Schools: the method widens the real and virtual horizons of both students and teachers, and becomes a tool through which it possible to demolish the risk of isolation and closure, often typical of small schools; it can cultivate and implement the sense of community starting from the community-class, passing through the community-school and reaching the combination school-territory.

Note

How can CBSL be functional to students and teachers that regularly experience multiage classes?

Working in a multiage class requires an excellent management of time, space and human resources. It requires the use of a spiral curriculum in order to harmonize, at least in part, the paths of students of different ages; it requires a mixture of tradition and innovation; it aims at creating study groups composed of students of different ages, here defined as “vertical groups” (Garzia, Pianese, 2020)^[5]. In order to work in a multiage class, it is necessary to develop personalized learning paths and teaching processes. That is the only way for students to be able to learn how to be participants in and protagonists of their learning (Amenta, 2013)^[6], to develop meta-competences also through strategies based on cooperative learning and peer tutoring, which spur positive interdependence and foster the development of social competences. Last, but not least, it is worth mentioning Vygotsky’s Zone of Proximal Development³ (Vygotsky, 2001)^[7], which finds very fertile ground in multiage classes. The potential upcoming development refers to this moment, to what the student will soon become owing to individual-context dynamics. The areas of the upcoming development have different levels of functional efficiency for each single student; once diagnosed the maximum level of the upcoming development for each student in each single area, the multiage class teacher can easily carry out activities that do not go below the students’ individual basis – thus do not result boring and do not cause regressions - or that do not go way beyond the students’ individual maximum level.

CBSL is a methodology strongly supportive of what described above because, once identified a core topic, it allows carrying out a lesson with the entire class group calibrating tests and in-depth study inputs in a personalized manner, or on the basis of age, and taking into consideration the level of competences/skills that characterize the group of students.

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3. The difference between the current level of development and the potential level of development that can be reached through other people’s help.

[5] Garzia, M., Pianese, E. (2020). *Formare nelle Piccole Scuole. FORMAZIONE & INSEGNAMENTO. Rivista internazionale di Scienze dell’educazione e della formazione*, 18(1), 233-243.

[6] Amenta, G. (2013). *Apprendimento*. In G. Bertagna, P. Triani (eds.). *Dizionario di didattica*. Brescia: La Scuola.

[7] Vygotsky, L. (2001). *Pensiero e linguaggio. Ricerche psicologiche*. In L. Mecacci (a cura di). Roma-Bari, Laterza.



Different ways of giving feedback on a same topic by two different age groups of students composing a primary school multiage class

Competences-Based Spaced Learning is a precious tool to produce vertical continuity in schools and to achieve inclusive teaching.

Indeed, already in its original version, Spaced Learning responds to the difficulties of many students who, at all educational levels, express greater or lesser difficulty in listening and on concentrating in general. Such response is due to its method based on structured repetition divided by short breaks, which helps store information in the long-term memory. Based on researches conducted on the effectiveness of the method, results have shown that a one-hour lesson in such modality has a greater impact on students and allows them to learn much more quickly compared to many hours of the traditional lesson. The method has proven to be interesting due to its potential to help students prepare for exams, make up after falling behind, memorize information, as well as its ability to reduce discipline problems and scarce commitment in studying; furthermore, the fact that the presentations are delivered by the students has proven to be supportive for those with learning and cognitive disabilities, as well as for those who do not know the Italian language well.

Note

Based on some teachers' experiences, Spaced Learning has resulted to be particularly congenial to hold the students' attention during two consecutive hours of lesson and/or during the last hours of lesson, when the traditional teaching methodology does not work that well.

“As reasserted various times, CBSL is a strongly inclusive method due to the fact that it responds to and meets the various prevailing cognitive styles. In this view, teachers are automatically more willing and eased to carry out a cognitive map of their class, something which is extremely useful in our profession regardless of the use of the method” (Emanuela Pianese).

Given the particular structure of a lesson based on the CBSL method, which is enhanced compared to the method from which it originates, all sensory channels - visual/verbal, visual/non-verbal, auditory and kinesthetic - for accessing information are further spurred.

It is clear that such openness finds corroboration in the different cognitive styles, also meeting the needs of students with learning difficulties, students for whom Italian is an L2 language (very frequent in the territories where the small schools are located), or also students with learning disabilities. A CBSL lesson automatically becomes a compensative measure, it helps develop the democracy of learning, preventing students with special educational needs from feeling recipients of diversified interventions compared to their classmates. If the quality of school is measured based on the ability to develop inclusive learning processes and on offering suitable and effective responses to all and each one, this means that to adopt CBSL contributes to making a substantial step forwards in this sense.

Note



Example of participation in a lesson based on the CBSL method in a multicultural class

The continuous and never-ending research for quality in inclusion should be equal to the research for quality in everyday teaching. In fact, the transformation of the teaching methodology and the use of the CBSL methodology, in order to ensure the educational success of particular “categories” of students, are an opportunity for a generalized improvement of the teaching quality.

It is worth highlighting that the methodological renewal expressed by the most recent guidelines with regard to inclusion, besides meeting the “special” needs of students with learning disabilities, successfully involves all the students of the class. The idea of inclusion, implied in the method proposed in this Notebook, is based on the fact of recognizing the importance of the full participation of all subjects in the school life. *Inclusion* thus becomes a *process*, a framework within which *all conditions can be enhanced, respected and provided with opportunities at school*.

“The notion of inclusion asserts the importance of all the students’ involvement in creating a truly welcoming school, also through the transformation of the curriculum and of the organizational strategies, that have to become sensitive to all the various differences present among students” (Dovigo, 2007)^[8].

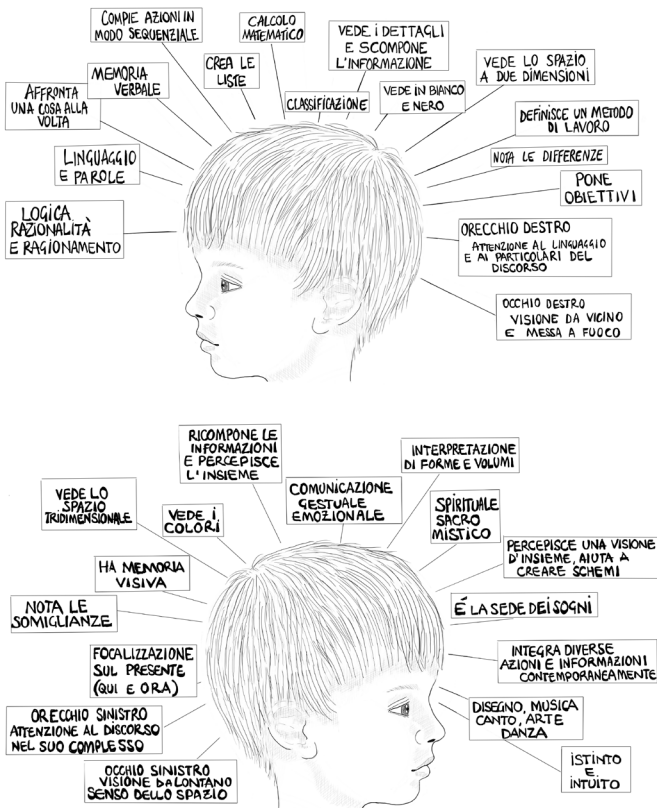
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[8] Dovigo, F. (2007). *Fare differenze. Indicatori per l’inclusione scolastica degli alunni con bisogni educativi speciali*. Erickson.

Basically, to adopt CBSL means to suitably respond to all individual differences, not only to students with special educational needs; this is possible because it is a method that allows creating a school without barriers, that enhances personal specificities and facilitates social participation and learning. At the same time, it facilitates teaching and learning dynamics also in multiage classes, which represent the place *par excellence* where educational personalization strategies need to be put into action.

Inclusion, as internal resource of each class, as idea, as key principle, highlights the need to have an increasing knowledge of the students, fostering, especially in contexts where different age brackets are present in class, the important process of enhancing “personal excellence” (Garcia Hoz, 2005)^[9].

Experimenting the method through the training led each Small Schools teacher involved to reflect in depth on the learning processes of each student: “How does each student learn?”, “How does the brain work when learning?” (Gabrieli et al., 1997)^[10]; as well as on teaching processes: “What is my teaching style?”, “How much do I know my students and their learning processes?”, “Can I manage to experiment/use different strategies to foster learning in all my students?”. Even in this case, CBSL – with its neuroscientific basis – answered those questions.



The areas of the two cerebral hemispheres in control of the different cognitive and emotional functions

In order to foster the inclusiveness of the method, several exemplary expedients are provided below.

- *Pay attention to the inclusive dimension at project level:* during the micro-planning of the lesson based on the CBSL method, it is important to plan the input sessions and the break activities paying attention to the possible active participation of students with spe-

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[9] Garcia Hoz, V.(2005). *L'educazione personalizzata*. Brescia: La Scuola.

[10] Gabrieli, J.D.E., Brewer, J.B., Desmond, J.E. & Glover, G.H. (1997). *Separate neural bases of two fundamental memory processes in the human medial temporal lobe*. *Science* 276, 264-6.

cial educational needs and of all age brackets, in the case of multi-age classes. In this critical juncture, the use of technology in the peculiar organization of the methodology would be a valid help. In fact, planning the breaks taking into consideration the use of technology in a suitable and creative way, can produce moments of easy integration of the disabled students within the class group. Furthermore, it is necessary to assure the accessibility and usability of tools and environments used to support teaching and learning processes, as a necessary condition for the good outcome of a lesson based on the CBSL method.

- *Pay attention to the inclusive dimension at educational and organizational level also with respect to students with special educational needs:* various inclusive strategies are implemented in the educational model, starting from the setting of the classroom according to the CBSL methodology, up to the use of technologies, elements that foster participation in the educational activity of disabled students and/or with learning disabilities. It is also important to differentiate educational objectives and strategies, feedback modalities during the assessment in order to respond, even with suitable resources, to the various individual or group specificities.
- *Specification of the level of involvement expected from the single student, the class, the school, the family and the territory...*

Note

4. CBSL beyond the class

The various years of experimentation at the 1st Grouped Primary and Infants School of Giuliano in Campania of Naples of the CBSL method and of the Lessons' **Lines of Development** have given the possibility to verify and monitor a greater involvement of teachers – also between teachers – and of the educating community. This aspect also derives from the best practice of co-planning the CBSL lesson modules with the aim to extend its benefits to several disciplines. The main objective is not as much multi-disciplinarity, but interdisciplinarity.

As mentioned, the use of multiplatform collaborative software, learning platforms or general repositories, allows teachers to share the lessons and activities carried out according to the CBSL method, as well as their related experiences and paths. This facilitates the teachers' planning work as they can make use of lesson kits experimented by colleagues of the same discipline or related to transversal fields and topics. In addition, teachers acquire greater familiarity in planning interventions and, especially, a strong and necessary attention towards the students' different learning styles.

The strongly enhancing experience in using the CBSL method goes beyond the class, especially when the lesson kit is used by the students to present the topic in other classes of the school. Indeed, this triggers a powerful virtuous circle that spurs the acquisition of further competences. In fact, the students are accompanied and driven to acquire a new way of studying which goes beyond the oral test and/or verification test and concerns the pleasure and responsibility of learning also so as to spread culture.

Culture is spread when learning becomes significant because co-developed and given sense and value: *“We want to share this image as it derives from the pleasure of having observed, over the years, groups*

Note

of students that acquired familiarity with the method and related technologies: it is necessary to cultivate beauty in our schools and it can be cultivated if there is beauty around them. It is incredibly beautiful to see groups of students at work, who often also modify a lesson kit prepared by the teacher according to what is more congenial to them, with the aim to make it usable for students of other classes, not always of their same age. It is extremely beautiful to see them work autonomously, dividing tasks among themselves and organizing the visits strategically. It is extremely beautiful to see them arrive in class and not only comment their performances highlighting strengths and weakness, but especially evaluate the interest, the participation of their peers and of the teachers that they met in the hosting classes” (Emanuela Pianese). Mastering the protocols of a lesson based on the CBSL method also allows students to modify and vary the management and the form of class interrogations. For example, during a class interrogation, they used a PowerPoint presentation that had been created for the experimentation. It is very interesting to see how, starting from the words or key concepts used in the presentation, each student manages to reconstruct a speech that has sense connected to the succession of slides (and it is superfluous to reassert how such a support is fundamental for students with special educational needs). In other cases, the students totally changed the presentations, replaced the videos suggested by the teacher with others found on the Internet autonomously (a parallel path is always highly recommended, such as the one organized by the Ministry of Education, University and Research with the paths “Connected Generations” provided for by the Safer Internet Centre). Lastly, the students also self-produced lessons and multimedia contents with topics suggested by the teacher and presented by the students (even not strictly related to the curriculum topics of the academic year).

“During the years of experimentation, we also verified with pleasure that students leaving the primary school and starting the secondary school took the CBSL experience with them and proposed it to the new

Note

teachers; on the one hand, this testifies the goodness of the method in itself, and on the other hand it leads us to a consideration: educational and didactics continuity is not only connected to teachers, but it can and must be carried out also by the students who become masters and supporters of strategies and methodologies that result functional to their learning” (Emanuela Pianese).

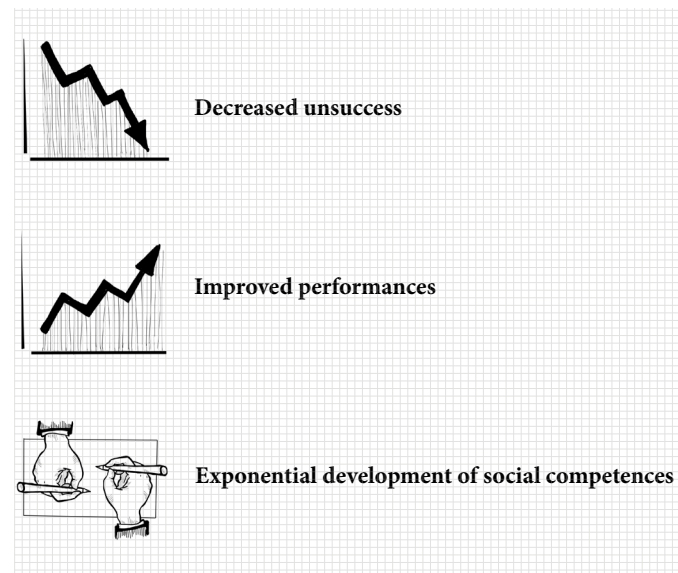
In the many years in which this method was experimented in the school where the teacher involved as trainer in the “Small Schools” Laboratory works - to whom the quotes in italic refer in this text - the CBSL method has had an impact also on families. “Even in this case, we would like to share an image, a strong impression which we were suggested by one of those families: a lesson based on CBSL becomes a modern “hearth and home”. This takes place when the lesson arrives also at home thanks to sharing – in our case through the electronic class register; it becomes an opportunity for an exchange of views and family bond on cultural topics, it becomes a special opportunity for inverting roles, because it is the child or kid that holds a lesson for family members, leading them in a journey and along a path that he/she has already experimented and of which he/she masters the related knowledge and skills. The literature of the sector teaches us that it is when I explain a lesson to others that I make it mine, I reprocess it, I connect it to my pre-knowledge and fix it in my map. Families often comment with pleasure the fact that they brushed up old knowledge that had been hushed, or that they acquired new knowledge never covered in their educational path. There have also been mothers and fathers or older siblings that carried out the verification tests provided in the lesson kit. Such experience, in turn, gave them ideas, initiatives, or the desire to dedicate some time to the class with regard to the paths provided for by the lines of development...” (Emanuela Pianese).

Note

5. The method's educational benefits with regard to the development of competences

Especially if used along with Cooperative Learning and Peer Tutoring, CBSL is a methodology that strongly supports didactics based on competences, in particular in the phases of expansion and in-depth study. Among the most impacting effects of this method, we here recall:

on students



Note



Ability to carry out in-depth study autonomously



Activation of the class

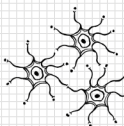


Solid and significant learning



Activation of metacognitive processes and self-assessment

on teachers



Greater attention to cognitive and teaching styles



Cooperation among colleagues



Shared planning

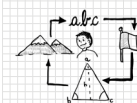
Note



More time to observe cognitive and social processes and dynamics



Greater attention in planning and a planning centered on the class



Spur towards planning transversal and multidisciplinary lessons, with a strong interdisciplinary imprint

Even if the development of competences is connected to the effects of the method, such development is a long and complex process that has to be carried out gradually.

CBSL is a driving force for a significant acquisition of competences and for putting them into practice. In particular, competences are implemented in the recovery/in-depth study phase, but especially in the phases following the realization of the lesson, that is with the Lines of Development. An open attitude towards novelties, availability towards life-long learning, autonomous initiatives, responsibility and flexibility are all aspects identified in the students who experienced the method.

Regardless of the disciplinary contents specific of and belonging to the topic object of the lesson, we here want to highlight the value of the CBSL methodology in the implementation of key competences, such as:

- *functional alphabetic competence;*
- *digital competence;*

Note

4. RECOMMENDATION
OF THE COUNCIL
of the European Union
of 22 May 2018 on key
competences for long-life learning.
Official Journal
of the European Union.

- **personal and social competence, and ability in learning to learn;**
- **entrepreneurial competence;**
- **metacognitive competence.**

The **functional alphabetic competence** includes communication in mother tongue («the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions, both in oral form and in written form, using visual, sonorous and digital materials», that is the ability «to communicate and to enter into relationships») and in foreign languages («the ability to use different languages in a suitable and effective manner with the aim to communicate»).

According to the European Recommendation⁴, our students – future adult European citizens – should be putting into practice, from the very first years of school, the ability to communicate orally and in written form in a series of situations, and they should especially be able to adapt their communication to the situation in which they find themselves. This competence, which has to be cultivated and trained, also comprises the ability to distinguish and use different types of sources, to search, gather and process information, to use computer aids and not only, to formulate and express lines of reasoning in a convincing manner, suitable to the context. Along with this macro competence, there is critical thinking and the ability to evaluate information and use it in a suitable and coherent way.

It follows that CBSL is a very precious ally for the development of such a relevant competence.

The concept of **digital competence** - implied also in the planning, realization, and use of a lesson based on the CBSL method - highlights the coexistence of dimensions that are more marked from three different points of view integrated among each other:

- **the technological point of view** (to know how to explore and face problems and new technological contexts with flexibility);
- **the cognitive point of view** (to know how to read, select, interpret and evaluate data and information based on pertinence and reliability);

Note

- **the ethical point of view** (to know how to interact with other subjects in a constructive and responsible way, making use of technologies);
- **integration of the three dimensions – technological, cognitive and ethical** (to know how to understand the potential offered by technologies in sharing information and the collaborative development of new knowledge).

Personal and social competence, instead, concerns *knowing how to be* involved in the various phases of the CBSL method, implying the ability of **learning to learn** which is embodied in the metacognitive competence and in a healthy and effective approach towards study.

The entrepreneurial competence, often defined as citizenship competence, comprises the ability to plan, communicate, collaborate (also during the breaks of the method), act autonomously and responsibly, solve problems, identify connections and relationships, acquire and interpret information.

The metacognitive competence comprises the ability to use knowledge and skills effectively and efficiently, duly selected based on the task to carry out, reprocessing and reorganizing in a situation-problem what has been learned; the ability to reflect on one's learning paths identifying strengths and weakness; knowledge of one's personal predominant cognitive style.

It embodies the “*learning to learn*” which, as mentioned, fuels personal and social competence, expressing itself in metacognitive competence.

Basically, CBSL changes the way of “doing school”, allowing all students **to learn in a significant, autonomous and responsible way**, to do research and **to be curious**, to formulate hypotheses, to collaborate, to face and solve problems together, as well as to plan other paths autonomously in the wake of those proposed by the teacher during the lesson. In particular, CBSL enables developing in students the habit to work together: organized in groups, they learn how to ask ques-

Note

tions and give answers, they get used to making decisions, to exchange opinions in a constructive manner, to help each other, to assume responsibilities. Each student finds the way and space to learn according to how it is more congenial for him/her, in the way most satisfying and significant. By bringing into play the potential characteristics and qualities of each one, CBSL allows enhancing the excellences and not depressing students who are weaker or who have significant learning disabilities. It enables each student, also in multiage classes, to feel recognized in his/her individuality as a **matchless** and **unique person**.

Note

6. The Handbook: how to develop and carry out a lesson based on the CBSL method

The CBSL methodology is congenial to all school years of all orders and grades, without particular limits with regard to the number of students that can be involved. Highly inclusive, it meets the different learning cognitive styles and is particularly effective in managing multiage classes. Cooperative Learning, Peer Tutoring and Neuro-Linguistic Programming can strengthen the effects of Spaced Learning with a strategic use of didactics based on competences.

In fact, the original method was strengthened by introducing elements of Neuro-Linguistic Programming (in the presentation phase of the topic), Peer Tutoring (in the alignment/in-depth study phase) and Cooperative Learning to accompany and support the educational routine.

NLP⁵ connects neurosciences to cognitive theories, recalling a series of elements such as outer behaviors, language, mental processes. It involves the space that separates the teacher from his/her pupils, and it is fundamental both in the planning phase of a lesson kit and during the first input session when the topic is presented.

Everything the teacher does transmits a message to students: words used, facial expressions, the way the teacher stands, moves, physically organizes the classroom.

During the presentation of the key topic of a lesson based on the CBSL method, it is very important to prepare what in NLP⁵ is called “anchoring”.

Note

5. NLP is the acronym for Neuro-Linguistic Programming

Anchoring is one of the most used NLP techniques, especially with students with educational special needs, as it is the process through which things are anchored to each other. It allows quickly re-accessing a resource stored in memory.

In CBSL, emotional, kinesthetic, spatial and auditory anchoring are very functional.

During the lesson, another precious ally is “calibration”, that is the process that allows grasping immediate feedback from the students (expressions, body language, eye movements...) in order to re-orient the lesson continuously and make it more effective.

Therefore, a lesson based on the CBSL method becomes more fruitful if it is based on Neurolinguistic Programming guidelines. Hence, it is important to associate a careful planning with the students’ personal knowledge and with a consolidated procedure based on the use of observation and mapping protocols of cognitive styles.

With regard to the use of Cooperative Learning and Peer Tutoring associated with CBSL, it is worth highlighting that the former is very much indicated during the “Training Assessment” and “In-depth study” phases, while the latter is perfect in the “Realignment” phase and also in the “Lines of Development” of the lesson⁶. Both modalities allow activating the class and therefore concur to significant learning and growth in students.

The fluidity in carrying out a CBSL lesson requires an initial meticulous micro-programming where nothing is left to chance. When the students arrive in class, everything must have already been organized: environment, seating, technologies, ways of presenting the contents, materials and tools aimed at learning and at the efficient management of the breaks. The use of multiplatform collaborative software, learning platforms or general repositories allow students to access the contents presented by the teacher also at home. In this way, they can have a continuous resource to which to refer when necessary, and also other teachers of the same discipline can benefit from such contents.

Note

6.1 The phases of the CBSL method

The sequence of a lesson based on the CBSL method is as follows.

- **1-Active phase:** viewing of a presentation or something similar (15 minutes);
- **2-Relax phase:** break (10 minutes);
- **3-Active phase:** projection of a video or something similar (15 minutes);
- **4-Relax phase:** break (10 minutes);
- **5a-Active phase:** check/educational assessment (individual, in couple, in small cooperative groups);
- **5b-Mixed phase/monitoring:** immediate feedback right after the assessment/break;
- **6a-Active phase:** in-depth study. A topic is proposed with a different asset and/or personalized, giving the opportunity to reprocess concepts in a different way and with other languages. The students are spurred to search for further information that can integrate the information delivered (from the web, from books proposed in class, from articles of the sector...);
- **6b-Active phase:** realignment (to be activated if the monitoring phase highlights an inadequate level in the students’ performance). In this phase, it is necessary to decide whether the lesson needs to be recalibrated lingering upon more difficult passages, possibly carrying out personalized recovery activities;
- **Drawing up of the Lines of Development** in the days following the CBSL lesson: the narrative synthesis has to be detailed, as described hereafter.

Note

6. Cf. Image paragraph 2.1 "Example of the workflow of a lesson planned based on the CBSL method" and paragraph 6.1.

LINES OF DEVELOPMENT⁷

- Real or laboratory-realistic experiences
- Multidisciplinary connections – also with other colleagues
- Dissemination in other classes
- Autonomous production of contents (traditional/digital)
- Reuse of the presentation in managing class interrogations which become debates and mini-conferences conducted by the students themselves

Workflow for planning a lesson:

- **I gather** the ideas and conceptual bonds of the topic that I intend to propose in a map or in a flowchart;
- **I go** in search of videos;
- **I realign** the map;
- **I proceed** in delivering the presentation;
- **I develop** the verification test completed with criteria for giving scores/marks;
- **I formalize** everything by filling in the template.

7. (cfr. Annex no. 2)

8. The template is available at the following link:
http://innovazione.indire.it/avanguardieeducative/login#/group_materiali_condivisi

6.2 The Lesson Kit

What is a lesson kit according to the CBSL method?

It can be defined as a *toolkit* containing:

1. the **planning template**⁸ (that can be provided with links to selected videos to be projected in the active phase 3);
2. a **PowerPoint presentation** (or something similar);
3. the **verification test** to be proposed to the students completed with the scores/marks criteria;

Note

4. the **Narrative Synthesis** (see Annex no. 1) completed with the **Lines of Development** (see Annex no. 2).

6.3 The resources and competences required

In order for a CBSL lesson to be effortless, teachers are required to have digital competences, that is they have to know how to use specific tools aimed at optimizing the implementation of the educational strategy. In fact, should the methodology be used with the support of technology (this is not mandatory, but recommended), teachers are required to be in possession of digital competences, that is:

- technical skills;
- skills in understanding technology;
- skills in using PowerPoint and/or software in order to process conceptual maps;
- skills in using the Multimedia Interactive Whiteboard (MIW);
- skills in using and managing multiplatform collaborative software (should it be decided to connect the MIW or one's PC to the students' personal devices or to those provided by the school).

6.4 Congenial environments and tools

As mentioned, CBSL does not require the use of technology which can anyway greatly facilitate the implementation of the methodology. Therefore, the ideal classroom environments when using this methodology are: classroom 3.0, TEAL, nested tables in groups, traditional classroom with MIW or video projector.

Note

Among the tools and environments that can be used, we here recall:

- IMW or whiteboard with video projector;
- personal tablets or devices connected to the IMW through multi-platform collaborative software;
- in alternative, nested tables in groups with interaction/projection screen in case of group activities;
- individual seating and/or nested tables in groups (the ideal is to have seats/tables that can be recomposed) with possible one-to-one personal devices or provided by the school (for the verification test/final assessment).

Note

7. An excerpt of a Narrative Synthesis

Among the educational experiences documented by the two groups of teachers that participated in the training, various best practices emerged both in the primary school and in the lower secondary school. An annex has been provided herein with an excerpt of a narrative synthesis, titled “The tree of life”, related to a lesson based on the CBSL method carried out in a 1st/2nd/3rd lower secondary multiage class, within the first edition of the adult laboratory for small schools, “Spaced Learning. Breaks are not a loss of time”. This practice was chosen due to its peculiarity: in fact, not only the lesson was carried out in a multiage class, but it also highlights a “best practice” supported by the students who helped the teacher carry out several phases of the method with *peer tutoring* examples.

DESCRIPTION/PRESENTATION OF THE CLASS IN WHICH THE LESSON WAS CARRIED OUT

The class object of the experimentation was a 1st/2nd/3rd multiage class of the school unit of Capestrano belonging to the secondary school of the Comprehensive Institute of Navelli (L’Aquila). It was composed of 11 students, among whom 6 first-year students (3 females and 3 males), 2 second-year female students and 3 third-year students (1 female and 2 males), among whom one student with a back-up teacher.

It was a very united and well-integrated class, since the students had been sharing their educational path since nursery school. They were very curious and active during the lessons, and most of them intervened actively during the presentations asking many questions.

Note

Before beginning the experimentation, the students were submitted the Mariani questionnaire, to understand what was the most widespread learning style: the results highlighted that the class preferred a visual, verbal, analytical and group learning style. At the same time, through a presentation and information letter, the experimentation was introduced to the Headmaster, the families and the students, who immediately showed curiosity and the desire to start the new path.

The experimentation started on Monday, 20th May 2019.

The recipients of the lesson were the first-year students, and the students of the other two classes were actively involved and “used” to support the teacher in presenting the topics covered.

The preparation of the second-year and third-year classes for this lesson was important.

In fact, as homework for Monday 20th May, the second-year students had to repeat the educational unit on Paper, while the third-year students had to repeat topics concerning the Plant Kingdom and the Tree, since the experimenting teacher was a Technology teacher.

PHASE 1: INTRODUCTION

Phase 1 started with the third-year students presenting the Science topics (the Plant Kingdom and the Tree), which they had already studied, to the students of the other two classes. They were guided by the teacher and used the support of a PowerPoint presentation which they helped create. Then, the second-year students covered the Technology topic, talking about “Paper and its production” (studied the year before).

Phase 1 lasted 15 minutes as provided for by the template. The students were always very attentive, participated actively in the lesson, intervened with observations and asked their classmates many questions.

Note

The undersigned, initially perplexed by the complexity in managing three classes together with a new teaching modality, managed not to transmit such doubts to them and to launch herself in the experimentation.

PHASE 2: RELAX

As explained in the presentation, the teacher invited the students to freely take a 15-minute break using an online timer through the MIW, which at the end of the time at disposal rang a simple bell. The students organized themselves autonomously: some played with a ball, others walked along the corridor, others played with their cell phone, and others yet listened to music on YouTube. When the timer rang, the students were called back to order and, even if not very happy to do so, they went back to their desks and others next to the MIW to continue the lesson.

PHASE 3: EXPANSION

Phase 3 lasted 15 minutes. The second-year and third-year students, who had the role of co-teachers, searched for some videos on YouTube (some of which suggested by me):

- science → photosynthesis
(<https://www.youtube.com/watch?v=mr-dH8rAZo0>);
- technology → paper manufacturing process
(https://www.youtube.com/watch?v=u6pUox_XH2g);
- environmental education → paper recycling process (a video made the previous academic year by the second-year students during a guided visit of a paper and cardboard recycle and recovery plant).

The videos arose the first-year students’ curiosity, who watched each video with their hands raised because they wanted to ask the teacher and their older classmates questions.

Note

PHASE 4: RELAX

The first-year students asked to take the break in the IT classroom in order to continue watching the videos on the topic covered. The teacher reminded them, though, that in the relax phase, they were not supposed to continue receiving any input or stimulus connected to the topic of the lesson; they were supposed to think of something else. Therefore, they all directed their attention to online games, music videos or other, with the exception of a girl, usually isolated and quiet, who watched a cartoon on paper and cardboard recycle realized by Comieco (<https://www.youtube.com/watch?v=BtibXkJRUYE>). An online timer was used also in this case, but the 15 minutes were not respected as in phase 2: the teacher had to intervene with firmness.

PHASE 5: CHECK/EDUCATIONAL ASSESSMENT

The verification test lasted 15 minutes and was submitted to small groups (three groups composed of two students each), in which the teacher appointed a spokesperson. After an initial moment of slight complaints and frowns for how they had been grouped - usual couples had been divided - they autonomously sat in front of each other and immediately started to work with enthusiasm. The stronger students supported the weaker ones, and a collaborative and productive atmosphere was developed. The exercises were carried out quickly with no frictions.

The second-year and the third-year students were submitted the verification test as well.

(At the end of the synthesis, the scores/test assessment criteria are provided).

Note

**PHASE 5 BIS: MONITORING
AND IMPROVEMENT/RELAX FOR THE STUDENTS**

The second-year and third-year students corrected, under the teacher’s supervision, the first-year classmates’ tests, sharing and highlighting the strengths of their tests and the few mistakes made, asking for explanations and justifications to their answers. The first-year students were very satisfied of the results obtained, by far better than the ones usually obtained. The teacher also seized the opportunity to assess the second-year and third-year students.

Generally speaking, there was much enthusiasm. The teacher wondered, though, if such enthusiasm was due to the novelty of how the lesson had been proposed and carried out, or to the very positive assessments. Furthermore, the teacher also wondered: should such method become a routine, would the students always manifest such joy, or does any educational strategy risk, sooner or later, to become not very attractive? It will be possible to answer such question in next academic year, after a significant period of experimentation.

PHASE 6: IN-DEPTH STUDY

For the in-depth study phase, as evident from the template, it was chosen to implement 4 topics:

- “paper recycle”;
- “deforestation”;
- “pesticides”;
- “the care of the urban park”.

Each group had the task to develop a topic.

The teacher, who initially let the groups free to choose the topic to cover, realized that it was impossible to reach an agreement and that all groups had focused on the first topic.

Note

Therefore, the topics were assigned through a draw and the deadline was set for Monday, 3 June 2019 (the first lesson available following the experimentation).

LINES OF DEVELOPMENT

The topic covered allowed introducing the Plant Kingdom.

With the support of the lesson, the topics covered were, for example, pollution and the use of pesticides, calling the attention on the importance of trees on our Planet and the importance of recycle in general and of paper recycle specifically.

The students asked to try producing recycled paper. Therefore, on the last day of school, a practical open laboratory will be conducted, in which the entire town of Capetrano is invited to participate.

Note

ANNEX 1

FORMAT OF THE NARRATIVE SYNTHESIS:

“ _____ ”

(experimenting teacher _____)

Key competence	Specific competences	Skills

Description/presentation of the class where the CBSL lesson was carried out:

1. I present the class and «talk about it a little» lingering upon cognitive styles, relational modalities, usual assets, presence of a multiage class...
2. I frame the lesson within a more complex Educational Learning Unit or within a path that I intend to follow, or I connect it to a hint/need of the class group or of the school;
3. I write everything I consider useful in order to provide a complete framework of the group and of the lesson, as well as of the organizational modalities or weaknesses (human, structural...).

Note

PHASE 1

INTRODUCTION PHASE: in this phase, I talk about what happened during the presentation without forgetting about myself.

PHASE 2

RELAX PHASE: every time there is a break, I can talk about what happened and how the students organized themselves, if they respected the timeframe, my observations...

PHASE 3

EXPANSION PHASE: this phase is dedicated to videos or anyway to the second active input; in this phase, I talk about what happened, the students' reactions, the level of the questions asked, observations and anything considered interesting.

PHASE 4

RELAX PHASE: see phase 2.

PHASE 5

CHECK/EDUCATIONAL ASSESSMENT PHASE: I describe how I organized the verification, what was the task, the restrictions, the roles, how I measured it... (based on the measurement in this phase, I understand if it is necessary to realign the lesson in toto, if it is possible to proceed with the peer-to-peer phase).

(In Annex no. 3, the table with the scores/test assessment is provided).

Note

PHASE 5 bis

MONITORING AND IMPROVEMENT PHASE/RELAX FOR THE STUDENTS: in this phase, I talk about how I gave the feedback to the single students or to the groups of students concerning the test just carried out and what I noticed/considered.

PHASE 6a

IN-DEPTH STUDY PHASE: in this phase, I talk about what I proposed and what reactions/actions I triggered in the students; I also talk about how I managed the phase timewise (on the same day, in following days...).

PHASE 6b

REALIGNMENT PHASE: to fill in, if it was necessary to activate it (otherwise, phase 6b is to be cancelled from the file).

Note

ANNEX 2

FORMAT OF THE LINES OF DEVELOPMENT

This part is very important because it allows indicating activities that can be carried out, initiatives that can be organized, paths that can be followed starting from the knowledge and skills spurred by the CBSL lesson and to be developed in the following moments. All this allows planning further interventions that can cultivate social skills, citizenship competences or multidisciplinary connections that can be managed by us or by the course colleagues. This enables, on the one hand, to widen the students’ horizons, and on the other hand to spur them to cognitive transfer.

Let’s make a couple of examples:

- if the CBSL lesson was on butterflies, I can think of rearing caterpillars;
- if the CBSL lesson was on the protection of trees, I can think of producing recycled paper (and start a debate on recycle and reuse or on tree planting at school, in the town...);
- if the lesson produced a simple theatrical script, I can think of putting it on stage (perhaps even making artistic scenery!);
- if the lesson produced slogans or Social Advertising, I can think of launching the advertising and disseminate it at school or on the territory;
- if I produced tales/fairytales, I can think of collecting them in a book or through digital storytelling;
- if I used comic books in my lesson to transmit contents, I can organize a laboratory on comic books (art and technology);
- if I worked on the 2030 Agenda goals, I can think of a line of development that leads the students to develop awareness campaigns to be disseminated inside and outside the school...

Note

ANNEX 3

Scoring criteria for the Test:

Total points that can be given:

Scoring criteria for the Mark:

No. of students	Mark given	Value of the percentage with respect to the entire class

RESULTS OF THE TEST

Note



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