

Social Emotional Learning (SEL) and earthquake: the teaching of emotions meets Geoscience



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Short note

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ABSTRACT

In the occasion of the tenth anniversary of the 2019 L'Aquila earthquake, the Istituto Nazionale di Geofisica e Vulcanologia of Lerici (SP), together with the Fire brigade Command of La Spezia and the Seismic Sector-Office of the Tuscany Region, designed a *transformational learning* path for the 2019 INGV-*ScienzAperta* involving about 300 students of Middle Schools (ISCED 2) of Liguria in their classrooms. Images, videos and readings of earthquake testimonies told by rescuers, seismologists and geologists were shown to students, underling the great humanity of people who worked during the emergency. The *Social Emotional Learning (SEL)* experiment revealed an enriching experience for both recipients and trainers, as it was well put in evidence by the touching students' essays after the *ScienzAperta* meetings and by the satisfaction questionnaires differentiated for students and teachers. The results were also presented at the University of Camerino 2019 Summer School for Geosciences teachers.

KEY-WORDS: Social Emotional Learning, trasformational learning, Earthquake, awareness, Resilience, Education.

INTRODUCTION

The Italian territory is frequently affected by earthquakes. It's important not to lose memory of past disasters, and to avoid that citizens and local institutions make wrong choices enhancing social vulnerability and risk. Building natural hazard awareness to cope natural disasters has always been the ambitious goal of natural risk education projects conducted by the INGV in collaboration with local authorities, fire brigades, the Civil Protection Department and the State Forestry Corps (Piangiamore et al., 2012, 2013, 2021).

Each initiative has never been simply a dissemination and scientific communication event, but it triggers processes of *active learning* to foster good practices for natural risk reduction (Piangiamore et al., 2016, 2019). The 2009 L'Aquila earthquake, devastating the city and causing the death of 309 people, is emblematic and still imprinted in memory. The ten-year anniversary of this disaster was a significant opportunity to deepen the knowledge of the event and, at the same time, to raise awareness of the community about seismic risk. The *SEL* was the protagonist of the 2019 edition of *ScienzAperta* organised in La Spezia by the INGV of Lerici and titled "*Red Zone: 10 years after the L'Aquila earthquake*". *ScienzAperta* is an INGV initiative, launched in 2011, with the aim to spread Science to schools and the general public, with events, conferences, workshops and museum paths in the whole national territory, to train more responsible citizens. The 2019 initiative was enthusiastically welcomed by the firefighters and their commander, collaborating with INGV in the *ERiNat (Natural Risk Education)* training project from 2004 to 2015, and by the geologist of the Seismic Sector of Tuscany Region. With the latter, since 2013 a collaboration has been carried out during several events like many editions of the "Angels of San Giuliano" literary Prize for fairy tales, Festival of Civil Protection in Tuscany and Liguria, Feast of geology in Equi Terme (MC), and the *Bimbi per bimbi* project. The organization of the L'Aquila 10 - years event has meant reliving the strong emotions felt in the post-earthquake emergency communication in the first aid tent cities of Arischia (AQ) immediately after the 2019 earthquake. The *long-life learning* purposes started from "Earthquake and Society told at school" storytelling, focusing on the emotions

aroused by the 2009 catastrophic earthquake, to favor the process “remembering to tell, telling to be”, by means of the experiences of people who worked in that emergency. The activity involved more than 300 students of the third classes of the IC “Ex Giustiniani” of Rapallo (GE), “U. Formentini” of ISA 7 and “U. Mazzini - S. Pellico” of ISA 4 of La Spezia Middle schools.

MATERIALS AND METHODS

Encouraging the teaching of socio-emotional skills, we favor effective learning and a person’s global development. Gardner’s theory of “multiple intelligences” extends the concept of human intelligence, examining the interpersonal and intrapersonal aspects, which are deeply linked to the social and affective dimension of every human being’s life. Salovey & Mayer (1990) introduced the concept of “emotional intelligence”, spread only a few years later by Goleman (1995), and described as feelings management, self-motivation, ability to understand one’s emotions, to recognize emotions in others and to structure positive relationships. This new concept of intelligence, in contrast with the previous definitions where rationality and feelings must remain separate, is also confirmed by neuropsychological studies, affirming that emotions operate in connection with each other, building up the whole person (Kunnanatt, 2004). *Social and emotional education* refers to the process by which both young and adults develop fundamental skills in fostering positive integration into their own social context. SEL skills include social awareness, self-awareness, self-management, interpersonal skills, decision making and responsibility. Therefore, we aim to achieve prosocial goals, activating effective communication. To raise the ability to recognize, monitor and regulate students’ emotions is important. If the future citizens identify and cultivate their potential, also understanding others’ thoughts and feelings, they’ll establish healthy relationships based on cooperation. They can also make responsible decisions and evaluate ethical solutions to difficulties to promote one’s own and the others welfare (Piangiamore et al., 2013, 2015). The SEL activities of the special edition of *ScienzAperta* addressed to the third classes of the Middle School, described in the following paragraphs of this paper, deal with the different experiences by INGV researchers, firefighters and geologists soon after the disaster to help population involved in the seismic sequence.

Face to face with the Earthquake

During the 2009 post event emergency, the COES (Centro Operativo Emergenza Sismica, Seismological Emergency Operational Center) within the DICOMAC (Directorate of Command and Control, the central structure of the DPC coordinating the emergency activities in the areas affected by the earthquake) in Coppito (AQ), provided constant information to the affected population on the ongoing seismic sequence. Soon after the L’Aquila earthquake of April 6, 2009, the INGV, in collaboration with the Department of Civil Protection (DPC) and the operators involved in the emergency, set up a series of initiatives to support the population hit by the earthquake, with particular attention for teachers. The main aim

was to enhance seismic risk perception, providing elements of knowledge to develop awareness of the risks of their own territory and, at the same time, to encourage the assumption of safe behavior. These activities arose from different experiences and skills gained in recent years in seismic risk reduction projects. Therefore, to cope with the new emotional and cognitive needs of teachers and students that experienced the disaster, the educational paths of the *EDURISK* project (www.edurisk.it) was adapted to develop new specific educational programs for the post-earthquake phase in the first aid tent cities. In particular, the *EmerFOR* project was addressed to teachers (April-June 2009) to prepare them to cope with earthquake emergence issues with students; on the other hand, the *La Terra tetteca... Ji No!* project was addressed to the L’Aquila inhabitants (April-August 2009) to support them during the emergency, integrating the training activities initiated by *EDURISK* in Abruzzo. This experience showed the importance of efficient communication by specialists during the emergency: they can provide prompt answers to scientific topics that otherwise could be misunderstood. During the post-earthquake period, the researchers’ presence was extremely effective to spread the basic knowledge on seismology and on Italian seismicity and the detailed scientific information on the seismic sequence evolution. Psychologists played a relevant role in transmitting know-how on the emotional response to catastrophic natural events and, when necessary, in supporting people struck by the earthquake (Camassi et al., 2009; Crescimbeni et al., 2010; Nostro et al., 2010). The 2019 *ScienzAperta* activities for Ligurian schools started with the photos of the L’Aquila “red zone”, that is the most damaged area. Showing the images to students, reactivated the researcher’s same strong emotions felt ten years before during the emergency. At the same time, it arouse great interest in the involved classes, also triggering intense feelings in them. The photos were the tool to catch the attention of students, preparing them for the very impressive documentary video-stimulus “*L’Aquila earthquake 10 years later: the provisional is forever. Symbolic places (and delays) of a city that does not give up*” (<https://www.ilfattoquotidiano.it/2019/04/02/terremoto-laquila-10-anni-dopo-il-provisorio-e-per-sempre-luoghi-simbolo-e-ritardi-di-una-citta-che-non-si-arrende-videoracconto/5074323/>). During the activity, INGV researchers and students reflected together in a constructive debate on the meaning of rebuilding a city after having dramatically lost the whole social fabric, also planning spaces to make possible the rebirth in a sustainable way in the economic context. All this always keeping in mind that the area has a high seismicity and events like the 2009 earthquake can strike again (Fig. 1). Unfortunately, up today we are still far from having reconstructed the minimum sociality needed for a revival of the L’Aquila city community. After the debate the researcher invited students to watch on their own the video “*Non chiamarmi terremoto*” (“*Don’t call me Earthquake*”; Gabanelli et al., 2010; <https://www.youtube.com/watch?v=Ny12bhH3zDw>) realised within the *EDURISK* project. The protagonist of the story is their peer Marta, a 12 years old girl who lives in L’Aquila. Everyone in town knows her by the nickname “Earthquake”, but after the terrible night of April 6th none can call her so anymore. The earthquake has transformed Marta not only in the name. A year later, her class participated in the “*Tutti giù per terra*” (“*All fall down*”) active learning path, on the occasion of the first anniversary of the terrible earthquake (Brasini et al.,



Fig. 1 - On the left: Program of the ScienzAperta 2019 dedicated to SEL at Middle Schools; on the right Face to face with the Earthquake (by INGV – Lericci).

2006). In the meanwhile, Marta is becoming a more and more aware young woman. She didn't resign herself to fatalism and fear, but she learnt that seismic risk is a characteristic of her territory, where the earthquake will return sooner or later. The Marta's message is that we can defend and prepare ourselves mainly by building safer houses and by adopting proper behavior.

SismaFotoSensi (EarthquakePhotoSenses) - A Fireman's free thoughts on a journey guided by sensory experiences

The *SismaFotoSensi (EarthquakePhotoSenses)* activity was the second session of the 2019 ScienzAperta SEL experience for students, and it was conducted by firefighters. The *SismaFotoSensi* is a *sensory experience*, starting from the author's reading of selected pages from his book "*Sarnano, in provincia di Macerata... liberi pensieri di pompieri*" ("*Sarnano in the province of Macerata... free thoughts of a firemen*"; Trolese, 2017). It is a guided journey through the hidden thoughts of a fireman during the emergency phases. For firefighters it's not always easy to open their heart and let their own emotions flow. They usually internalize and metabolize their professional expertise. Year after year, rescue after rescue, they become more and more intimate and find themselves struggling with their ghosts, almost as if opening up, sharing, confronting would be a defeat. During the ScienzAperta meeting, the author of the book opened his soul, letting out emotions, and sincerely shared with students his intense work practice. Reading his own book in class and some pages from "*Angeli tra le macerie*" ("*Angels in the rubble*"; Federici, 2009), was for him an opportunity to live "an experience into the experience". The feeling arose in the listening students, making them living the same emotionally significant rescuer's storytelling. A great empathy was created between the author and the students: the surprise was in their eyes, they were strongly interested, and they asked questions about the social aspects of the earthquake. They also better understood how it's important to provide specific tools in "peacetime" as a primary strategy of defense against risk. After this meeting, students

wrote compositions on their SEL experience, describing it as very interesting and impressive. They were interested in knowing the dynamics of destructive natural events and much more in how to prevent disaster that struck and upset Society. (Fig. 2).

Fairytales in the tent camps

The last ScienzAperta 2019 meeting devoted to SEL experiences was focused on the *Bimbi per bimbi (Children for children)* project. It was an aid initiative born in the aftermath of the 2009 L'Aquila earthquake as a small voluntary contribution addressed to children hit by the earthquake. The main aim was to give an hour of quietness and fun in the tent camps, telling stories to children and them the books donated by other children from the Tuscany Region. The tent camp fairytale storytelling dampened the tension, giving a little distraction and ripping a smile with its talking puppets to the children. To instill the culture of solidarity, the children living far from the earthquake area reflected on the meaning of living in seismic regions thus being conscious about the importance of adopting safe behavior and making right choices. At the same time, the children of L'Aquila felt surrounded by affection, thinking that there was someone taking care of them, increasing the hope to return to normal life as soon as possible (Fig. 3). All children involved in the initiative became aware of human resilience to face together a terrible experience in which entire communities have lost everything and are in urgent need of help to survive and cope with the disaster. During the whole 2009, 685 books, both new and second hand in good conditions, were collected and given to children living in the first aid tent cities. During June 2009, 7 animation and fairytales shows were realised in the tent camps of the neighborhood of L'Aquila, specifically in the villages of Fontecchio, Fagnano Alto, Succiano (Acciano), and Castelnuovo (S.Pio delle Camere) and at the primary schools of Secinaro, Castelvecchio Subequo, Fontecchio.

A similar initiative was replicated on the occasion of the August 2016 earthquake in Central Italy with the same intent. In this case, a *Fairytale Festival* was organised not only for children, but also involving the whole population. This solidarity project, grown on a



Fig. 2 - EarthquakePhotoSenses (by La Spezia Fire Brigade).



Fig. 3 - Fairytales in the tent camps: activities in the 2009 and 2016 earthquake sites (by Settore Sismica – Toscana).

voluntary basis, also consisted in a twinning between 39 classes of Primary and Middle Schools (ISCED 2) of Viareggio (LU) in Tuscany and the Primary and Childhood School of Acquasanta Terme (AP), hit by the 2016 seismic sequence. On the occasion of Christmas, the children from Tuscany gave more than 500 books and DVDs, coupled with drawings and letters to their peer in Acquasanta. Moreover, 6 bookshelves were added as Christmas gifts for children at tent camps (<https://fiabeefrane.com/2016/09/24/bimbi-per-bimbi/>). At the end of the special venue, students showed great interest and learnt how important it is to share emotions and belongings, cooperating even at a distance in such extreme circumstances.

RESULTS

The storytelling meetings at school by experts promoted the growth in resilience and it appears to be a clear message of never losing hope, underlining the importance to be active citizens in collective choices. The cognitive contents of the *learning paths* were storytelling through images, videos, testimony readings to give voice to those who experienced the destruction and the first aid tent cities. The know-how vibrates with emotions, transmitting to both students and teachers what the rescuers, seismologists, geologists and emergency communicators feel when a natural disaster occurs. The emotions become learning during the whole special venue for the more than 300 third grade students participating. The common feeling of all experts involved in *ScienzAperta 2019* of La Spezia was useful to bring some comfort to the population after the disaster. Then the “*Non chiamarmi terremoto*” docu-fiction on seismic risk reduction was seen by students at home or in the classroom with teachers in the next days after *ScienzAperta* event, enforcing the message that reducing earthquake damage is possible by correct actions supported by scientific information. Different people, but similar emotions, moods, feelings, and identity perceptions joined by the common will to support and help those who have suffered the disaster: a training course not only formative for the recipients, but also for the trainers themselves. The message was well received by

the students who wrote beautiful essays, collected by their teachers after the *ScienzAperta 2019* event. At the end of the whole activity, satisfaction surveys differentiated for students and teachers were performed to measure their fulfillment and to collect feedback, testing the efficacy of our *SEL* activities. The answers received gathered suggestions for future experience. The graphs in Fig. 4 display the cumulative percentage value of answers of teachers and students concerning the most significant questions, related to the usefulness of the initiative. The outcome confirmed the high appreciation and interest of both students and teachers, already shown in the numerous comments during the special event and by the students’ essays. The results of the *SEL* activity was presented to teachers of all school orders at the 2019 Summer School training course on new methods of teaching Geosciences organised by University of Camerino. In this contest, our *SEL* experience was described to teachers as a “service activity”, designed to meet a specific civil protection requirement: devising ways and means by which multidisciplinary scientific knowledge can be made available to the general community through the school.

DISCUSSION AND CONCLUSIONS

School is generally focused on the cognitive aspect of learning, mainly paying attention to the content to be learned, leaving aside how they should be absorbed. Yet, the emotional aspect of the study shows that motivated and interested students achieve better results than those who are not emotionally involved. Learning educational content should be combined with loyalty, respect for others and ability to recognize/evaluate their emotional states and those of adults, in order to better manage their behavior and interpersonal relationships. *SEL* is a format that implies the “how” of teaching. The *SEL* activities we developed focused on the consequences of the 2009 L’Aquila earthquake on society ten years later, relieving the emotions aroused by the catastrophic event.

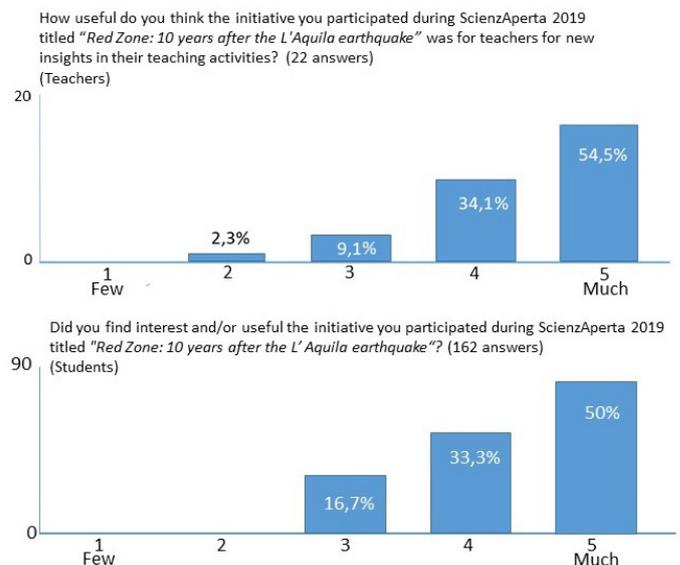


Fig. 4 - Cumulative values showing percentage of the feedback received from teachers and students through the satisfaction questionnaires.

The special venue of *ScienzAperta* 2019 of La Spezia took place in the classrooms and was divided into a series of short initiatives and activities, closely related to each other. Various actors (INGV researchers and emergency communicators, firefighters, geologists, local authorities, volunteers and schools) were involved to re-elaborate memories related to the earthquake, promoting actions of civil protection and active citizenship. We let the ancient feelings experienced during the 2009 shock rise again with the aim to face fear and not be caught unprepared when the earthquake will hit once more. The main aim is to facilitate students' learning and teachers' work, expanding participation and ability to act and react as a community in case of disaster. *SEL* promotes the overall individual development favoring knowledge of cooperation and respect for others, to better manage the correct behavior in case of natural hazard. The creative narrative process conveys the heritage of the recovery memories to the school community, to favor the resilience of the populations. The meetings with the experts at school were an important reflection moment of *transformational learning* (Piangiamore & Maramai, 2022). This learning path represents a collective work on the recovery of the earthquake memory to stimulate awareness-raising and active mobilization of risk-reduction-oriented choices in future citizens. Moreover, knowledge, understanding and opinions are not mostly built at school and the above described *SEL* initiative let School approaches to Research, favoring the trust in scientists (Musacchio et al., 2016; Musacchio & Piangiamore, 2016).

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