

Earthquake Fragments: teenagers' imaginations as a starting point for seismic risk education

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Abstract

From 2021 to 2023, the “A Scuola di Terremoto” (At the School of Earthquake) project, promoted by the Civil Protection Department of Calabria Region in collaboration with the Istituto Nazionale di Geofisica e Vulcanologia (INGV, National Institute of Geophysics and Volcanology), worked with schools throughout Calabria (southern Italy) to foster a culture of risk reduction, with particular emphasis on seismic risk. Through workshop activities and training programmes for students and teachers, the project explored teenagers' mental representations of earthquakes. Over the course of two school years, 246 stories were collected – narrated by students through drawings and written accounts – from which isolated protagonists emerged, who rarely turn to the community or institutions for support. To develop the capacity to understand and confront risk, to recognise and manage the emotions it evokes, and to facilitate effective responses to emergency situations, the project advocates a constructivist educational approach aimed at strengthening territorial awareness, coping skills, and collective resilience. The proposed activities seek to transform emergencies from overwhelming experiences into manageable challenges, fostering more realistic and positive internal dialogues. “A Scuola di Terremoto” project represents an innovative model of civic education and prevention, which recognises the critical role of mental representations in building communities that are better prepared and more cohesive in the face of risk.

Keywords: Seismic risk, Emergency education, Mental representations, Collective resilience, Coping.

1. Introduction

Disasters resulting from natural hazards represent one of the most significant threats to human life and community well-being worldwide. In recent decades, the increasing frequency and intensity of disaster events has heightened the urgency of investing in Disaster Risk Reduction (DRR) education, particularly among younger generations (Midtbust et al., 2018; Masocha et al., 2025). Schools have been widely recognised as a privileged arena for building disaster resilience, given their capacity to reach large numbers of young people and to act as agents for broader community awareness (Yildiz et al., 2023; Masocha et al., 2025). The international community has long acknowledged education as a cornerstone of disaster risk reduction: the Sendai Framework for Disaster Risk Reduction 2015-2030 explicitly recognizes children and youth as 'drivers' of change (UN/ISDR, 2007). Despite growing international consensus on the importance of DRR education, most educational programmes remain anchored to the transmission of factual information about hazards, without engaging students in higher-order dimensions involving action, participation, and community engagement (Ronan et al., 2015; Midtbust et al., 2018; Masocha et al., 2025). This divide between knowledge-based approaches and participatory, child-centred DRR has been critically examined by Amri et al. (2017), who argue for stronger integration between classroom learning and community-level engagement in order to foster meaningful resilience. In line with this perspective, a systematic review on adolescent disaster resilience further emphasises that effective education must go beyond knowledge acquisition to encompass recovery skills, participatory methods, and coping capacities, with social networks (including teachers, peers, and family) playing a crucial role in enhancing students' resilience (Karimi Kivi et al., 2025). The necessity of this shift is further highlighted by the fact that awareness of hazards does not necessarily translate into appropriate protective behaviours or a meaningful understanding of collective emergency response (Midtbust et al., 2018; Yildiz et al., 2023). Ultimately, because children's risk perception is uniquely shaped by their family context and differs significantly from that of adults, effective risk communication must account for these complex group dynamics (Ryan et al., 2012).

This paper contributes to the existing literature by presenting a place-based experience of seismic risk education developed in one of Italy's most hazard-prone regions. Calabria is one of the most seismically active regions in Italy, where risk awareness has not yet translated into a widespread culture of preparedness. Figure 1 (left) shows the spatial distribution of the strongest earthquakes (with magnitude greater than 5) that occurred in the Calabria region during the period 1000-2000 (Rovida et al., 2022).

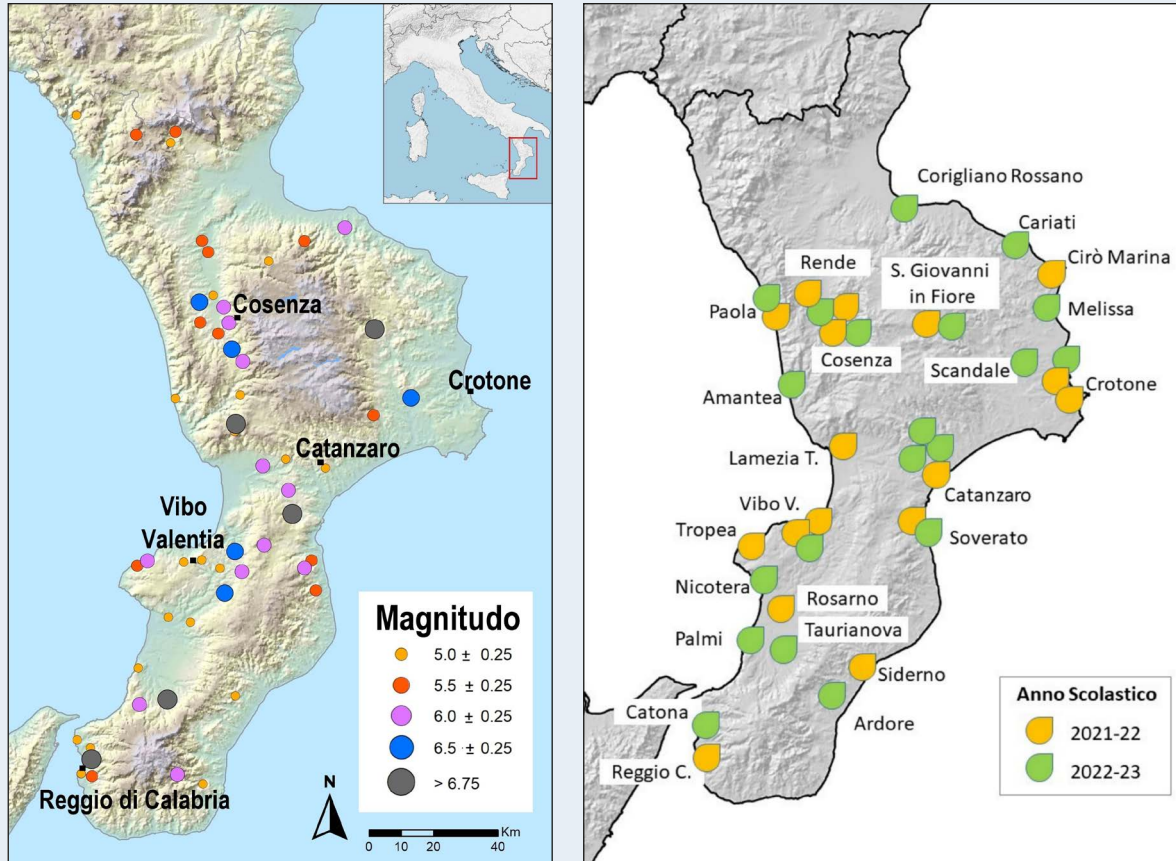


Figure 1. (Left) Spatial distribution of historical earthquakes in Calabria region, Southern Italy, classified by magnitude. (Right) Geographic distribution of participating schools across Calabria region during the 2021-2022 (yellow) and 2022-2023 (green) academic years.

Since 2021, Edurisk, a research and science communication group at the Istituto Nazionale di Geofisica e Vulcanologia, has been working across all provinces of Calabria region with primary and lower secondary schools on risk education, with particular focus on seismic risk. The group's expertise spans physics, geology, engineering, psychology, and educational sciences. For more than 20 years, the group has been delivering educational programmes in Italian schools (www.edurisk.it, accessed 23 June 2026), with the aim of building a culture of prevention that is both shared and accessible.

The group applies a constructivist educational approach (Bruner, 1996), viewing learning as an active process of meaning-making. From this perspective, students

are agents who interpret, elaborate, and integrate new knowledge in light of their own experiences and representations. We also recognise the importance of social and cultural context in learning, and promote comparison, negotiation, and sharing as fundamental tools for meaningful and lasting knowledge.

The “Terremoto Immaginario” (Imaginary Earthquake) workshop, which is at the heart of this article, was designed with the aim of exploring what students imagine about earthquakes, drawing on their existing knowledge and mental representations and engaging them actively with the topic.

It forms part of a broader programme structured in three stages: the first dedicated to risk in general, the second to the earthquake as students imagine it, and the third to the testimonies of people who have directly experienced a seismic event. This gradual approach enables the construction of a bridge between the imaginary and reality, fostering a deeper and more realistic understanding of the phenomenon.

The entire programme responds to the requirements for Civic Education in school curricula, promoting cross-cutting competences such as risk awareness, individual and collective responsibility, the ability to act in critical situations, and solidarity. In this sense, “A Scuola di Terremoto” is not merely a science communication project, but an opportunity to educate more active, prepared, and community-minded citizens. This article takes its title, “Earthquake Fragments”, not from the name of the workshop, but from the words of a student who, describing the earthquake scene in his story, wrote: “The house was wrecked, the gardens full of broken things. Everything was made of earthquake fragments.” This phrase struck us for its ability to capture, in a poetic and evocative way, both the material fragmentation caused by the earthquake and the fragmentary nature of the imagined scenario that students construct around this event. We chose to adopt it as our title in tribute to him and to all the students and teachers who have participated in and contributed to the growth of the project over these years.

Being able to accurately and concretely imagine an emergency situation enables people to prepare to respond appropriately. When individuals can contextualise an event within their mental landscape – constructing representations that include the role of the community, institutions, and territory – they are better able to orient their actions and make sense of what is happening. A rich and realistic collective imagination not only facilitates risk comprehension but also provides shared reference points that support organised and effective responses.

In this sense, risk education is not simply about transmitting technical information, but about building scenarios, narratives, and images capable of making an emergency conceivable, and therefore manageable. Broadening the imaginary scenario means offering students symbolic and cognitive tools to recognise risk, interpret it, and position themselves actively within a collective response. Cognitive and emotional

appraisals of events and their associated mental representations enable people to become active agents, capable of drawing on psychological and social resources in stressful situations (Mariantoni and Vaccarelli, 2018).

This perspective is also grounded in psychological research on risk. Loewenstein et al. (2001) demonstrated that emotional reactions to risk – such as fear, anxiety, and apprehension – are not simply consequences of cognitive appraisal, but operate in parallel and often independently of it, significantly shaping actual behaviours. Similarly, Slovic et al. (2004) distinguish between an “analytic” system, which processes risk through probabilistic calculation and logical reasoning, and an “experiential” system, more intuitive and effective in nature, which constitutes the most natural and immediate way in which people assess dangerous situations. Both contributions suggest that an emotionally rich imagination, rooted in concrete experience, is a necessary condition for activating appropriate responses in the face of danger. These insights align with a growing literature showing that children and teenagers can act as active protagonists in community risk reduction – provided that educational programmes go beyond information transmission to incorporate experiential and community-based components (Ronan et al., 2015; Midtbust et al., 2018; Nakano and Yamori, 2021).

Since realistic representations help people make sense of events, process their experiences, and reduce stress, we believe that working on such representations is crucial to preparing students and adults to respond more effectively to natural challenges, strengthening individual, group, and community resources.

Understanding the representations that students hold of emergencies helps us design effective educational interventions and develop shared experiences of knowledge and awareness, in which students can recognise themselves as active and responsible agents, ready to face the challenges of risk with greater awareness and competence.

By analyzing 246 illustrated stories produced by lower secondary school students in Calabria region, this paper shows how the students’ mental representations of earthquakes reveal gaps and limitations in their imagined earthquake scenarios. The paper is structured as follows: Section 2 provides a brief overview of the “A Scuola di Terremoto” project; Section 3 describes the “Imaginary Earthquake” workshop, one of the three workshops offered to students as part of the project, and the methodology adopted; Section 4 presents the descriptive data; Section 5 discusses the main findings organised around five thematic dimensions; Section 6 draws conclusions and educational implications.

2. The “A Scuola di Terremoto” Project

“A Scuola di Terremoto” is a project directed at lower secondary schools (students aged 11-14) throughout Calabria, promoted by the Civil Protection Department of the Calabria Region in collaboration with INGV, and carried out between 2021 and 2025. It includes training interventions for teachers and participatory workshop activities for students, built around storytelling and cooperative learning techniques, with the aim of stimulating knowledge, critical engagement, and active citizenship around the topic of seismic risk. The project is still ongoing under a new name, “A Scuola di Protezione Civile” (Learning About Civil Protection). Educational interventions draw on the resources of the EDURISK project (Sidoti et al., 2007) and are grounded in the specific needs and characteristics of the local community.

3. Methodology

What happens when school students are asked to narrate and imagine an earthquake through stories and drawings?

One of the proposed workshops, entitled “Terremoto Immaginario”, consists of inventing an illustrated story structured in four consecutive scenes. It was designed within a broader constructivist educational framework (Bruner, 1996) and informed by the principles of Disaster Risk Reduction Education (DRRE), with the aim of exploring students’ mental representations of earthquakes, drawing on their existing knowledge and imaginative scenarios. The use of stories created through both words and drawings to explore teenagers’ risk perceptions has proven an effective method, eliciting spontaneous and reliable responses that reveal their actual mental representations (Carone and Marincioni, 2020; Todesco et al., 2022).

3.1. Participants and setting

The study involved approximately 500 lower secondary school students across 34 schools in all provinces of Calabria region (Figure 1, right image), over two school years (2021-2023). Schools participated on a voluntary basis, following an invitation disseminated through the Regional School Office and through word of mouth among teachers already familiar with the work of the Edurisk group. Students worked in pairs, and a total of 246 illustrated stories were collected and analysed. The age range of 11-14 was chosen as it corresponds to lower secondary education in Italy and represents a developmental stage at which students are capable of engaging

in abstract thinking and narrative construction (Inhelder and Piaget, 1958). The great majority of participating students had no direct experience of a significant seismic event, although given Calabria's ongoing low-level seismic activity, minor tremors cannot be entirely excluded for all participants. This is a relevant contextual factor, as previous research has shown that direct hazard experience can influence children's risk perceptions and their mental representations of emergencies (Yildiz et al., 2023). The absence of direct experience in most participants means that the representations collected reflect predominantly imagined (rather than experientially grounded) scenarios, which is precisely what makes them valuable as a window into the cultural and educational frameworks through which young people construct their understanding of seismic risk.

3.2. Educational context and sequencing

It is important to note that the "Imaginary Earthquake" workshop was the second phase of a broader educational program divided into three phases. The first phase focused on risk in general, in relation to everyday experiences, and aimed to develop an understanding of its constitutive factors (hazard, exposure, and vulnerability) and to frame it as a complex issue involving emotions, behaviours, and responsibilities. The second phase focused on earthquakes imagined by the students, while the third phase focused on the testimonies of people who had directly experienced a seismic event, in order to compare students' imagined experiences with real ones.

This sequencing raises a methodological consideration: students' representations of earthquakes were explored after an initial phase of general risk education, which may have influenced their responses to some degree. However, the first stage was deliberately designed to address risk in broad terms, without specific focus on natural hazard, in order to minimise direct priming effects (Higgins et al., 1977) on students' earthquake-related imaginative scenarios. Moreover, the narrative and creative nature of the workshop (inviting students to invent a story freely, without predefined answers) was intended to elicit spontaneous representations rather than learned responses. The workshop therefore provides a window into students' imaginative frameworks as shaped by their prior knowledge, cultural context, and educational background, rather than a measure of knowledge acquisition from the programme itself.

3.3. The activity

The activity invites students to work in pairs. Each sheet is divided into two parts: a square space for drawing and a lower strip for the written text, which together represents one scene of the story. Students are asked to develop the narrative one frame at a time, without knowing in advance how subsequent scenes will unfold (Figure 2).

In the first scene, students introduce the protagonist(s) and set the story in a familiar context similar to their own environment, providing information about the surrounding territory.

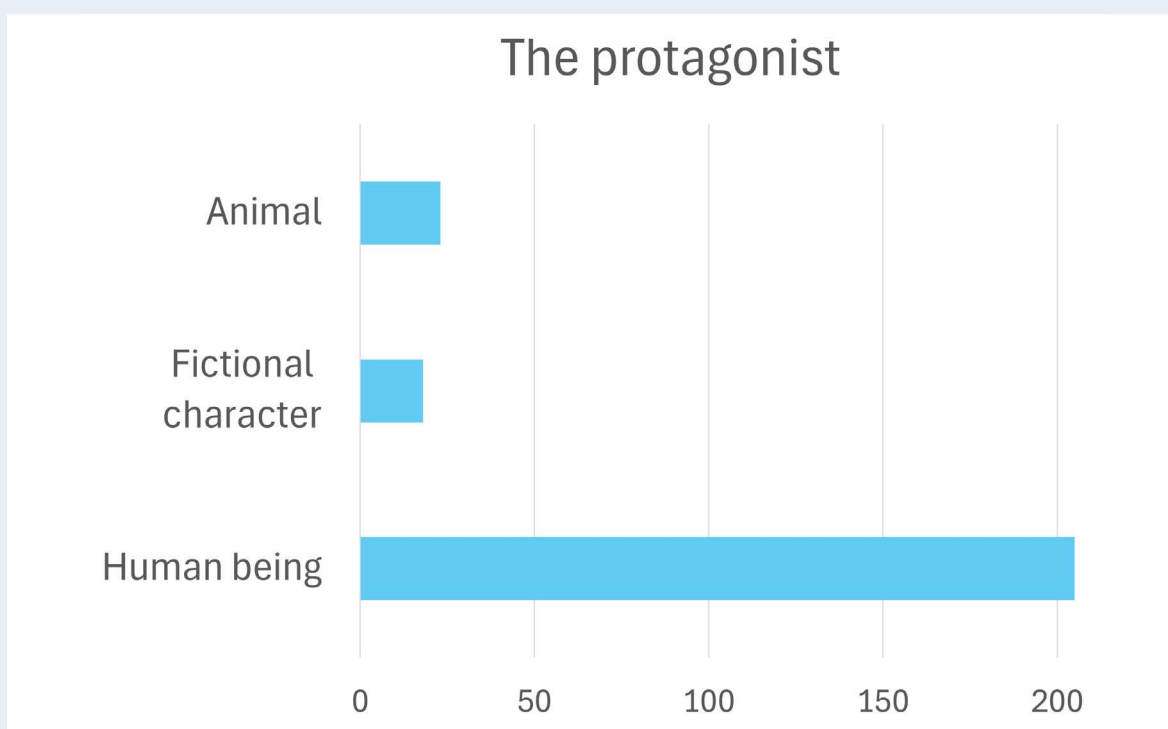


Figure 2. Example of a story created by two students of the I.C. "O. Lazzarino" school, in the province of Reggio Calabria.
a) text of scene 1: We drew a place in Calabria region, the church of Sambatello. The church has two entrances, a bell tower, many windows and a statue of the Madonna. Mari and I (the protagonists) are sitting on a bench.
b) text of scene 2: The church of Sambatello has now been destroyed by a very powerful earthquake. Mari and I have fallen to the ground. I am screaming "Help!" and Mari has fallen over.
c) text of scene 3: The church is being rebuilt. We are in hospital, but we are fine – just a few injuries, nothing serious.
d) text of scene 4: The church was restored about 9 months ago. Mari and I have recovered. "Let's hope it never happens again" – and people should be careful, if they can.

In the second scene, the earthquake strikes unexpectedly. Students represent the event and its effects, imagining the reactions of the protagonists, the emotions experienced, and the actions taken by others.

The third scene focuses on the immediate aftermath of the event: the earthquake is over, and students must demonstrate the location of the protagonists, their current state, and their subsequent actions.

In the fourth scene, life returns to a form of normality. Students describe the context at a point in time after the event: what has changed? Where are the protagonists, and what transformations have occurred compared to the beginning of the story?

3.4. Aims

The primary objective of this activity is to explore students' imagined scenarios of earthquakes, using creativity as a research tool. This approach makes it possible either to stimulate open discussion or to investigate in depth the themes that emerge spontaneously from their representations. Through this activity it was possible to understand how students interpret earthquakes, what behavioural models they associate with the event and with the emergency, and how they imagine the phases that follow, by listening to their perceptions and experiences. This narrative approach draws inspiration from methodologies already used successfully in other natural risk contexts, where the identification of misconceptions through creative activities has enabled the development of targeted educational interventions (Todesco et al., 2022).

3.5. Method of analysis

To analyse the collected stories, we developed an analytical grid to organise the various elements that emerged: (1) *Setting*: variable locations, including cities, villages, mountains, coastlines, and countryside; (2) *Characters*: children, adults, elderly people, fictional characters, animals, male and female; (3) *Emotions*: fear, panic, astonishment, sadness, worry, and hope; (4) *Reactions*: mutual assistance, seeking shelter, attempts at reconstruction, fleeing, or protecting personal belongings; (5) *Environmental changes*: destruction such as collapsed buildings, damaged fields, fallen trees, and fires, with an examination of whether the context returns to normality or shows significant evolution; (6) *Time and reconstruction*: analysis of the timescales of the emergency and reconstruction phases (hours, days, months, or years); (7) *Interventions and actors*: figures involved, including protagonists, family members, friends, the wider community, institutions, journalists, and emergency

services; (8) *Actions taken*: seeking shelter, crying, rebuilding, helping others, seeking resources, and others; (9) *Outcomes*: results of the actions taken, including rescues, the physical condition of those involved, and tallies of injuries and fatalities.

This grid enabled us to systematise the data, providing an overview of the reactions, conditions, and actions of the characters across the various stories. The students' narratives highlight the diversity of emotional and behavioural responses, offering an illuminating cross-section of their perceptions and mental representations. Observing these stories revealed not only their thoughts about earthquakes, but also the importance of starting from their mental representations in order to develop more meaningful and engaging educational interventions.

4. Data description

Over the course of two years, 246 stories were collected and analysed. Approximately 500 students participated, across a total of 34 schools involved in all provinces of the region (Figure 1, right image).

Analysis of the stories shows that in 83% of cases the protagonists are human beings ($n = 205$), half of them children/young people ($n = 102$) and half adults/elderly people ($n = 103$). In only 18 cases is the main role assigned to a fictional character, while in 23 stories an animal occupies the central role. In 30% of cases ($n = 74$), the stories feature more than one protagonist (Figure 3).

In the second scene, the earthquake is described primarily through the collapse of walls or buildings ($n = 72$), tremors ($n = 46$), and falling objects ($n = 37$). These elements frequently appear in combination within the same story, composing an image of the earthquake made up of multiple overlapping signals. Some stories set outdoors mention fallen trees or electricity poles ($n = 24$), while rumbling sounds appear rarely ($n = 12$), suggesting that the acoustic dimension of an earthquake is scarcely present in students' imaginations. In general, details concerning the phenomenon itself are limited. The focus is instead on the reactions of the protagonists: fleeing or running ($n = 77$), taking cover ($n = 63$), leaving the building or going outside ($n = 50$), and screaming or calling for help ($n = 35$) – a set of responses reflecting an instinctive orientation. In 23 stories, protagonists engage in helping others, while in 11 stories they warn other people. In only 2 accounts do protagonists take objects ("Luggage to leave" and "We went home to pick up only our T-shirts, pants, and shoes") with them, and in 15 they choose to go back inside. The predominant emotion is fear ($n = 101$), but panic or irrational behaviour also appears ($n = 31$), as does sadness or despair ($n = 32$) and worry ($n = 22$). In 10 stories students make explicit reference to trauma.

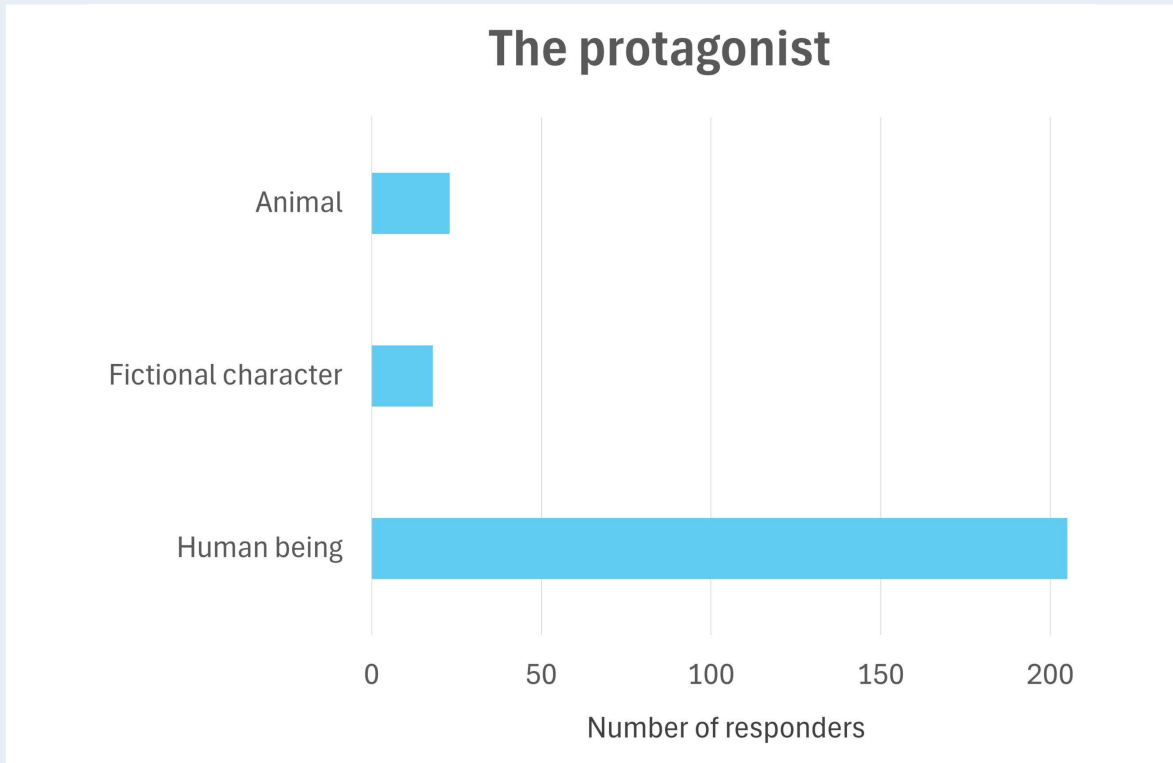


Figure 3. Type of protagonist in the story (n = 246).

The third scene, dedicated to the immediate aftermath of the earthquake, is set in the hours following the event in 93 stories, in the days that follow in 35, and in the subsequent months in 12. It is noteworthy that the temporal placement varies considerably and is often unspecified, suggesting that students have a poorly defined sense of the actual duration of a post-emergency phase. In this phase as well, the setting is marked by destroyed buildings (n = 103), devastated fields or fallen trees (n = 28), while a relative normality or an unchanged environment appears in 34 stories. Protagonists are often alone (n = 97) or with relatives/parents (n = 40). Only in some stories are firefighters, ambulances, or Civil Protection mentioned (n = 34), followed by the community in general (n = 19) and friends (n = 8). The main actions include returning home (n = 38), leaving the affected area (n = 34), and, in some cases, helping others (n = 30). It is worth noting that in 31 stories crying, screaming, or fleeing are still features – reactions typically belonging to the acute phase

of the event – confirming a degree of overlap between the “during” and the “after” in students’ representations.

In the fourth and final scene, dedicated to the post-emergency recovery, the setting is placed years later ($n = 73$), months later ($n = 69$), or in the immediate aftermath ($n = 58$). In this phase, 94 protagonists are living elsewhere, while 71 have returned home. In the majority of stories, the situation returns to normality ($n = 84$), with reconstruction ($n = 62$) or even improvements ($n = 56$); in 18 stories new earthquake-resistant buildings are described. However, in 27 stories the situation worsens or remains destroyed.

5. Analysis of results: the earthquake in students’ imaginations

The analysis of the 246 collected stories has made it possible to identify recurring elements that characterise students’ imagined scenarios of earthquakes. No data on gender distribution were systematically collected, as the workshop activity was conducted in pairs rather than tracked at the individual level. The principal critical nodes that emerged are discussed below, organised into five thematic dimensions that run transversally across the different scenes of the narratives.

5.1. The vague representation of places

In the students’ stories, an often-generic representation emerges – not only of the earthquake itself, which is understandable given that many of them have fortunately never experienced a major seismic event – but also of the environment and territory in which the events unfold. Although the instructions for the first scene requested that the story be set in a place similar to where the narrators live, and although students were given their materials so that the scenes could potentially be enriched and supplemented at a later time, the setting is frequently poorly detailed or merely sketched in. This finding may suggest a limited familiarity on the part of students with the territory in which they live, making it more difficult to recognise risks and respond effectively to emergencies. For this reason, it is essential to promote greater knowledge of the territory and of the appropriate behaviours to adopt in critical situations. It is important to anchor educational content to students’ everyday reality to their experiences, representations, and the concrete context of the territory and community in which they live. This approach makes the message more effective, preventing it from going unheard and increasing the likelihood that it will be

internalised and translated into meaningful action. This is consistent with findings from cross-cultural research on children's disaster risk perception, which has shown that the specificity and concreteness of the local hazard context plays a significant role in shaping the quality of students' risk awareness (Yildiz et al., 2023). Where territorial knowledge is weak, risk education remaining abstract and disconnected from the lived experience of students – precisely the condition least likely to foster genuine preparedness (Ronan et al., 2015).

5.2. Flee or help? Reactions to the earthquake

The main reactions described by students – fleeing, running, taking cover – reveal an instinctive and immediate response to hazard. However, the less represented actions, such as “taking things with you”, “warning others”, or “helping others”, reflect a focus on individual survival rather than on collective dynamics (Figure 4). This finding is consistent with what Loewenstein et al. (2001) identified in the concept of “risk as feelings”: immediate emotional responses to danger, such as the terror that drives one to flee, tend to prevail over more considered appraisals, especially when an elaborated image of the situation is absent. Slovic et al. (2004) add that risk perception is strongly shaped by affective experience and by the mental images associated with an event: in the absence of concrete and shared representations, the experiential system lacks the tools necessary to orient a collective and organised response. The predominance of individual over collective responses highlights a gap in students' understanding of the social dimension of emergency response – a dimension that research has shown to be critical for enhancing resilience through compatible communication with teachers, peers, and family members (Karimi Kivi et al., 2025). It is important to bear in mind that natural hazards have a significant community dimension: they affect entire populations, and it is those same communities that can mobilise to confront and overcome them. Risk education is most effective when it addresses not only individuals, but entire communities. To reduce risks, it is essential to stimulate and strengthen precisely this collective dimension. The tension between the need to survive individually and the desire to help others offers rich opportunities for reflection on empathy and morality during emergencies – and in particular on the development of emotional and social competences that enable individuals to act together in a conscious, supportive and effective manner.



Figure 4. Actions taken by the protagonists during the earthquake.

5.3. The lone protagonist: the absence of community in emergencies

In the stories, the protagonist emerges as the central figure in managing the emergency, acting almost always alone or accompanied only by family members (Figure 5). This finding highlights a limited understanding of the social and community dynamics that are necessary for effectively dealing with emergencies. It also reflects a broader pattern documented in the international literature on disaster education: children's mental representations of emergencies tend to be individually oriented, with institutions and organised community response largely absent from their imaginative scenarios (Midtbust et al., 2018). This individualisation of the

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emergency narrative is not merely a cognitive gap. It has direct implications for preparedness, since children who do not imagine a collective response are less likely to develop the attitudes and behaviours associated with community resilience (Ronan et al., 2015). Moreover, the limited presence of family members, peers, and institutional actors in students' stories suggests a disconnect between the individual focus of much disaster education and the reality that children's sense-making and preparedness are deeply embedded in family and community contexts (Ryan et al., 2012).

Helping students develop a richer and more realistic scenario is fundamental to fostering greater collective resilience and a sense of safety and wellbeing, since the awareness of not being alone strengthens the capacity to face situations of risk. Even if students have not directly experienced similar situations, educational

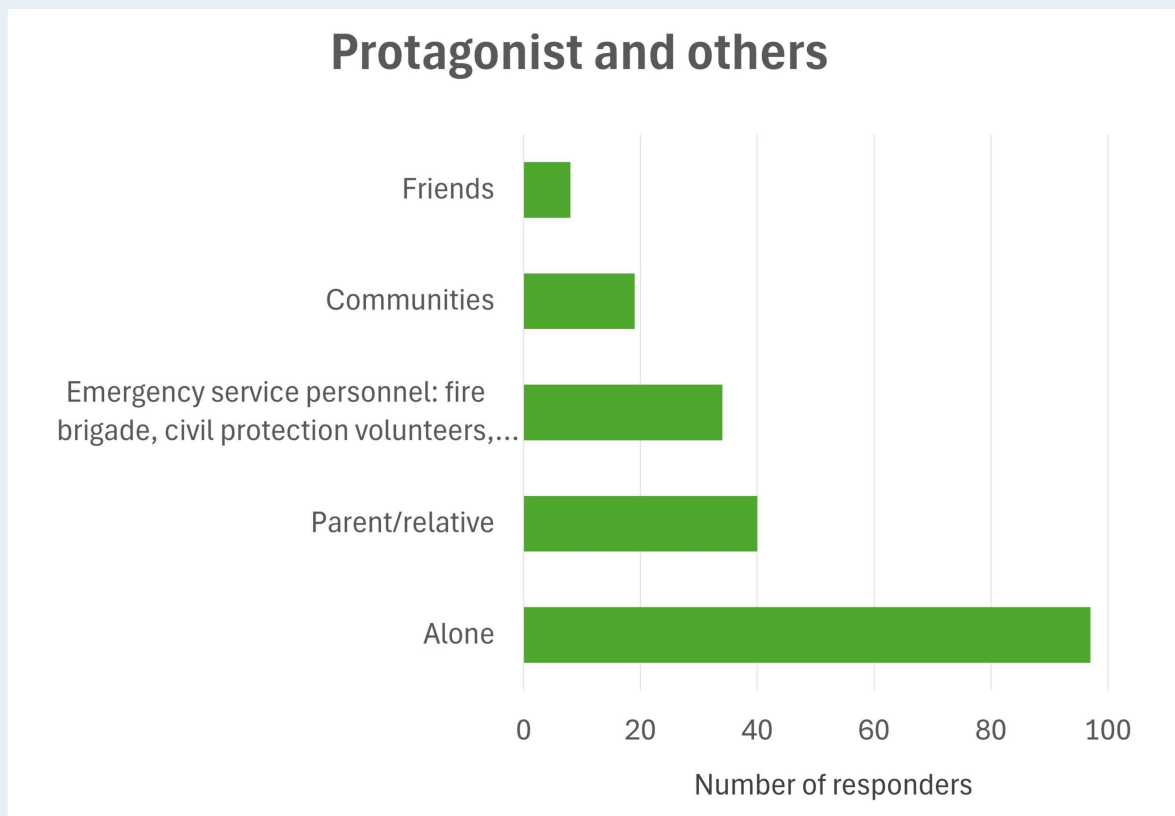


Figure 5. Actors involved during the emergency phase.

workshops can help them reflect on how communities have, in the past, been able to respond to critical events, and on how they might mobilise in analogous situations. According to Ercolani et al. (2022), a rich collective imagination can only be built through dialogue, participation, and the active sharing of knowledge within communities, especially where collective memory has been lost over time. This approach aligns with the recognition that schools serve as optimal venues for cultivating collective values and building a culture of safety, and that engaging children as active participants can convey a powerful message to the broader community (UN/ISDR, 2007).

Facing an earthquake requires multiple resources: appropriate behaviour, shared rules, solidarity, community organisation, education, planning, and safe building construction. Following the workshops, some classes began working on “Emergency Plans” for their territory, identifying “Waiting Areas” and concretely exploring what to do in case of need, thus activating reflections that continued to be useful well after our intervention.

5.4. Beyond information: becoming protagonists

The reactions of the protagonists are often limited to standard safety behaviours, devoid of dynamism. This may reflect the fear and anxiety associated with earthquakes, which tend to paralyse and hinder a more active response. For us, however, it is crucial to help students overcome this passivity, teaching them to make conscious choices and take effective action. This involves distinguishing between merely receiving information and actually “doing something” – acting, helping, taking concrete initiatives, and developing the awareness of being able to play an active role in managing emergency situations. In the international literature on disaster risk reduction education, Nakano and Yamori (2021) highlight how programmes limited to knowledge transmission (the “transmission paradigm”) rarely succeed in generating lasting proactive attitudes in learners. The authors instead propose a “proactive attitude paradigm”, grounded in active participation, engagement of the community of practice, and long-term evaluation. This distinction resonates with a substantial body of research showing that disaster preparedness programmes are most effective when they incorporate experiential, interactive, and community-based components that go beyond passive knowledge acquisition – encouraging children to discuss, plan, and practise responses in ways that build both confidence and collective agency (Ronan et al., 2015; Midtbust et al., 2018; Masocha et al., 2025). Building such competencies requires not only knowledge and preparedness skills, but also the development of recovery capacities and coping strategies that enable

students to navigate the emotional and practical challenges of post-disaster contexts (Karimi Kivi et al., 2025). Our educational programmes aim to stimulate genuine activation, engaging students through interactive methods that make them agents. This approach conveys – more through experience than through words – that educating about risk means working to enable people to be more active, rather than simply learning facts. To be truly effective, risk education must be based on relationships, meanings, and knowledge capable of becoming embedded in collective imaginations and memory.

5.5. The perception of time: when reconstruction is instantaneous

In the stories analysed, a significant discrepancy emerges between the reality of emergencies and students' representations of them, particularly with regard to the time required for post-earthquake reconstruction. In many accounts, events are compressed into an unrealistic temporal dimension, where everything is resolved within a few days or, at most, a few months. This simplified and optimistic vision fails to account for the complexity and slowness typical of reconstruction processes, which in reality often require years of work, planning, and collective effort. It is notable that, in the fourth scene, almost half of the stories depict a return to normality – or even an improvement – within relatively short timeframes, ignoring the obstacles and difficulties that characterise post-emergency recovery (Figure 6).

Only 18 accounts mention the construction of new earthquake-resistant buildings, a detail that might suggest greater awareness of the actual phases of reconstruction. This distorted perception of recovery timescales is indicative of a collective imagination that remains impoverished and disconnected from the reality of emergencies. Students tend to focus their attention on the immediate moment of the disaster and on the actions of the protagonist, without fully grasping the importance of collective dynamics and the long duration required to rebuild an affected territory. This finding aligns with broader evidence suggesting that children's temporal representations of disaster tend to be significantly compressed, reflecting a limited understanding of the prolonged and complex nature of post-emergency recovery phases (Midtbust et al., 2018). This limitation offers an important educational opportunity: working to develop a more realistic understanding of the phases that follow an emergency, helping students internalise the idea that returning to normality requires time, shared effort, and resilience. In the event of a real earthquake, a poorly realistic imagined scenario can indeed generate mistaken expectations and disorientation, making it more difficult to cope with the waiting period, prolonged changes, and the hardships of reconstruction.

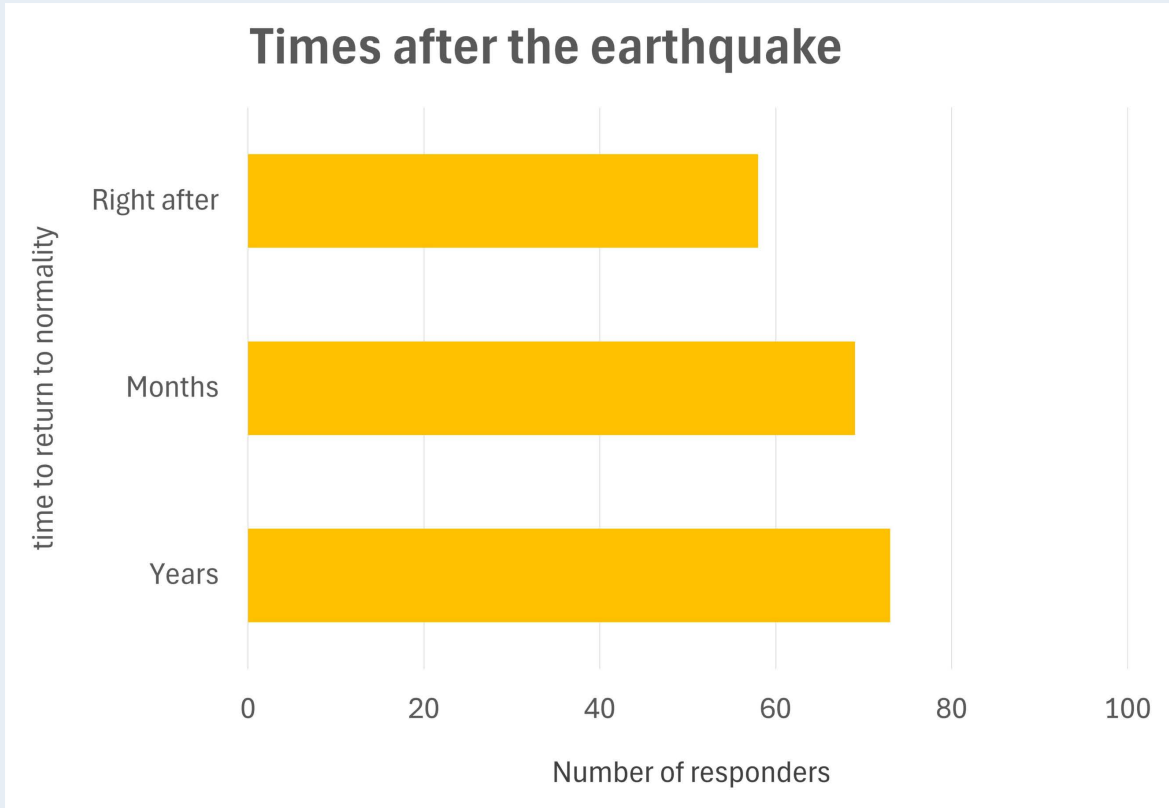


Figure 6. Students' estimate of the time required for post-earthquake reconstruction.

6. Conclusions

The analysis of the 246 stories produced by students over two school years sheds light on fundamental aspects that cannot be overlooked when discussing seismic risk education. Understanding students' imaginations means comprehending what they are prepared to respond to and, above all, identifying the limitations and gaps in their representation of an emergency.

Through the "Terremoto Immaginario" workshop, we asked students to represent an earthquake in four consecutive panels: life before the event, the earthquake itself, the immediate emergency aftermath, and the post-emergency reconstruction phase. Each drawing was accompanied by one or more sentences which, together with the images, composed stories that were subsequently shared with the class.

The collective sharing phase proved to be an integral part of the workshop: group discussion allowed students to work through doubts, fears, and strategies together, reinforcing their sense of community.

The imagined scenario that emerged from the analysis of drawings and accounts is frequently impoverished, oversimplified, and distant from the real complexity of emergencies. We identified significant limitations both in the perception of seismic phenomena and, above all, in the representation of the role of the community and institutions during the emergency, post-emergency, and reconstruction phases. What is lacking is not so much the representation of the earthquake event itself, but rather the context in which it occurs. It is as if the earthquake strikes a void – a void of place and a void of community.

Among the aspects that struck us most in the analysis were the “great absences”. First and foremost, the territory: in the stories and drawings, we do not find a real and recognisable territory, but rather a generic and schematic representation. This suggests limited familiarity with the surrounding environment – a critical shortcoming, since knowing the place in which one lives is the first step towards recognising risks and acting in a conscious manner.

Another major absence is that of the institutions responsible for emergency management. The students involved in the project appear to struggle to imagine either community support or the presence of figures such as firefighters, Civil Protection, or other organised bodies. In their drawings, absences prevail over presences: protagonists who act alone or who seek support exclusively within the family dominate the narratives, revealing a limited perception of the collective dimension of emergency response.

The actions described by students also reflect an individualistic and instinctive imagination: fleeing, running, and screaming are the most frequent reactions, while behaviours that presuppose a collective dimension (such as warning or helping others) appear only marginally.

Finally, a further significant absence concerns the perception of time. The stories flatten the temporal dimension, resolving both the emergency and the reconstruction within a few days or months. The territory is represented as a place that returns to normality “as if by magic”, with no trace of the long and complex processes that in reality characterise recovery after a disaster.

This led us to reflect on what generates such limited representations and on their implications for the community's capacity to face risk. Broadening this vision – enriching it with detail and bringing it closer to reality – is an essential component in preparing students to face risks and strengthening their resilience.

The results of the project thus highlight the importance of educational programmes that do not limit themselves to providing operational information on “what to do”,

but that engage students and teachers in deeper and more interactive activities. It is necessary to work on personal activation, on responsibility, and on active citizenship, in order to promote a collective and conscious understanding of risk.

The approach adopted in the project “A Scuola di Terremoto” is precisely aimed at filling these gaps, starting from students’ mental representations to build together more realistic and comprehensive scenarios. In this way, we can contribute to forming not only more prepared individuals, but also more resilient, solidary communities, ready to face the challenges posed by natural emergencies.

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