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# Convivere coi Rischi Naturali, Living with Natural Risks (CON.I.RI.): A Way to Act on Behaviors vs Seismic and Water-related Disaster Risk Reduction at School

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**ABSTRACT**

Citizens' proper response and responsible behaviour is crucial to cope with natural hazards. CON.I.RI. (Convivere con i Rischi Naturali - Living with Natural Risks) is an educational path on seismic and hydrogeological risk reduction by Istituto Nazionale di Geofisica e Vulcanologia (INGV) within the FCR (Future Responsible Citizens) and FCR 2.0 environmental educational projects. The on-going educational initiative was designed and started online during the COVID-19 pandemic to engage classrooms of all order schools of Sicilia region in distance learning. The main challenge is favoring the school-based disaster preparedness, as well as the difference in lifesaving skills in case of earthquake, tsunami, flood and landslides. The natural risk mitigation approach is based on full engagement of students in activities able to create skills for life in risk understanding to trigger transfomative learning. About 300 students were involved in the first year (2020-2021), 2200 students in the second year (2021-2022), more than 4500 ones in the third year (2022-2023) and about 4000 students in the forth year (2023-2024) and in the fifth year (2024-2025) of activities. The crucial phase to prevent damage is focused on reflecting with researcher on natural and human-made disasters on the environment. A simultaneous online race between all classes closes the educational program in an amusing cooperative way to develop lifesaving skills playing thematic digital serious games on safe behavior.

## 1. Introduction

Sendai Framework is to reduce disaster damage and develop resilience, particularly in educational facilities (UNDRR, 2015; Bandecchi et al., 2019).

Schools have a significant role in future citizens' disaster education, but school-based education programs in order to discover challenges and best practices are not high-quality enough or result insufficient in many countries. Training future generations to faces natural risk situations is not simple, because of the policy gaps, the insufficient financial resources and often also the

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lack of teachers' knowledge in these issues. Considering the increasing number of natural hazards, the main consequence of a Society scarcely prepared in disaster prevention is to put citizens' life at risk (Seddighi et al., 2022; Tipler et al., 2017).

More than ever, to act on behaviors vs seismic and water-related disaster risk reduction at school during the Pandemic, it was clear the need of well-designed *online learning* tools to catch the attention of students at home (Greenhow et al., 2021a; Greenhow et al., 2022b).

The effectiveness of the school disaster education is linked to students' awareness and strictly connected to a keen design of learning activities focused on natural risk mitigation and preparedness according to a proper methodology choice. The adopted reflective approach wants to favor the risk perception for an efficacy risk reduction actions of the students involved. This learning process is found to be effective in reducing the gap between intention and action [(Shiwaku & Shaw, 2008). About seismic risk, for example, the in-depth learning on the importance of knowing the risk of non-structural damage caused by earthquakes increases the common awareness on seismic risk in general and provides useful information on how to have safer homes in case of an earthquake (Piangiamore et al., 2021; Lindell, & Hwang, 2008).

## 2. Materials and Methods

*CON.I.RI.* is an INGV educational program designed to support Italian schools in *distance learning* during the COVID-19 health emergency phase.

It can therefore be customized and modulated by agreeing on seminar and webinar activities, workshop and hands-on, playful and with new digital school methodologies such as *EAS (Episodes of Situated Learning)* in which students become creators of digital products to deepen of specially designed microlearning in a flipped classroom context (Piangiamore et al., 2015; Piangiamore et al., 2016). *CON.I.RI.* has born as the INGV module within the *FCR (Future Responsible Citizens)* and *FCR 2.0* environmental educational projects, developed according to the agreement between the INGV and Associazione per lo Sviluppo SOstenibile e il Centro di Educazione Ambientale di Messina (AssoCEA Me APS). The project is divided into "Educational Paths" of civil and environmental responsibility, and it develops multidisciplinary modules by the INGV, the Consiglio Nazionale delle Ricerche (CNR) and the Istituto di Ricerca, Sviluppo e Sperimentazione sull'Ambiente ed il Territorio (CTS IRSSAT) with several partners and supporters enriching of participatory initiatives and activities on the major issues of environmental education such as Natural Risks, Climate and Desertification, Biodiversity, Natural Capital and Mediterranean Scrub, Food, Health and Wellness.

AssoCEA Me APS promotes a best practice dissemination competition every year to encourage in-depth study of the subjects dealt with by the experts to encourage the reflection at school on the interactions/connections among global environmental systems. The prizes are tablet equipment for the first, second and third classified classes, and the winning students can take part in a closing ceremony in presence. For all participant schools there is an environmental library rich in scientific volumes related to the project topics. The *Future Responsible Citizens* contest collects every year an average of 50 entries or groups of entries divided by topic, and an online and in-person awards ceremony is held each year for the winning schools. The high level of participation in the school competition and the interesting projects submitted, as well as the ongoing interaction with teachers enthusiastic in participating with their classes are constant proof of the effectiveness of the offered initiatives.

In particular *CON.I.RI.* by INGV concerns two different pathways: one on seismic risk and one on hydrogeological one. Both learning paths support *critical thinking* development on

environmental civic education issues. The educational pathways include meetings and focus groups between the researcher and classes connected at a distance.

The main aim is applying promising techniques and strategies for educating the youngest about natural hazards to instill the respect for the territory and the sustainable development through *cooperative learning* educational strategies, *"group" problem solving*, *Goal-Based-Scenarios (GBSs)* and *Inquiry Based Learning (IBL).* The social purpose is strictly connected to the enhancement of risk perception arousing behavior change through strategy of *transformative learning* and *LifeLong learning* designed actions ( Mezirow, 1997; Mezirow, 2000; King, 2005; Dirkx & Mezirow, 2006; Bamber, 2017; Shindler, 2009; Torani et al., 2019).

The *CON.I.RI.* learning paths mainly concern the difference between risk and hazard, the key concepts on natural phenomena and the social environment to spontaneously lead students and teachers to reflect on natural risks and actions to mitigate them in order to favor the fundamental role that each of us plays in protecting their territory.

The following topics are developed:

- Risk is a choice: are you aware of it?
- Let's know the earthquake. What is it? Where and why does it originate? And what about tsunami?
- Let's learn how to defend ourselves from earthquakes and tsunami or landslides and floods by adopting correct behaviors of self-protection
- Get ready! To instill the appropriate furniture choices at home, at school, at work to be safer reducing non-structural seismic risk.
- Let's read the landscape: what does it reveal about Geomorphology? And Geology?
- Let's respect our land: landslides and floods must be known to avoid them, and to live safer.
- Let's reflect on the changing climate
- Let's play! Each game deals with one natural risk at a time to avoid confusion.

About playing, the use of at least two different games dealing separately with seismic and hydrogeological risks encourages the reflection on the unlike aspects that characterize them to emphasize the correct safety choices to adopt in any case. Students, divided into competing teams (every class is a team), face tests and unexpected events to make decisions as the main actors of *real-life* challenges (de Freitas, 2006); An et al. 2016).

They eventually realize that the lack of preventative measures towards risk mitigation turned a natural hazard into a damaging event. Thus, risk management in the role-game is framed as a community issue, underlining that risky situations have an unpredictable component that we all need to be aware of. They will depict possible evolutions of the emergency that needs to have different solutions. The students involved in the educational program are required to spot hazards and vulnerability to assess risks and have a final judgement on actions that need or had to be undertaken. The learners must have a spirit of observation to evaluate the best choices in situations of risk and danger, trying to foresee the consequences.

Indeed *CON.I.RI.* is intended to:

- Develop the ability to look for the causes of events, rather than accepting with fatality the consequences;

- Grow sensitivity to safety and human life preservation problems;
- Foster awareness of the environment surrounding one's territory and of the natural phenomena, which all too often man fosters to become catastrophes, and thus know how to prevent with conscious and responsible behavior the natural risks.

Since the second year of the project, all activities become available online, thanks to the introduction of a new digital tool: the project Padlet. *CON.I.RI* module and the other ones within *FCR 2.0* project can be consulted according to the teachers' and students' needs, favoring the inclusion of Special Educational Needs (BES) and Attention Disorders (DSA) students as well. Anyone involved in the project can access easily and independently to padlet to review the recordings of the lessons, the live meetings, the discussion exchange between experts and classes, the selected video-pills, to consult and download in-depth materials (publications, videos, games, useful links for exploring key concepts), to test themselves with quizzes, to consult the calendar of activities, the call for papers and project communications, as well as the materials that are gradually uploaded as the activities proceed. Special activities and the closing and award ceremony are also available for teachers on the Padlet: https://padlet.com/AssoCEA_Messina_APS/FCR20 (Figure 1). The materials are enriched as the activities develop and according to teachers' requests. Experts remain available for clarifications, activities and additional agreed and customized interventions.

The *CON.I.RI. (Convivere con i Rischi Naturali - Living with Natural Risks)* approach is the response of Research to this need, an example of what Research and School can do together proving to be the perfect couple for acting on prompt safe behaviors in case of Earthquakes and Tsunami or Landslides and Floods occurrence. Geosciences dissemination meets education in the belief that spreading knowledge and awareness are the basis for building resilience at school, involving students, teachers, and also headmasters and families with a focus on the relationship between natural disasters and social and cultural misbehavior (Yeager & Dweck, 2012). *Active learning* is preferred to encourage good practices of self protection, fostering activities that give space for creativity by teasing emotional intelligence and school well-being challenged by the Covid-19. The *CON.I.RI.* school-based disaster preparedness experience aims to provide lifesaving skills and all the eight key citizenship skills from the European Recommendation of 22/5/2018:

1. Learning to learn: organizing one's own learning, identifying, choosing and using different sources and various (formal, non-formal and informal) information and training, including according to the time available, one's own strategies and one's own method of study.
2. Planning: carrying out projects concerning the knowledge learned to establish meaningful and realistic goals, assessing existing constraints and possibilities, defining strategies of action and verifying the results achieved.
3. Communicate and understand messages of different genres (daily, literary, technical, scientific) and of different complexity, conveyed using different languages (verbal, mathematical, scientific, symbolic, etc.) through different media (paper, computer and multimedia) to represent events, phenomena, principles, concepts, norms, procedures, attitudes, moods, emotions, etc. using different languages (verbal, mathematical, scientific, symbolic, etc.) and different disciplinary knowledge, using different media (paper, computer and multimedia).
4. Collaborate and participate: interact in groups, understanding different points of view, valuing their own and others' abilities, managing conflict, contributing to common

learning and to the realization of collective activities, in the recognition of the fundamental human rights.

5. Acting autonomously and responsibly: knowing how to actively and consciously insert oneself in social life and assert within it one's own rights and needs while recognizing those of others, common opportunities, limits, rules, responsibilities.
6. Problem solving: dealing with problem situations by constructing and testing hypotheses, identifying appropriate sources and resources, collecting and evaluating data, proposing solutions using, according to the type of problem, contents and methods of the different disciplines.
7. Identifying connections and relationships: recognizing and representing, by elaborating coherent arguments, connections and relationships between different phenomena, events and concepts, even belonging to different disciplinary fields, and distant in space and time, grasping their systemic nature, identifying similarities and differences, coherences and inconsistencies, causes and effects and their probabilistic nature.
8. Acquiring and interpreting information: getting and critically interpreting information received in different fields and through different communication tools, assessing its reliability and usefulness, distinguishing facts and opinions.

*CON.I.RI.* is designed to also sensitize adults by using children as a vehicle of information (MIUR, 2007; Pampouri, 2021). This challenge can partly be addressed through successful strategies of participative designed game activities to implement on risk prevention and reflection on scientific phenomena behind disaster for a *LifeLong learning* which becomes a real *tranformational learning*, due to a constructive and meaningful learning process which is not a simple acquisition of knowledge, but trigger the development of *critical thinking*, which is fundamental for safety and civil protection correct choices (EC, 2006; Mori, 2012; Ritterfeld et al., 2009; Rugelj, 2016; Musacchio et al., 2015; Reyes-Fournier, 2017; Reischmann, 2014; Kaplan, 2016).

The strength of the *CON.I.RI.* activity as a whole lies in the continuous exchange between teachers and the INGV researcher, who acts as a point of reference throughout the school year while teachers tackle the natural risk topics independently in their classrooms.

For the evaluation of the effectiveness of the project and to improve it, questionnaires are available on a google form targeting teachers and students inherent to the different modules in order to accommodate suggestions and criticism to enhance educational on-going action.


Figure 1: Padlet digital active tool available since 2021 within the FCR 2.0 project. CON.I.RI. meetings, materials and news are highlighted in red.

## 2.1. *CON.I.RI.* Special Event to Spread Best Practice

The tested *Salvina's Adventures* digital educational game series designed by INGV, were played online with all classes involved in the special scientific events and closing award ceremony of the *FCR and FCR 2.0* projects on occasion of the World Environment Day every June 5th. One of the *Salvina's game* collection is every year the *ludendo docere* surprise by INGV for schools to close in an amusing collective way the activities developed during all the school year long (Malone & Lepper, 1987). In particular, the *Salvina and the Earthquake* was played by 300 students from 14 classes of Primary (ISCDE 1) and Middle Schools (ISCDE 2) from Sicily, and raced the quiz online within the *CON.I.RI.* module at the end of the first year of the *FCR* project in occasion of the opening of the *United Nations Decade for Restoration for World Environment Day 2021.* Then, the *Salvina and the Environment* was played by about 1600 students. In particular, about 600 pupils from 28 classes of primary schools and just shy

of 1000 students from 41 classes of middle schools from Sicily, at the close event of the *FCR 2.0* project during the *World Environment Day 2022* within the *CON.I.RI.* educational path (Piangiamore & Maramai, 2022).

The *FCR 2.0* project, exclusively online and reserved to Sicilian schools has become national during the current school year by including pilot schools from Central and Northern Italy.

A special in-person event was dedicated to the topics of the INGV *CON.I.RI.* module and organized in Palermo on April the 4th, 2023 together with the Civil Protection Department and in collaboration with CAE-Innovation for a safer world, which provides advanced technologies for monitoring environmental risk due to natural phenomena, specially warning systems for hydrogeological risk mitigation. The public engagement venue also included "Pasta and beans...with oil - the Mediterranean diet is good for you", the new learning path within *FCR 2.0* project since the 2022-2023 school year. The special educational day involved about 90 students of the third class of middle school of the “De Amicis Da Vinci” Comprehensive Institute of Palermo (Figure 2).

The initiative was promoted by AssoCEA Messina APS in collaboration with the Nodo InFEA of the Metropolitan City of Messina and organized by INGV in collaboration with the Regional Civil Protection Department, CAE Spa, I.Di.Med. (Istituto per la Promozione e la Valorizzazione della Dieta del Mediterraneo) and Legumi Siciliani. Partners in the initiative are ARPA Sicilia (Regional Agency for the Environmental Protection), Slowfood Sicily, and the Sigea Sicilia Association for the Promotion of Earth Sciences, as part of the Environmental Education program.


*Figure 2: Posters of the in-person special events dedicated to the topics of the INGV CON.I.RI. educational path organized in Palermo in 2023 in collaboration with the Civil Protection Department and CAE Spa within the FCR 2.0 project.*

In this special event *CON.I.RI.* activity for school was totally *game-based learning*, dealing with complex scientific concepts concerning natural risks issues in a simple and fun way two classes a time in only one hour meeting with the researcher. The INGV educational tool adopted was the multi-hazards *Risk Detective* (Seismic and Hydrogeological Risk) table game, adapted to the occasion for students involved to instill the automation of rigth behaviors choices in daily life in the case of earthquakes, tsunamis, floods and landslide through play. *Risk Detective* games were implemented by INGV on funding from the 2015 MIUR-DCS call for the Dissemination of Scientific and Technological Culture (M@Ter 2.0 Earth-Sea Planet project) dealing with hydrogeological (floods and landslides) and seismic hazards (https://riskdetective.wordpress.com/, https://ingvambiente.com/2020/03/16/risk-detective/). The ages 9-11 target game paths have been adapted for ages 13-14 students by increasing the difficulty of some tests and quizzes. The *Risk Detective* races beetween group of students were

an opportunity for the researcher/conductor to make future citizens to reflect on natural and human-made disasters, according to educational strategies of Cooperative learning, "group" problem solving, Goal-Based-Scenarios (GBSs) and Inquiry Based Learning (IBL), (Piangiamore, 2018; Slavin, 1980; Abramczyk & Jurkowski, 2020; Maraffi & Sacerdoti, 2018; Maraffi & Sacerdoti, 2017), (Figure 3).

A similar *CON.I.RI.* special venue took place in Palermo on November the 23th, 2023 in the same school.


*Figure 3: On the left: Risk Detective game-learning activities during the special events dedicated to the topics of the INGV CON.I.RI within the FCR 2.0 project. On the right: the starting moment of the special venue.*

The *CON.I.RI.* module set up a series of dedicated in-person classroom meetings during the month of April 2023 for the Northern Italy pilot school included in the educational program since the 2022-2023 school year. About a hundred children of the fourth classes of the "E. Venturini" – ISA 5 primary schools of La Spezia were involved in additional activities especially designed for them. Classes involved, had already participated with the teachers to the online meetings at distance and explored the Padlet materials within *FCR 2.0* project. When the expert met children at school, she conducted in presence in participatory way the competition of the *Risk Detective* game, stimulating children about the importance of proper land use and territory maintenance. The players faced with great enthusiasm a series of tests, each of which is associated with a score to win and receive the *Risk Detective* certificate. Thus, the INGV researcher dealt with the educational topics of interest, getting the pupils to reflect by a curiosity-driven approach in an emotional and engaging way. Then, to enforce learning, there was the experience of the geological excursions to the 5 Terre to "read" the landscape from the perspective of hydrogeological risk prevention (Farabollini et al., 2014). The in-depth activity on geological themes started from children's observations of the rocky outcrops of Vernazza, Manarola and Monterosso using induction learning methodologies. Inductive reasoning has begun from particular cases of containment systems for hydrogeological instability directly observed by pupils. Therefore, starting from protection measures surrounding the learners, the researcher was facilitated to generalize the scientific concepts, letting even very complex actions simple in the most different simulations of real dangerous situations, and favouring *emotional intelligence* and *soft skills* development in matters of hydrogeological risk mitigation (Bachelard, 1995).

The *Risk Detective* INGV in person activities were the protagonist also of thethe close event of the *FCR 2.0* project during the *World Environment Day 2024* within the *CON.I.RI.* educational

path involving in a special educational day about 100 students of the third class of middle school of the "Quasimodo" Comprehensive Institute of Agrigento.

## 3. Results

*CON.I.RI.* promotes student learning, especially the identified 8 citizen skills. The project is intended to:

- Develop the ability to look for the causes of events, rather than accepting with fatality the consequences;
- Grow sensitivity to safety and human life preservation problems;
- Foster awareness of the environment surrounding one's territory and of the natural phenomena, which all too often man fosters to become catastrophes, and thus know how to prevent with conscious and responsible behavior the natural risks.

This INGV educational program for teaching students about disaster preparedness was designed to support schools in distance learning during the COVID-19 health emergency phase, but it is also on going, always enriching itself with new initiatives. Padlet is a tool to facilitate participation and inclusion of students with learning difficulties.

Students are engaged in the program and they found it "playful" and pratical, as reported on evidence, provided by the satisfaction questionnaires administrated to students and teachers to gather feedback for improving *CON.I.RI.* future activities.

For example, about the question for teachers "How useful do you believe activities such as *CON.I.RI.* can be useful for teacher to develop new ideas for teaching?*",* the feedback received is "much" (65%) and "very much" (35%).

And about the question for students: "Did you find *CON.I.RI.* activities interesting and/or useful?"*,* the feedback received is "not very interesting and/or useful" (9%) and "very interesting and/or useful" (91%).

After the meetings with the INGV researcher, they design creative projects to promote awareness and dissemination of best practices by participating in the annual *FCR 2.0* project competition. Accordingly they have the opportunity to compete in teams in online and in-person contests during special events with INGV and Civil Protection and at the final meeting at the end of the school year. On these occasions, very positive feedback was gathered, not only by evaluating the entries in the competition with a jury of experts, but also by administering pre- and post-questionnaires to students to assess the effectiveness of their learning.

The performed tests provide data about the achievement of student learning outcomes.

*CON.I.RI. - Living with Natural Risks* concerns on seismic and hydrogeological risk reduction action by INGV within the *Future Responsible Citizens* environmental educational project, which was declared a Project of Excellence in the 'Networks and Training Systems' Section at the *19th Edition of the Filippo Basile 2021 Prize for Public Administration.* In its new and more high-tech version *Future Responsible Citizens 2.0* was again declared a Project of Excellence in the 'Networks and Training Systems' Section at the *20th Edition of the Filippo Basile 2022 Prize,* and also at the *tenth edition of the Zero Waste Living Award* in the presence of the Good Practice Ambassadors 2022. *CON.I.RI* educational paths was awarded second prize as effective training practices and special mention from the Scientific Committee for the 'Sustainability' theme at the award ceremony of the *23th Edition of the Filippo Basile 2025 Prize* at University of Cagliari. The project was then presented by invitation at the 'Showcase

of Excellence in Public Administration' of the 2025 edition of the AIF 'Filippo Basile' National Award at University of Turin and it has been publicly recognised as an overall very strong and successful programme.

The *CON.I.RI. challenge based learning* approach wants to increace the perception of natural risks and to strengthen the Civil Protection capacities on seismic and hydrogeological risk awareness by means of full engagement of students in activities able to create skills for life in risk understanding to trigger *transformative learning* for a safer Society (Taylor, 2001; Boyd & Myers, 1988; Brookfield, 2000; Kitchenham, 2008; Howie & Bagnall, 2013; Shaw et al., 2004; Johnston et al., 2005; Salvati et al., 2014; Miceli et al., 2008; Maidl & Buchecker, 2015; Scolobig et al., 2012; Hernández-Moreno & Alcántara-Ayala, 2017).

*CON.I.RI.* address school orders with differentiated language and activities according to pupils' and students'classes. At first, the module was designed from the third class of primary school to the third class of the middle school and divided by age groups. Having received a lot of demonstrations of interest from upper secondary schools (ISCDE 3) and great demand from kindergarten (ISCDE 0), we expanded the target audience to younger and older learners **s**ince the second year of project activity (Baytiyeh & Öcal, 2016).

*Ad hoc* initiatives are coming up to best fit the different ages. In particular, for toddlers up to the second grade of elementary school, meetings become shorter and based on fairy tales, rhymes, animated drawings, and pleasant videos (Carone & Marincioni, 2020).. The *CON.I.RI.* educational path was also enriched for the little ones with the *GeOrigamiLab "Paper Volcanoes Laboratory"*, conducted in presence in some kindergarten thanks to the help of the INGV colleagues on the Sicilian territory who conducted the activities at school as soon as the restrictive protocol of the Pandemic was revised (Amici & Castello, 2021).

The educational program reaches a much wider catchment area than the first edition of *FCR* project during the 2020-2021 school year (a total of about 300 children, half of whom from elementary school and half from middle school belonging to 5 comprehensive Sicilian schools). Thus, the initiative targeted schools in all provinces of the region of Sicily and included more than 2.200 students participated in the *FCR* 2.0 project during the 2021-2022 school year, including 24 Sicilian comprehensive institutes for a total of about 300 kindergarten students, 600 elementary school students, 1.000 middle school students and 350 secondary school students. The scholastic community involved in learning experimentation continues to grow and for the current 2024-2025 school year schools and students involved are more than double of the last edition, reaching not only the entire Sicilian territory, but also a sample of schools in Central and Northern Italy.

### 3.1. Discussion and Conclusions

The *CON.I.RI.* on-going activities started during the pandemic to support all order schools to convey the culture of safety in a new way. Online meetings with the researcher were the occasion to reflect on natural and human-made disasters on the environment. The main goal is to develop in future citizens a greater awareness of the hazards present in the territory in which they live, and to prepare them to be able to react and act appropriately in case of earthquake, tsunami, flood and landslides (Piangiamore et al., 2012).

Overall, the various activities are based on the scientific method for STEM, which allows students to be taught by focusing on real-world applications from a problem-solving perspective. "Learning" is not "memorizing", but "understanding", and it is developed in the environmental and social context. The meetings with experts start with the *knowledge area* on the scientific phenomena separately developed for their greater understanding. The researcher's

experience provides insights into risk perception and triggers spontaneous questions that students will seek answers to in a dedicated interactive meeting. The basis is thus created for the *final action area*, which aims to prompt behavioral change in the case of extreme natural events. Then, in order to more effectively teach *life skills*, which are indispensable competences for the educational success of the citizens of the future, we use *game-learning* techniques (Valentini, 2023; Maraffi et al., 2017; Maraffi & Sacerdoti, 2017)..

Through playing it becomes clear what contribution we can make to Society for a more sustainable future. The playing activity in a collaborative, relaxed and welcoming climate is very functional for becoming critically aware.

Gaming activities are designed to be played in a serene and fruitful climate made up of skits, narratives, interviews, and discussions (*warming up*); then the players are asked to identify with different roles and hypothesize solutions (*action*); therefore they step out of the roles and the game to get back into the swing of things (*cooling off*); later on they analyze, comment on and discuss what has happened *(analysis*), (Piangiamore, 2018).

The educational games are realized to activate *reflective learning* to prompt *life long tranformational learning* for automatic safe behaviors adoption. The multidisciplinary approach is managed by the researcher, from "dispensers of knowledge" to facilitator of deep meaningful learning process as the meetings progress enriched with participatory *game-based learning* activities designed to rework significant observations and considerations after any scientific competition. Students became players flanked by their teachers during the simultaneous race between classes (Lam et al., 2004; Di Menichi & Tricomi, 2015).To win they must cooperate in order to search and find the safer choice to adopt to protect themselves and others, adapting to different natural risks. The closing online ceremony for schools becomes a tool of disaster prevention education every year, underlining how to save ourselves in case of different natural phenomena. Indeed, the final online contest between classes is based on *cooperative learning* and followed by an important researcher-driven *debriefing* moment to deepen the knowledge acquired during the previous project phases (Johnson & Johnson, 1989; Perkinson, 1984; Hsu, 2008; Berkson & Wettersten, 1984; Priest & Roach, 1995).

This is the most important phase to receive genuine feedback from users of the project as a whole. Now the School and Research meeting provides an opportunity for shared reflection that enriches the experience of all participants (students, teachers and researchers alike).

The special online competition, where all involved schools are invited to race during the World Environment Day, ends the project activities every year encouraging collective reflection on the importance of behaviour change vs right individual choices to guarantee the well-being of the whole community.

These participative activities embracing innovation in gamification at school are particularly appreciated, as reflected in the positive and enthusiastic feedback noted in the satisfaction individual short and simple questionnaires distributed to teachers and students at the end of the school year activities for the evaluation of the project in order to keep improving. Customer satisfaction have been misured the users' fulfillment and tested the enjoyment and the efficacy of our curiosity-driven approach and *game-based learning* activities. The answers and the gathering comments and suggestions collected are a further confirmation of the high appreciation and interest of both students and teachers, according to the feedback publicly received in the live chat comments during the online events.Acknowledgment

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