EGU24 - Session EOS1.7 **Challenges and opportunities in risk communication related to natural and anthropogenic hazards**

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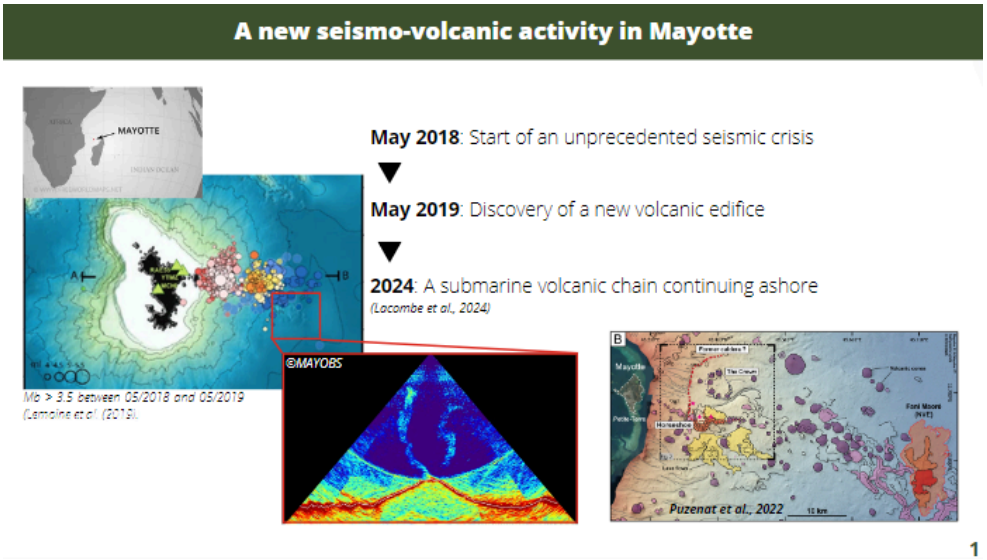
Presentation: School teachers as partners in a disaster risk reduction context: challenges and benefits highlighted by Mayotte case study in France

Speaker: Louise Le Vagueresse

Hello everyone, I am Louise Le Vagueresse, a PhD student in the Institute of physics of the globe in Paris directed by Maud Devès and Robin Lacassin. I will discuss challenges and benefits of working with school teachers for better scientific information in a context of disaster risk reduction. My case study is the French overseas department of Mayotte.



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Mayotte is a volcanic island, but this volcanic activity ended long before the arrival of human populations on land. However, In May 2018 started an unprecedented and unexplained seismic crisis which led to the discovery one year later of a new volcanic edifice erupting offshore. Today we know that this edifice is part of a submarine volcanic chain with possible links to volcanic structures ashore and my colleagues are still investigating whether or not these volcanic structures could be reactivated in a not too distant future.

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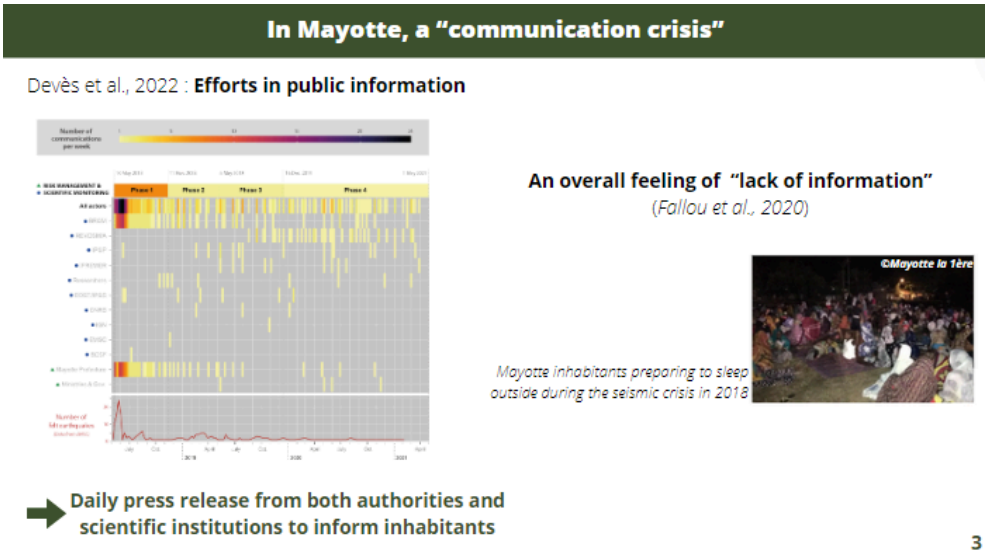
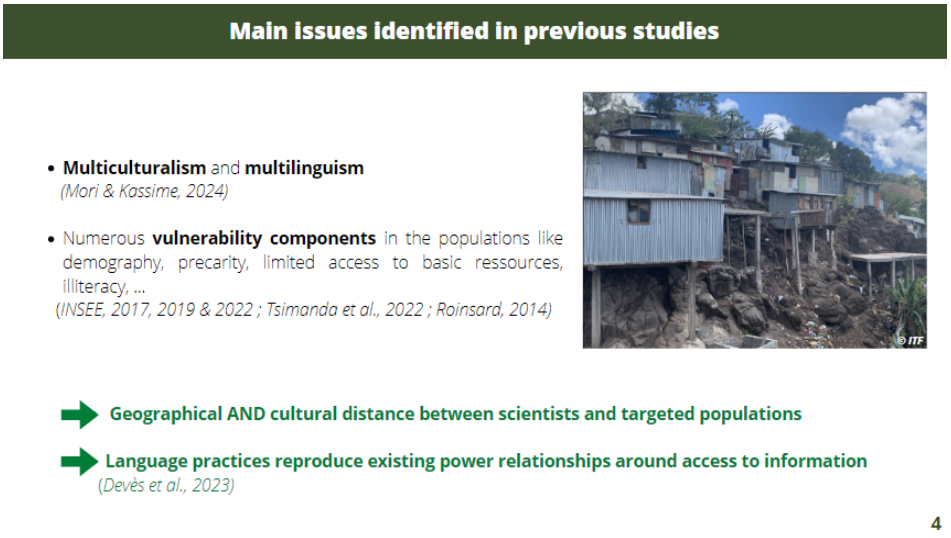
I think everybody in this room is already convinced that informing at-risk population is key for disaster risk reduction. I will just quickly remind that there are also growing expectations from societies for better scientific information with sometimes legal

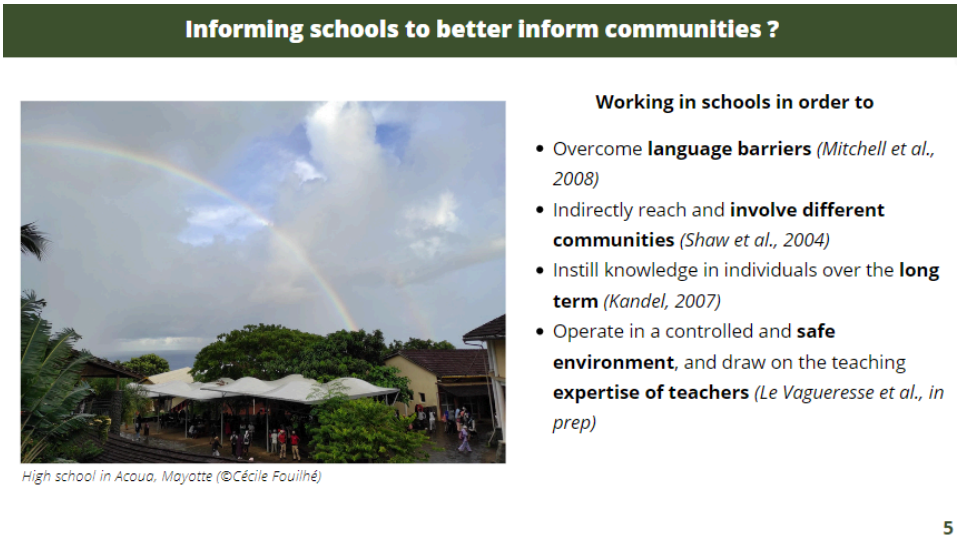
implications, as illustrated with the case of White Island volcano last eruption and the ensuing trials.



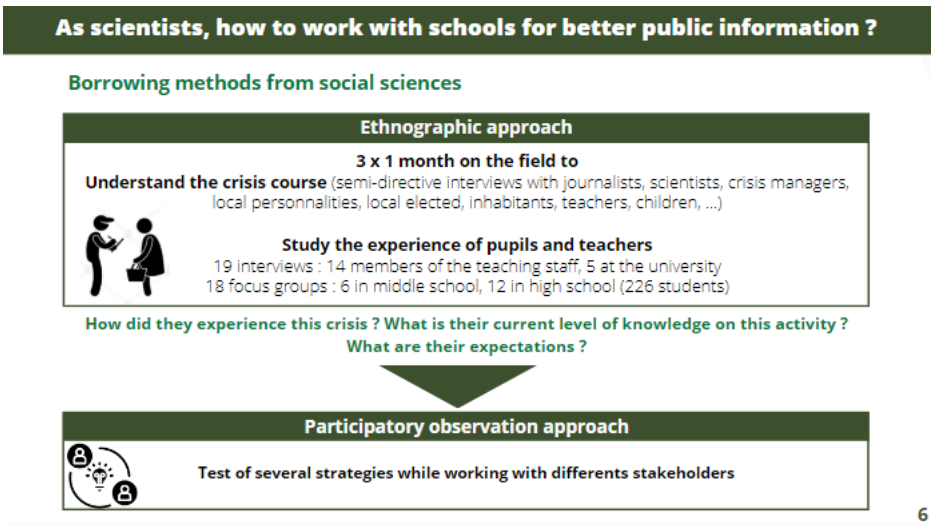
In Mayotte, efforts were made for public information, as highlighted by a study by Devès and associates in 2022, especially at the very beginning of the seismic crisis where press releases from both authorities and scientific institutions were published daily to inform inhabitants. However several social studies evidenced a feeling of lack of information among populations which led to anxiety, fear, and ultimately mistrust toward authorities and even scientists.



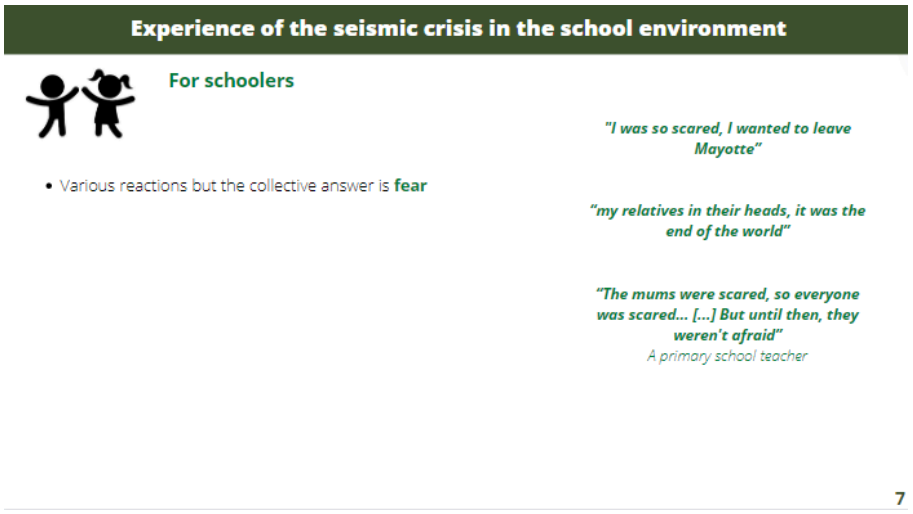
Several issues were identified to explain this gap. Among them: multiculturalism and multilingualism and also numerous vulnerability components among the populations like a soaring demography, a high rate of precarity, limited access to basic resources such as water and important illiteracy in French. So overall, what is important to keep in mind is that there is a geographical and cultural distance between scientists who are studying these phenomena, who mainly come from and live in mainland France and who speak French, and targeted populations. Another study also highlighted language practices among stakeholders reproducing existing power relationships around access to information which hinder the circulation of this information.



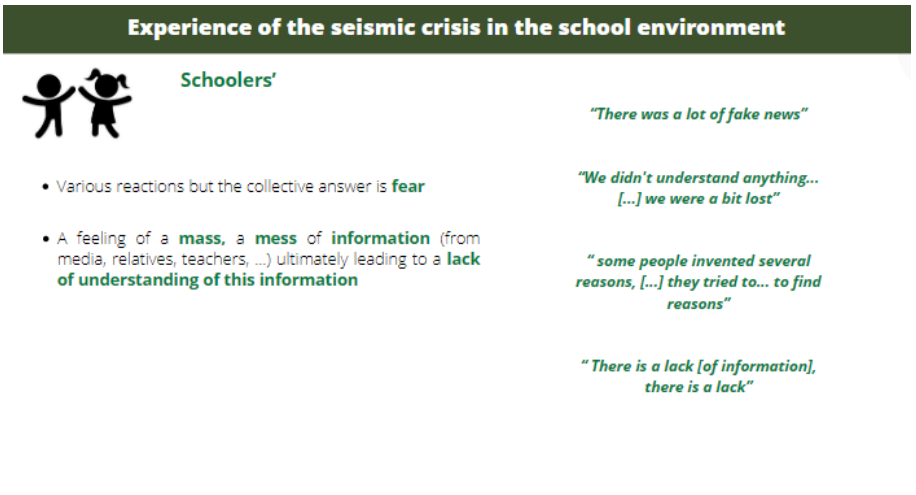
There are other cases of multicultural communities exposed to natural hazards around the world and in those contexts, several studies proposed to work with schools in order to overcome language barriers and indirectly reach and involve different communities while instilling knowledge about hazards and risks in individuals over the long term. I would also add that it's a good way for us as researchers to operate in a safe environment and to have the opportunity to rely on the teaching expertise of school teachers to address this public.



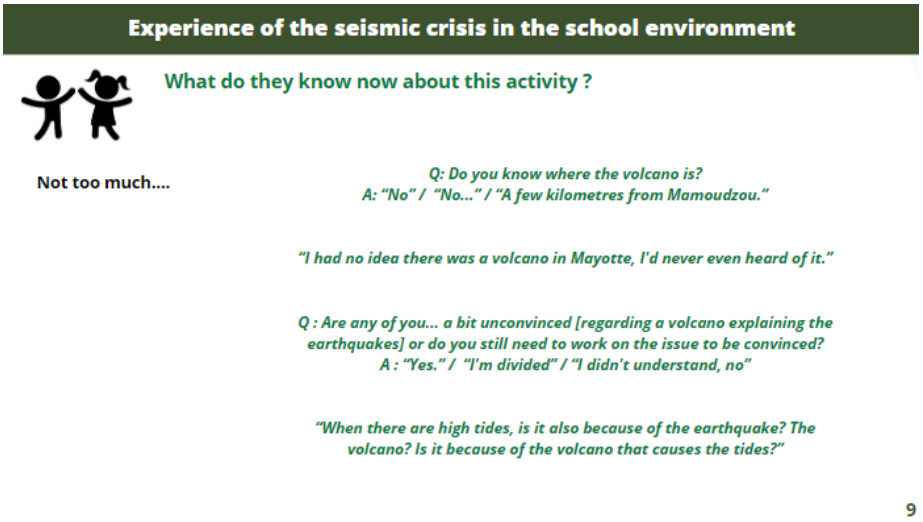
So, how to work with schools to improve public information ? How did we proceed ? First, we conducted a social study using an ethnographic approach in order to better understand the crisis course and to study stakeholders' experiences and representations, and I especially focused on the experience of pupils and teachers. I was interested in how they experienced the seismic crisis, what is their current knowledge on this activity and what are their expectations in terms of information regarding those phenomena. Then we drew on these results to implement several projects with different stakeholders in order to test strategies targeting this public.



First, a few words regarding the experience of the seismic crisis among schoolers. There were various individual reactions, but they collectively agreed that they experienced fear during these events. Analyzing the testimonies, It appeared that part of this fear actually came from their relatives, especially their mums. It was a collective fear that made them scared, more than what they experienced of the earthquakes by themselves.

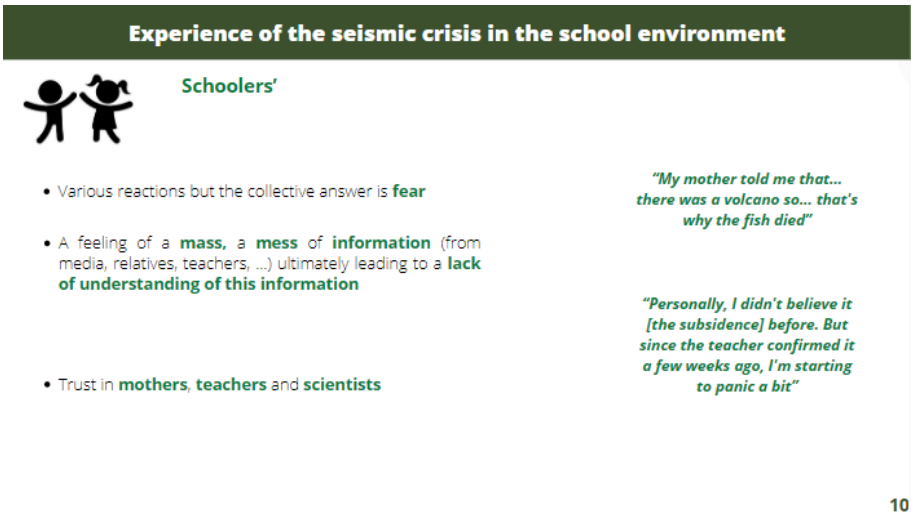


Regarding the feeling of the lake of information, we found out that it was more about a lake of understanding the information provided. Indeed, the schoolers expressed a feeling of a mass of information which led to a mess of information, if I could say. They mentioned a lot of fake news, very different explanations from very different sources, contradictory information and a lack of hierarchy among this information that let them to feel lost and prevented them from understanding anything about what was happening.

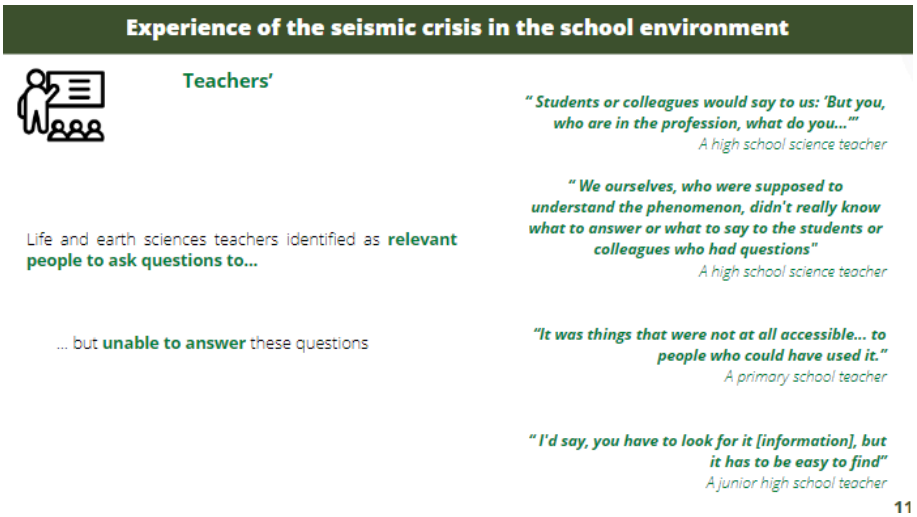


And indeed, when I asked them about what they do know now regarding this activity, it appeared that it was not too much. Most of them do not know the basic characteristics of the new volcano. Some of them didn't even know that there was a new volcano or were unaware of the volcanic history of Mayotte. They also doubted that the volcanic activity could have generated the earthquakes because they didn't understand the link

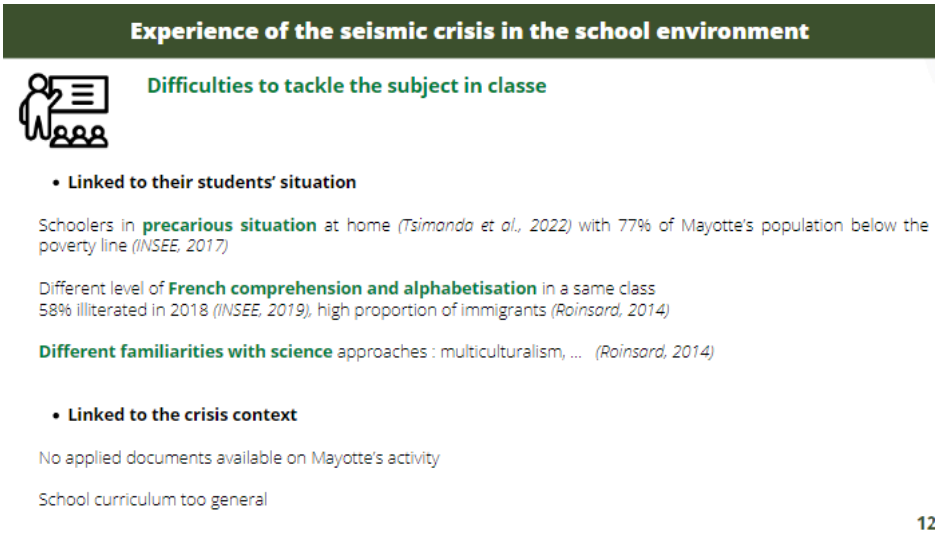
between earthquakes, volcanic activity and deformation. They also had a lot of questions which revealed a lack of basic knowledge about natural phenomena such as tides, tsunami, earthquakes, volcanoes, how they differ from each other and how they could be linked to each other.



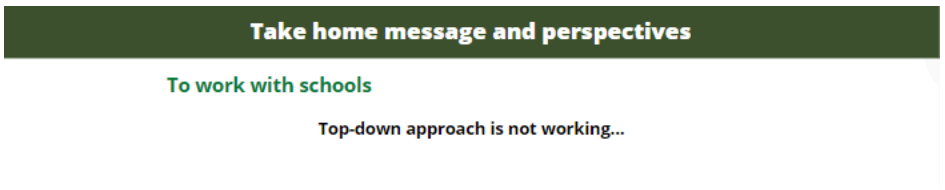
Their most trusted sources were, first, their mothers, which is compatible with the fact that Mayotte is a matriarchal society, and in second position, we found that the teachers are really respected and trusted. Here you have the example of a testimony by a schooler who shared that he didn't believe about the subsidence of the island before (linked to the magmatic chamber), but since the teacher confirmed it, he is starting to panic a bit. A few schoolers also mentioned scientists such as seismologists or geologists, as trusted sources, but they were a minority.



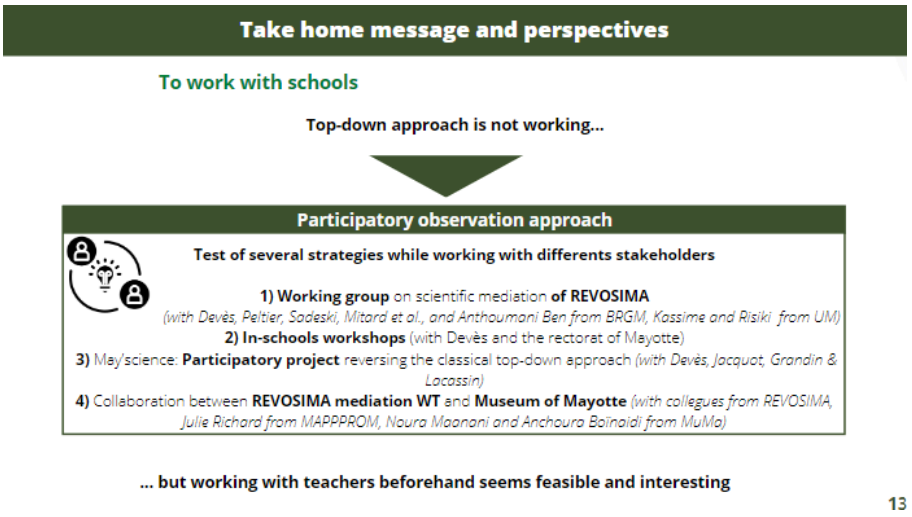
Regarding teachers, one of the most important findings is that Life and Earth Sciences teachers both identified themselves and were identified, by their students, colleagues, hierarchy and friends, as relevant people to answer questions about these phenomena. However they found themselves unable to answer these questions because they didn't have information which they said was lacking or not easy enough to access. Several of them regretted that this information was “not at all accessible to people who could have used it”.



Teachers identified two main categories of difficulties preventing them from tackling this subject in class. The first one is linked to their students’ situations and the general school context in Mayotte. Indeed, some schoolers live in very precarious situations at home and classes are very heterogeneous with very different levels of French comprehension and alphabetisation and also different levels of familiarities with science approaches due to multiculturalism. They also expressed difficulties linked to the crisis context. They mainly tried to overcome the lack of information by relying on the school curriculum to explain the phenomena. However, they shared that it was not sufficient, either because the chapters were not treated for some school levels or because those chapters were way too general. They also expressed that they wished to have more applied documents available on Mayotte’s activity in order, first, to illustrate the school curriculum with a local case study and also to be able to go into more details while explaining what happened to the schoolers.



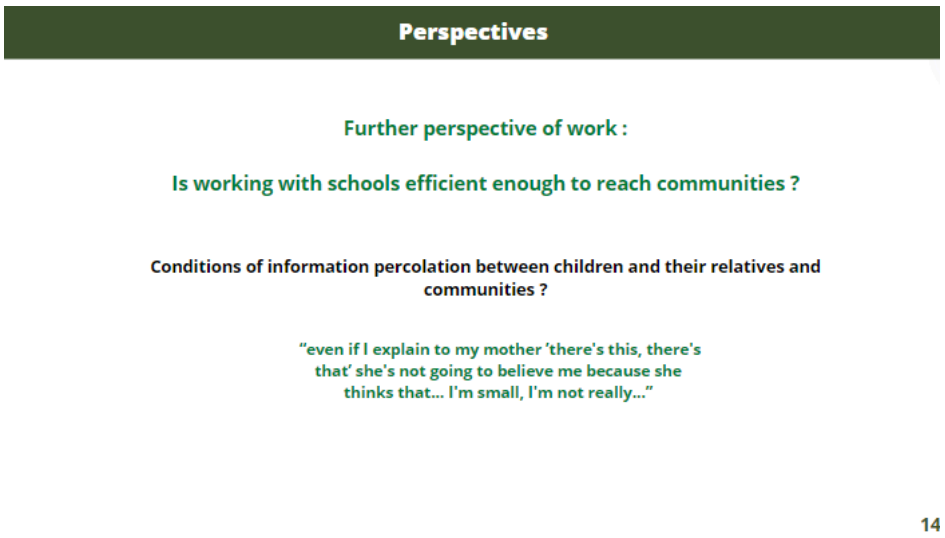
What to remember from this study ? First, top-down approaches do not work. However, school teachers, and life and earth sciences teachers especially, seem to be relevant contacts and intermediaries on the field. First because they know their classes and the socio-cultural context of their students and can provide upstream pieces of advice regarding this public and ensure conditions for better inclusiveness. They also appear to be trusted sources for their students and colleagues. In addition, they are willing to access and disseminate this information, both to answer students' questions and to link the curriculum to a local case study in order to enhance students' interest and intellectual development.



Drawing on these results, we have several projects ongoing.

First, there is a working group on scientific mediation among Mayotte volcanological and seismological monitoring networks, of which I am a member, which develops and spreads popularized content through a mailing-list addressed to the different stakeholders, and among them school administrations and school teachers. This working group is also involved in the conception of an exhibition on this volcanic activity by the local Museum whose public is mainly made up of school classes.

As part of my thesis, I developed two workshops for secondary schoolers, with inputs and feedback from both geoscientist colleagues and local teachers. Finally, we implemented a participatory research project with a local school teacher aiming to assist schoolers while they develop information formats on this activity destined to their relatives, reversing the classical top-down communication approach.



However, one important question remains: is working with schools efficient enough to reach communities ? There are very few studies in the literature examining the conditions of information percolation between schoolers and their relatives. These conditions may be linked to the communities’ perception of science, French schools education and children themselves and would thus vary depending on the socio-cultural context. This needs further investigation.