Seeking public engagement with Geodiversity

Rodrigues, J.[1,2], Costa e Silva, E.[3] & Pereira, D. I. [1,4]

[1] *Institute of Earth Sciences, Pole of the University of Minho, Portugal*
[2] *Naturtejo UNESCO Global Geopark, Portugal, joana225@gmail.com*
[3] *Communication and Society Research Centre, University of Minho, Portugal*
[4] *Terras de Cavaleiro UNESCO Global Geopark, Portugal*

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Communicating Science: taking Geoscience to public

For scientists one of the main barriers between Science and Society is the public's perceived knowledge deficit and their lack of interest. Beside these barriers, common to several scientific areas, Geoscience has also to deal with its poor visibility and recognition. Non-experts are still far from understanding the Geodiversity's role in everyday life and its importance in reaching effective sustainability for the planet.

However, ensuring the protection of Geodiversity is not only in the geoscientist's hands. All the society needs to be implicated. Institutional and collective efforts and initiatives to bring Geoscience and Geodiversity to the public are well known all over the world and many geoscientists have been making impressive efforts to bring these topics for the public and media agendas. Due to the considerable role of geosciences in society, even if it is not always recognized, communication must be a fundamental activity for geoscientists (Martin & Peppoloni 2017) and despite the different conditions, practices or motivations, Geoscience Communication has become one of the everyday duties of many geoscientists (Illingworth et al 2018).

To engage society with Geodiversity it is not enough to promote scientific literacy. People's experiences and perceptions need to be incorporated and it fundamental to establish a commitment between society and science based on dialogue, where non-experts become also protagonists in scientific decisions with social impact and integrate their knowledge in public participation and decision-making. Values and beliefs shape public perceptions on Geoscience issues and geoscientists have to change the paradigm from "matters of fact" to "matters of concern" (Stewart & Lewis, 2017). Scientists need to understand that objection and controversy are not only result of bad communication or lack of knowledge (Gibson & Roberts 2018). Through Public Engagement with Science and Technology, non-experts become protagonists in scientific decisions with social impact and integrate their knowledge in public participation and decision-making (eg Bauer et al 2007). Recent studies also warn that the attitudes towards Science combine knowledge with confidence nonlinearly and scientists, that tend to assume that if they teach the concepts and communicate facts, the audience would then think alike, face even more challenges (Francisco & Gonçalves-Sá 2019).

Geoscientists perceptions and practice

To understand the perceptions and experiences of geoscientists regarding Science Communication, in Portugal, a survey with 179 respondents was conducted. It is expected that this research shows the main factors that influence the communication practices and the differences within specific fields of Geoscience. Preliminary analysis of the results show that geoscientists are aware of the importance of communicating Science and they are interested in communication activities. 91% considers it somehow important to find time to engage with non-specialist audiences, under the scope of their professional activities and 86% agrees that public engagement with Science is personally rewarding. 90% thinks that scientists have a moral duty to engage with non-specialist audiences about the social and ethical implications of their work. Concerning the number of activities they do per year, 40% of the respondents thinks that it is reduced and only 30% that the number is good or very good.

Regarding specific communication skills, 44% doesn't agree that lack of preparation or training can be an obstacle and only 6% of the geoscientists surveyed admit that they don't feel prepared and with the skills to communicate. 16% say they were very well prepared and 78% report that they feel moderately or well prepared to communicate. Analysing other potential barriers, 61% agrees (fully or moderately)

that lack of public knowledge is an obstacle to communicate Science and 64% agrees (fully or moderately) that lack of public interest may be a barrier. Regarding personal goals when communicating, 84% fully agreed that they aim at allowing citizens to make more informed decisions and 83% fully agreed that they aim at ensuring that the public is better informed about Science and Technology. Public's knowledge is clearly pointed out as an important topic that motivates scientists to communicate.

Concerning the media, 82% doesn't think that the news coverage of Geosciences is adequate and 86% considers that media are more interested in sensationalism than in scientific truth, with 75% pointing out misrepresentation of scientific content by journalists as an obstacle for Science communication. These results show a significant gap between scientists and journalists, where 93% never or rarely participated in media debate, 93% never or rarely sent a press release with scientific content, 91% never or rarely did an interview for the media and 91% never or rarely wrote an opinion text for non-specialist media.

Focusing on communication tools, videos, TV interviews and social media posts are among the ones considered most effective. Universities, Science centres, Geoparks and popular science magazines are among the entities that the surveyed Geoscientists most trust to communicate Geoscience.

About engagement activities, 67% admitted they never did any Citizen Science activity, 60% never participated in a focus group, 53 % has never been involved in a public information session and 48% never participated in a debate with local communities.

Conclusions

A significant part of the geoscientific community and a large number of institutions understands the importance of communication. Expressive endeavours are being done everywhere and for institutions like museums, protected areas or Geoparks, communication with lay audiences is indeed a priority and it is used as a strategy for Geoconservation. These preliminary results about geoscientist's perceptions and practices, show that geoscientists are motivated and they fell comfortable and prepared to communicate. However, lectures and scientific papers are among the most frequent practices and 67% rarely or never participated in public debate or public information session. These results show that, despite the perceived confidence about their skills and competences to communicate, geoscientists are still very focused on unidirectional models and in communicating with their peers. Public engagement with Geodiversity demands new solutions and a change of paradigm in Geoscience Communication, where lay public is not seen as a single entity with knowledge deficit. To put these issues in the public agenda, communication strategies need to be targeted, with different approaches to engage with communities, local stakeholders, media, students and teachers, scientific community, tourists, politicians or policy-makers, groups with different concerns and distinct relations with science. Broad scope and multidimensional impact of Geodiversity in society compel non-experts to integrate their knowledge in public participation and decision-making.

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