Becoming, Being, and Sometimes Leaving: A Longitudinal Ethnographic Perspective of Climate Scientists' Participation in Science and Education

Elizabeth M. Walsh, San José State University, elizabeth.walsh@sjsu.edu

Abstract: The learning of socio-scientific knowledge and practices in and out of school is facilitated by the participation of working scientists. In 2016, I interviewed 18 key informant climate scientists from a longitudinal ethnographic study initially conducted in 2009-2012, to examine how their participation in education and communication had evolved over time. Findings indicate that scientists' science and SEC identities were intertwined. Further, science and SEC trajectories were shaped by an increasingly polarized social context, as well as scientific structures that limited stability and at times misaligned with scientists' values.

Introduction

The participation of scientists in science education and communication (SEC) can provide current and detailed expertise in scientific content, practices and processes, as well as entry points for learners into scientific communities. Working in a societally relevant field, climate scientists in particular often have high levels of interest in increasing public engagement with climate science (Bowman et al., 2010). Currently there are limited accounts of the experiences, motivations and perspectives of those scientists who do choose to participate in communication and education, and what supports or hinders these activities. Detailed understandings of climate scientists' trajectories of learning and participation in science education and communication practices is needed, to better support ongoing participation in SEC. This poster presents findings from a five-year longitudinal follow-up to an ethnographic study and examines how scientists navigated scientific and educational identities and structures over time, and what informed the sustainability of their participation in SEC and in science itself.

Methodology

Theoretical framework

As a cultural group, the scientific community is associated with particular modes of participation in epistemic practices (Latour & Woolgar, 1987). Because the ultimate purpose of socially relevant sciences, such as climate change, is often its use by those outside of the scientific community, climate scientists are often called on or choose to act as participants whose pathways crossed boundaries between science and SEC communities. This analysis draws on Nasir & Hand (2008)'s construct of practice-linked identity to examine science and SEC-linked identity through participation in contexts over time. I examine scientists' roles over time, and how available resources, structures, values and practices shaped scientists' SEC work.

Data sources and analysis

Between 2009-2011, I conducted a longitudinal ethnography of climate scientists involved in informal outreach and K-12 education activities. In Fall 2016, follow-up interviews (semi-structured, 45-60 minutes, audio- or video-recorded) were conducted virtually with 18 key informants from the initial study, focusing on views of and experiences with science learning, education and communication, and their activities related to education and communication during the last five years. Participants also completed an online survey about their participation in SEC. I qualitatively coded transcriptions of interviews using a combination of a coding structure developed during the initial study (Walsh, 2012) and emergent coding (Lofland & Lofland, 2006). Emergent themes were explicated iteratively using memoranda, and I reviewed and analyzed the data corpus to generate and test assertions as described by Erickson (1986). Data from this round of interviews were triangulated with data from the 2009-2011 study.

Major findings

Trajectories in and out of SEC tied to science identity, career trajectory

SEC activities of the scientists were shaped by the career pathway that they took, and these career pathways in turn were shaped by available job prospects, career aspirations, geographic location of available positions and family responsibilities. All participants reported a trend to increasing specialization in a particular kind of SEC

over time, often related to their jobs. David and Kurt, both research scientists, reported an increase in work with the media, while Jason, Jennifer and Clara, who had all recently started or were about to start jobs as professors, became much more focused on their own teaching. From 2009 to 2016, there was an increase in critique of the structure of the scientific community and how science communication efforts are inadequately or inauthentically integrated into science. Some scientists who had left or were considering leaving academia connected this to a critique of how scientific jobs are structured. Kat described an "identity crisis": her struggle to find a permanent position as a scientist had affected her science identity to such an extent that she was no longer certain whether or not she should be encouraging others to pursue science as a career. Several scientists noted that their job structure did not provide room for job security or the possibility for participation in valued activities such as SEC or family life; two scientists had left or were considering leaving science as a career for these reasons.

Increasing social and political polarization and media influence

Most scientists indicated that they believed that the social context for climate change had become more polarized since their initial interviews, and many stated that this had a dampening impact on their communication activities and had shaped their SEC engagement. Since 2011, participants had become increasingly involved in communication with the media, while at the same time becoming critical of the media and its coverage of climate change, especially the proliferation of social media. For example, after graduate student Scott's first scientific paper was picked up by the media and became the target of climate deniers, he considered leaving science altogether and took a leave of absence from school. Scientists reported that they had in many cases reached their limit of trying to communicate directly with the general public outside of working with the media, in large part because of the polarization. They reported that the polarization resulted in, as several scientists stated, "preaching to the choir" when speaking to liberals, or in no impact when speaking with people who did not think climate change was happening. Grant, a professor, described his outlook as much less open to listening to or addressing climate skeptics, stating: "I'm a lot less likely to accept crap about climate change now than I was ten years ago, you know. We've been through all that." Scientists also noted a concern about the tendency to highlight the latest finding instead of contextualizing findings. The need for constant information, "flashy," "novel" findings and statistics was mirrored in concerns about the rise of social media.

Conclusions and significance

Since 2011, scientists who had started motivated and interested in education and communication had generally remained active in SEC. Scientists' modes of participation were deeply intertwined with their identity as a scientist in ways that both encouraged and at times provided a barrier to participation, and led to increased specialization over time. While supports for scientists tend to be geared toward a "general" audience, this work elucidates the dynamic nature of scientist's science communication and education experience. Previous research has described scientists as "unwilling" and "reluctant" to take part in media communication efforts, an effort they have "undervalued" in comparison to their other "professional duties and responsibilities" (Boykoff, 2011 p. 71-73). However, for participants in this study, it was not a lack of interest or reluctance on the part of the scientists to engage in SEC, but a consequence of the politically polarized social context and the structure of scientific and academic institutions. These structures threatened SEC activities, as well as other values highly important to the scientists including job stability, interdisciplinarity, and balance with family life. Some of the younger scientists expressed disillusionment or lack of motivation and others had sacrificed communities or activities that they had previously highly valued, such as SEC or even science itself. This has implications for the STEM education and learning sciences community, as we need to critically examine the institution we are preparing youth to enter and the consequences of choosing a trajectory of participation in that community.

References

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