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CONNECTING SCIENCE COMMUNICATION RESEARCH AND PRACTICE: CHALLENGES AND WAYS FORWARD

Bridging research and practice: insights from collaborative science communication research on Japanese television

Taichi Masu and Yasuhito Abe

Abstract

This collaborative essay details the reflections of a science communication practitioner and a media communication scholar on their joint research into science communication through Japanese commercial terrestrial television. It emphasizes their unique perspectives as an insider and outsider in their respective fields, suggesting a method to strengthen the collaboration between academic research and its practical application in science communication.

Keywords

Public understanding of science and technology; Representations of science and technology; Science and media

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This essay arose from many conversations about joint research on science communication through Japanese commercial terrestrial television, taking place between Taichi Masu, who is a science communication practitioner cum scholar, and Yasuhito Abe, a scholar in media and communication studies in Japan. The former has spent 17 years as a media practitioner at a Japanese commercial terrestrial television agency, actively involved in science communication practice. Even after transitioning from the television agency to academia in 2022, he continues to convey an array of scientific information to a wide audience, all while maintaining his dual role as a science communication practitioner and researcher. On the other hand, the latter has devoted years to the study of citizen science as science communication by citizens, a model where citizens are at the forefront of science communication [e.g. Abe, 2014, 2020, 2022, 2023a, 2023b]. As a social scientist, he has examined how a variety of citizens were engaged in measuring environmental radiation after the Fukushima Daiichi nuclear disaster of 2011, illuminating how they used various media, including digital media in particular, to disseminate the scientific information and knowledge they acquired to a larger audience within the contemporary Japanese media landscape [e.g. Abe, 2015, 2019].

In this essay, we will explore the following question: What insights have we gained from one another during our collaborative research? To do so, we begin by

outlining our joint research on science communication via Japanese commercial terrestrial television. We then touch upon its relevance in both social and academic contexts. Following this, we reflect on our method in studying science communication, emphasizing how it seeks to connect research with practical application in this field. While our joint research is still in progress and its outcomes are not the focus of this essay, a detailed examination of the mutual learning between a science communication practitioner and a media communication researcher within this collaborative effort has the potential to enhance the field of science communication.

Overview of our collaborative research

In our joint research, we investigate how a Japanese terrestrial commercial broadcasting agency manufactured television programs relating to a scientific term. In doing so, we focus on exploring the interaction between experts and media professionals. This section will provide a more detailed description of our joint research project. However, before delving into the specifics, we feel it is necessary to introduce ourselves more thoroughly, highlighting our individual experiences and areas of expertise that have influenced our viewpoints on this subject.

Taichi Masu, a science communication practitioner cum scholar, earned a Master's degree in Agriculture, subsequently co-publishing his master's thesis with his academic colleagues [Masu et al., 2008]. After receiving the degree, he started his professional career at the Nippon Television Network Corporation (hereinafter referred to as NTV) in 2006, a key broadcasting agency in Tokyo's commercial broadcast television networks and the oldest private television station in Japan, known for its educational and entertaining programs about science, such as "The Most Useful School in the World" [e.g. Masuda, 2007]. At NTV, his contributions to the realm of science communication extend beyond his sixteen years of active participation in the production of a range of science-related programs at the television agency; Masu also played an integral role in delivering scientific information to audiences in his capacity as a broadcaster [e.g. Chishiki no Hōko Me ga Ten Raiburarī, 2015]. Since his departure from the broadcasting agency in 2022, he has assumed the role of a researcher in science communication while concurrently maintaining his role as a weekly news program anchor [Masu, 2022; Nittere, 2024]. In this capacity, he consistently delivers information pertaining to science, such as the topic of blue carbon, to his audiences [e.g. Nittere News, 2023].

On the other hand, Yasuhito Abe, a media and communication scholar, lacks a direct background in the natural sciences. Instead, his academic path in the field of communication led him to focus on media communication, utilizing qualitative research methods such as ethnography, content analysis, and discourse analysis [e.g. Abe, 2013, 2015, 2019, 2023b]. While Abe does not have first-hand experience in the practice of science communication within a mass media environment, he has been examining how scientific information is produced and represented across different media platforms, including both mass media and digital media [e.g. Abe, 2015]. In the field of media and communication studies, he has been particularly interested in exploring the role of media in science communication by citizens and for citizens.

Given our diverse backgrounds and areas of expertise, we paid attention to NTV's novel media campaign. Commencing in March of 2023, NTV has been

orchestrating a media initiative titled the "Japan Archipelago Blue Carbon Project." In this campaign, NTV has been broadcasting programs related to blue carbon, the carbon stored by marine ecosystems. The official purpose of this project is "to promote activities related to the conservation of the marine environment" [Nippon Television Inc., 2024], but it also includes a media campaign encompassing science communication to popularize "blue carbon," a scientific term currently not widely recognized in Japanese society as of 2023. In this regard, this media campaign lies at the intersection between environmental communication and science communication. As Davis, Fähnrich, Nepote, Riedlinger and Trench [2018] elucidate, environmental communication and science communication share common ground but differ in their primary objective. Environmental communication leans toward raising awareness about environmental concerns rather than the scientific understanding itself, whereas science communication has been less attentive to the matters of awareness-raising or behavior change. In light of Davis et al. [2018]'s observations, our research project has chosen to periodize the elements of science communication because this approach aligns with our shared interest in the field of science communication. Ultimately, we frame NTV's Japan Archipelago Blue Carbon Project as a media-led science communication campaign and focus on exploring how programs relating to blue carbon were developed through interactions between experts and media professionals.

In this section, we provide a succinct summary of our collaborative research that examines the communication between scientists and media professionals involved in the Japan Archipelago Blue Carbon Project at NTV. Before delving into our research method, the upcoming section provides a backdrop for our joint investigation, emphasizing its importance in both academic and societal contexts.

Why our joint research matters

This section provides a brief explanation of the academic and social significance of our joint research on science communication campaign by NTV. While numerous scholars increasingly highlighted the rise of science communication through digital platforms, including but not limited to YouTube [e.g. Brossard, 2013; Velho & Barata, 2020], it is imperative to pay attention to the continued salience of mass media in science communication [e.g. Blöbaum, Scheu, Summ & Volpers, 2012; Bucchi, 1998; Dahlstrom, 2014; Nisbet & Scheufele, 2009; Peters, 2013]. This concern gains particular resonance in the context of Japan [e.g. Hayaoka & Fujikawa, 2010]. Recent empirical evidence indicates that while Japan demonstrates a broader spectrum of interest in science and technology relative to the member nations of the European Union (EU), the level of understanding of science and technology in Japan is somewhat lower than in the EU member states [Hosotsubo, Kano & Okamura, 2017]. Consequently, there emerges a compelling need to reflect critically on the channels used to distribute different types of scientific information to various audiences. Hayakawa [2015] pointed out that although the Internet is becoming a more prominent source for science and technology information, television still remains the key source of scientific information for people in Japan, even for those with scant knowledge or interest in these fields.

To date, numerous communication studies scholars investigated the role of television in scientific information [e.g. Dudo et al., 2011; Gerbner, 1987; LaFollette, 1982; Russell, 2009]. In a seminal piece on science communication on television, for example, Gerbner [1987] characterized the function of television as follows:

> Unlike other media, television is used relatively nonselectively…It provides an abundance of information, mostly through entertainment, to all viewers, including those who seek no information. Television reaches the previously unreachable quickly and continuously. To attract and sell to the largest audience at the least cost to the advertiser (the source of broadcaster income), television must cultivate the most common interests, hopes, and fears of the largest groups of viewers. These imperatives define television's role in society, guide its functions, and shape its contributions to public conceptions of science. [1987, p. 111]

Nearly 40 years ago, Gerbner [1987] thus insightfully pinpointed the unique characteristic of commercial television within the sphere of science communication: its capability to disseminate scientific information, reaching even those not proactively in pursuit of such knowledge. In doing so, he highlighted the imperative for scientists to recognize television's potential for reaching diverse and vast audiences and the necessity of fostering robust relationships with television professionals. Despite Gerbner [1987]'s assertion emphasizing the necessity of cultivating relationships and enhancing mutual comprehension between scientists and media professionals, it remains a challenge to confirm that such ties have been adequately fortified in Japan.

We posit that one crucial factor in fostering mutual understanding is the necessity for both parties to gain knowledge of each other's respective professional cultures, just as Peters [1995] aptly pointed out. Put differently, it is incumbent upon scientists and television workers to strive for a deeper understanding of one another. This implies that scientists need to understand the logic that television workers apply, just as media workers need to comprehend scientists' reasoning. However, there has been a lack of research on the production sites of commercial television agencies in the field of media and communication studies in Japan [e.g. Matsui, 2020], despite that much research has investigated the production sites of television outside the country [e.g. J. H. Caldwell, 2008; J. T. Caldwell, 1995; Gans, 2004; O'Brien, 2015]. In the field of science communication as well, little has been known about the mechanism by which television professionals craft science-related news and content in commercial television programs in Japan. For example, Muramatsu and Inoue [2005] draw upon their experience in producing science programs for NHK (Japan's public broadcaster) and discuss the intricacies of presenting scientific information through television. However, they seemingly bypass a comprehensive analysis of pressing issues endemic to commercial television entities, most notably, the viewership ratings. As Gerbner [1987] suggested, for Japanese commercial broadcasters to increase their viewership, they need to develop programs that appeal to a large audience, including those who may not have a strong interest in science. Nevertheless, no empirical research has been conducted on the communication between media workers and scientists (or experts) in the production of such programs in Japan.

In order to fill this gap in the research, we focus on the NTV's media campaign simply because we are afforded access to the production processes behind science-related television programming, a privilege facilitated through the extensive network cultivated by Masu. Furthermore, it is noteworthy that NTV, operating within the sphere of commercial broadcasting, faces the imperative of viewership ratings, which inevitably shapes its approach to producing scientific

content. Apparently, this contrasts sharply with the production dynamics of public broadcasting entities such as NHK. Consequently, by centering our attention on NTV, a non-public broadcasting entity, we are able to shed light on the tactics employed by media professionals to craft science-centric content, even when operating under the confines of viewership metrics.

Reflecting on the dual insider/outsider method

In this section, we outline our approach to studying science communication through NTV. We adopted team ethnography for practical reasons [e.g. Creese & Blackledge, 2012; Erickson & Stull, 1998; O'Reilly, 2009]. Notably, certain qualitative researchers have posited that conducting ethnographic studies within one's own professional environment could introduce bias, as exemplified by Creswell & Báez's [2021] assertion that such research sites might foster "predetermined expectations of what you will find" [2021, p. 21]. While such concerns can be legitimate, they appear to have been mitigated by the involvement of Abe, who is a media and communication scholar. As a complete outsider to NTV and devoid of experience in the specialized field of science communication within the context of television broadcasting, Abe brought a unique perspective to the ethnographic research design, even influencing the preliminary stages of interview question formulation. Ultimately, our team is more or less egalitarian simply because we acknowledge the multitude of insights that none of us could have uncovered individually.

Over time, what emerged was a realization that this very lack of familiarity with the intricacies of Japanese television station culture constituted a form of "expertise" within the ambit of this collaborative inquiry. It was a manifestation of the old adage that sometimes ignorance can indeed be a form of strength. It must be acknowledged, of course, that the feasibility of this approach was greatly facilitated by Masu's unqualified acceptance of Abe's ostensibly naive inquiries, which in turn enriched the depth and texture of the research. However, the maxim "ignorance is power" does not hold water when it comes to the conduct of expert interviews — without a rudimentary grasp of scientific principles, the specialized language employed by experts can become inaccessible. Abe, having only managed to glean a superficial understanding of the concept of "blue carbon" through layperson-oriented texts [e.g. Hori & Kuwae, 2017], bound himself entirely reliant on Masu, who is a science communication practitioner cum scholar, when the discourse ventured into more complex territories. In contrast, with his deep understanding of key scientific concepts, Masu found it easier to comprehend complex topics. As an adept practitioner in science communication, Masu skillfully simplified and explained intricate scientific mechanisms in a manner that was accessible, which greatly assisted Abe. This expertise was especially valuable during scientist interviews, where Masu's knowledge led to a more fluid and productive data-gathering process.

Through these experiences, we came to understand that our research approach reflects the distinctive viewpoints of two individuals who simultaneously act as insiders and outsiders in their individual areas of expertise. This approach, which we term the dual insider/outsider method, is applied to the study of science communication. We believe that this method has the potential to effectively connect the domains of science communication research and its practical application.

Integrating the insider's perspective is undoubtedly a strong point in our collaborative research. For example, Masu's background in science communication practice initially did not encompass a research design that would capture the intricacies of television production. But, Abe's insight, coming from an insider's perspective in the field research, played a crucial role in refining the research design. On the other hand, the qualitative research background of Abe is grounded in the belief that researchers should invest significant time in establishing trust with participants to gather data effectively. In contrast, Masu's insights, derived from their inside experience in TV program production, have accelerated our research process. In commercial television production, it's crucial to interview everyone involved as soon as possible post-broadcast, as they usually move on to different projects. This insider perspective was essential in making our data collection successful.

Perhaps more notably, our collaborative research gained significantly from each co-author being an 'outsider' in the other's field, bringing fresh perspectives and insights. For instance, when interviewing TV workers, Abe asked a basic yet insightful question: "Why do you always need to come up with something new?" The absence of an immediate answer from the interviewees, as well as Masu's similar reaction, highlighted the importance of this outsider viewpoint. It helped uncover elements that might typically be missed by those deeply embedded in the field. Likewise, Masu's approach to selecting research subjects was influenced by his background as an outsider of media and communication research. He suggested focusing on television programs with high viewership ratings and considering the demographic details of their audiences. This approach was based on their potential for broad social influence and reach. This strategy was particularly innovative to Abe, a media and communication researcher accustomed to qualitative methods where the primary focus often begins with program content. Masu's suggestion to target popular programs during prime viewing times, like Saturday nights in Japan, introduced a fresh perspective to the study, exemplifying how combining insider knowledge from different fields can enrich research design.

While Scheufele [2022] observes that science communication researchers have not necessarily produced the insights needed by practitioners, and that science communication practitioners have not necessarily paid sufficient attention to research findings, our joint research project could bridge this divide, potentially serving as a valuable resource for both researchers and practitioners in science communication. For instance, Masu's experience with science communication at NTV has guided us in identifying what aspects of our research are genuinely beneficial for practitioners, a perspective that would have been absent without Masu's involvement. Additionally, with the involvement of Abe, we have been able to document and describe the daily communication practices of science communication practitioners. This documentation process effectively transforms the practitioners' individual tacit knowledge, acquired through experience, into a collective resource for science communication research. Just as Jensen and Gerber [2020] emphasized, our collaborative research on science communication in Japanese commercial television must offer "relevant, accurate, and timely insights that practitioners can use" [2020, p. 4] in Japan. To fulfill this objective, we believe that our collaborative effort effectively bridges the gap between the practice and research of science communication.

Through such experiences, we gain deeper self-awareness. For example, Masu, who has conducted interviews with a wide range of people, including scientists, in the field of mass media, found that the interviews in qualitative research methods represented a stark departure from his prior experiences. The objective of the interviews he had conducted thus far was to elicit statements from the interviewees that would resonate with viewers on the television screen, a goal quite different from that of interviews in qualitative research. Consequently, Masu was confronted with the task of "unlearning" the interview skills he had honed through his prior experiences. On the other hand, Abe gradually came to understand why some social scientists, lacking formal training in the natural sciences, readily accept the insights of scientists and citizen science practitioners without critical evaluation. Working with Masu, Abe "unlearned" his approach to studying citizen science communication through qualitative research, becoming convinced of the need for scholars in this field to engage more deeply with scientific studies.

Lévy [1997] once posited the notion of collective intelligence, stating that "no one knows everything, everyone knows something, all knowledge resides in humanity" [1997, p. 20]. This idea could potentially furnish meaningful insights for our investigation into the interplay of science communication and mass media. In essence, it becomes increasingly evident that interdisciplinary collaboration is not merely desirable but essential for a nuanced understanding of the complexities inherent in science communication through mass media. Although such collaboration can take many forms, this essay suggests that alliances between science communication practitioners and media communication scholars stand as a particularly effective model for productive intellectual engagement.

Conclusion

Our co-authored essay marks a part of the inception of our extended collaborative research project, whose rationale was described in some detail in this essay. There is the intellectual benefit of collaboration between a science communication practitioner and a researcher as a multi-disciplinary team. This collaboration thrives on an understanding that transcends individual strengths and weaknesses and appreciates the collective strength of the team, drawn from the diverse experiences and specialized knowledge of its members.

This essay underscores the necessity to acknowledge the value of science communication practitioners, a value derived not only from their extensive professional experience but also from their continuing, dynamic engagement with television broadcasting. Continuing as a practitioner of science communication on television not only facilitates access to research subjects such as media workers at TV stations and program production sites, but also ensures ongoing familiarity with the rapidly changing culture of television agencies. Of course, as Creswell and Báez [2021] pointed out, this may sometimes be a hindrance in conducting qualitative research. However, it seems that such issues can be somewhat alleviated by conducting team ethnography with an outsider.

Working alongside media professionals or those intimately familiar with the "logic" of commercial television affords a wealth of learning prospects for scholars in the field of science and media communication. Similarly, science communication practitioners stand to gain substantially from the insights offered by experts immersed in the academic framework of media communication. Consequently, it is

our ardent aspiration that this form of interdisciplinary collaborative research will not remain confined to Japan but will garner recognition and find footing on a global scale.

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