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Using the Four-Frame Leadership Approach to Mobilize Strategic Science Communication Efforts[1]

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Your agricultural and natural resources (ANR) organization most likely has several members working in various roles to engage stakeholders and audiences with science-based information. In this publication, we view an organizational structure as the larger unit, such as the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS). We see a group as a center, department, or county office within that organization, such as the UF/IFAS Center for Aquatic and Invasive Plants (UF/IFAS CAIP), the Nature Coast Biological Station (NCBS), or the UF/IFAS Extension Alachua County office. This Ask IFAS publication outlines organizational details that you should consider when mobilizing science communication efforts in your group.

Most Americans use general news media and the internet to seek scientific information (Funk et al., 2017). Many Americans also view social media, specialty media (documentaries), and museums as credible sources (Funk et al., 2017). Audiences' affinity for specialty sources, general news, the internet, and other digital technology creates a need for experts to participate in communication efforts outside of the traditional academic space (Brossard, 2013; Iyengar & Massey, 2019). Therefore, it is imperative that science organizations work effectively to develop and deliver quality communication and education content that audiences find credible and can trust.

Effective science communication is complex and ever-changing as our digital landscape evolves and society grows (Brossard, 2013; NASEM, 2017). Science communication is "the use of appropriate skills, media, activities, and dialogue to produce one or more of the following responses to scientific information: awareness, enjoyment, interest, opinion-forming, and understanding" (Burns et al., 2003, p. 191). Science communication efforts can be inspired by a personal interest in engagement and outreach or a sense of civic duty to move a policy or political agenda forward (Besley, 2020). Regardless of the motivation to participate in science communication, there are ways for ANR groups to optimize their public engagement efforts through organizational strategy. Organizational strategies can present practical answers to many of the challenges often associated with science communication, including inadequate identification of communication goals and objectives (Besley, 2020). An additional barrier is when an organization lacks access to science communication experts to effectively support their engagement and outreach efforts.

This publication outlines some organizational strategies to consider when participating in science communication through the lens of Bolman and Deal's (2017) four-frame leadership approach. The four frames, which include (1) structural, (2) human resources, (3) symbolic, and (4) political, serve as a roadmap that can be applied to address different elements of engaging in effective science

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communication. As a resource, the four frames provide leaders a unique perspective on communicating science and an opportunity to engage their group members with essential elements of the process. In the following subsections, we outline how you can implement each of the four frames to foster effective science communication strategy and techniques within your organization.

Structural Frame

Building a science communication strategy through the structural frame includes defining goals, roles, and formal relationships between group members. Besley (2020) identified that an inadequate understanding of communication goals, objectives, and tactics were challenges when it came to strategic science communication efforts. Designing a structure that works requires an understanding of your group's function, when work is done (time), what information is being produced (product), who your information is for (stakeholder/priority audience), where the work is conducted (place), and how those pieces need to flow to get the information out (process) (Bolman & Deal, 2017).

Ask yourself: *What are my communication goals for my audience? Who will guide our communication efforts?*

- **Identify your priority audience and their needs.** The first step to starting a science communication strategy is to define your audience. You can start identifying your priority audience by answering the following questions: *Who is your information for? What do they need?* Your priority audience may be professionals who use your scientific findings in their careers, or community members who value the information for their daily lives. After you have defined your audience, you must consider their communication needs and preferences. Stofer (2022b) suggested engaging in conversations through active listening and needs assessments to get started. A needs assessment could include casual conversations at events or conferences, online interviews, or collaborating with social scientists to formally conduct a needs assessment.
- **Define your communication goal(s) and objectives.** After you identify your audience and begin to understand their needs, you can define your communication goals. *Do you want to change behavior? Do you want to shape local, state, or national policy? Do you want to illuminate interest in your area of research?* Besley (2020) described the importance of intentional and specific objectives that help achieve your goals. For example, if you would like to change behavior, how will you measure that change? If you would like to shape policy, which message will resonate with a group of political leaders? If you are striving to illuminate interest in an area of research, what community groups would be receptive to your information? Effective goals should be Strategic, Measurable, Achievable, Relevant, and Timely (SMART) (Diehl & Galindo-Gonzalez, 2019). SMART is a strategy often used in organizations for setting goals with measurable outcomes (Doran, 1981).
- **Choose your channels.** This would include picking the best platform to send out information. Communication channels can vary, from YouTube videos to face-to-face interactions to a podcast, blog, news pitch, or social media campaign. Some groups work within a larger organization and the formal structure and communication policies should be addressed. For example, a research group that works for UF/IFAS can collaborate with their communications office for guidance on branding and messaging. Choosing the most appropriate communication channel for your content is how you will begin to meet your audience's needs and achieve your communication goals.
- **Determine formal roles and responsibilities.** Once your audience and goals are defined, you should consider identifying the roles and responsibilities of your group members. Drawing the formal structure of your group can help with visualizing roles and the way in which information moves. This allows you to understand the composition of your organization and decide what new roles or partnerships need to emerge to mobilize your communication goals. For example, you could hire a designated science communication professional who creates content for your audience. By designating roles, there is more structure and accountability.
- **Orient the group regularly.** Science communication relies on diverse perspectives and interconnectedness (NASEM, 2017). By hosting regular meetings, you can inform everyone of upcoming projects, share current progress, and celebrate achievements. These meetings can remind group members of the work being conducted within the group and communicated to priority audiences. It is important to determine how these meetings should be structured. Communicating science can be one agenda item in the group's overall weekly meetings, or it can be a standalone meeting. While both options have benefits, it is important to determine the goal of the communication and the structure for achieving the goal.

Human Resource Frame

Organizations are made up of a collection of individuals who come together for a variety of reasons or motivations. Through the human resource frame, Bolman and Deal

(2017) described how personal and interpersonal dynamics can make or break your group's success. This frame is used in situations that require relationship building and addressing personal and professional development of employees. When individual needs are met, then both the individual and organization succeed.

Ask yourself: *What are the needs of each group member?What are the individual motivations for participating in science communication?*

- **Recognize individual motivations.** Acquaint yourself with each group member's background, professional interests, and hobbies. This information will allow you to connect with your colleagues and identify skills offered by individual group members to enhance communication efforts. For example, someone may enjoy photography as a hobby, and another person may be fluent in a second language that is relevant to your stakeholders. Gain insight into why each member believes it is important to communicate science for a better understanding of their individual motivations.
- **Participate in professional development opportunities.** Training is essential to develop a skilled and motivated group. One option is attending conferences and workshops related to science communication, education, and engagement. Alternatively, Stofer (2022c) recommended participating in a science engagement event outside of your discipline "to experience some of the anxiety, confusion, or initial disconnection your audience might be feeling" when they engage with your information. Communication and platforms for successful communication change rapidly, so a continual learning philosophy will encourage all group members to develop the skills necessary to be successful.

Symbolic Frame

Bolman and Deal (2017) described the symbolic frame as your group's values, rituals, missions, and practices. This frame is relevant in situations of change to create a shared vision, foster creativity, and inspire purpose. Through activities and meaning making you can cultivate a coordinated group of individuals aligned with a purpose, ultimately leading to clear and creative communication efforts.

Ask yourself: *How can we foster relationships through science communication efforts?*

- **Establish a clear mission, vision, and values.** By establishing a clear mission, vision, and values, you foster both a positive working environment (Farnsworth et al., 2020) and a successful, value-centered group. A mission statement describes what your organization does and reflects the values that your group agrees to respect. A vision statement communicates where you see your organization in the future. A science communication mission and vision should reflect your group's research agenda and your priority audience's needs. Having defined values is also critically important. These values set the foundation for behaviors that are most important to the group. Values established within a group make it easier to hold individuals accountable, to celebrate appropriate behaviors, and to increase the likelihood those behaviors will happen more often in the future.
- **Consider communication tactics that align with your mission and vision.** It is important to align your communication tactics with your mission, vision, and values because they help you achieve your goals. Communication tactics are the message and activities you use to accomplish your goals and objectives. Depending on the communication tactics you choose, you can foster relationships with your priority audience. Some specific tactics include posting blogs on LinkedIn to engage with a professional audience, signing up to host a virtual field trip to connect experts with K–12 students, or collaborating with a professional communicator to craft printable materials for a community event.
- **Celebrate science communication success.** It is critical to celebrate and reward science communication success. If you have been able to achieve the goals set out in the structural frame, celebrating these accomplishments can build individual motivation and develop a group culture that prioritizes communicating science.

Political Frame

The political frame relates to the power dynamics and influence of resources (Bolman & Deal, 2017). This frame is useful in situations where there are competing interests or scarce resources. Navigating the politics associated with your group can be intimidating. It is suggested that networking, bargaining, and negotiation can lead to sharing of power and resources. These skills can help mobilize communication efforts in your group.

Ask yourself: *Who around me has power and expertise in science communication? What resources exist within my network?*

- **Familiarize yourself with existing resources within your organization.** As a leader, it is your role to navigate the political landscape to ensure the success of your

group. If communicating science is a critical element of your group's success, it is important that you draw on available resources to accomplish this. There are several resources that you can access to be successful. Consider communication professionals and resources within your organization. Additionally, by working with other individuals outside your group who have experience and/or expertise in communication, education, and outreach, you can increase your science communication effectiveness. Identifying resources such as grants, internal communication services, and workshops can help you bolster communication efforts. For example, UF/IFAS has a designated communications office that provides a range of resources and services to support departments, research centers, and Extension offices.

- **Remember that your audience is your greatest resource.** Your audience is essential in informing your science communication strategy. Build an advisory council that represents your audience or reach out to specific individuals for feedback to set your communication strategy up for success. By including different stakeholders in the process, you are more likely to gain access to their expertise and resources. Additionally, those who participate in the process are more connected to the success of a project.

Summary

Science communication can happen through a variety of platforms or programs. Americans seek scientific information through a variety of communication media (Funk et al., 2017). Science organizations and groups must consider what communication strategy is appropriate for the work that they do. Mobilizing strategic science communication efforts can be a daunting task. Thinking about your approach through the four leadership frames (structural, human resources, symbolic, and political) can help guide your planning and implementation. Effective science communication takes a considerable amount of time and resources. By incorporating the four leadership frames, you can optimize efforts within your group.

Additional Resources

Below are some more Ask IFAS resources crafted to provide science communication and engagement expertise.

Getting Engaged Series

This series is dedicated to helping you become more comfortable with stakeholder engagement.

"Getting Engaged: 'Public,' Stakeholder, and Community Engagement Practices for Researchers"

"Getting Engaged: Improving Your Stakeholder Engagement Practices"

"Getting Engaged: Resources to Support Community Engagement Practices"

Streaming Science Series

Each article in this series highlights different mobile technologies and approaches that you can use to engage with intended audiences.

"Streaming Science #1: An Introduction to Using Mobile Technologies for Engagement with Your Target Audience"

"Streaming Science #2: Using Webcast Electronic Field Trips for Engagement with Your Target Audience"

"Streaming Science #3: Using Scientist Online Electronic Field Trips for Engagement with Your Target Audience"

"Streaming Science #4: Using Podcasts for Engagement with Your Target Audience"

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