

Collaborative Science Narratives: Faculty Experiences Working with Budding Agricultural Communicators in a Project-Based Learning Course

Karen J. Cannon, Cal Poly, San Luis Obispo & Jamie Loizzo, University of Florida

Introduction, Conceptual Framework & Background for the Study

As the agricultural communication discipline grows, it benefits from evaluating and updating curriculum and teaching approaches (Leal, et al., 2019; Corder & Irlbeck, 2018; Doerfert & Miller, 2006; Irani & Doerfert, 2014). Research indicates budding agricultural communicators should work with scientists to develop projects and messages about critical agricultural and natural resources issues as they learn to become professional communicators (Loizzo et al., 2018).

Experiential learning, specifically Project-Based Learning (PjBL; Bell, 2010), provides opportunities to facilitate innovative learning experiences teaching students a variety of skills from both communication and science disciplines. Often PjBL projects focus on issues in science and society, and help students drive their own learning through inquiry and collaboration with their peers to create real-world projects. The purpose of this research was to understand faculty collaborator experiences in working with students in a digital science communication course, which is situated under the AAAE NRA RPA 4 – Meaningful, Engaged Learning in All Environments.

Cal Poly, San Luis Obispo's bachelors of science in agricultural communication program began in 2012. Since that time, the program and its enrollment have grown. In line with the literature supporting review and updating of curriculum, this research project centered on a new course developed for the program (AGC) focused on providing students a PjBL-based course focused on communicating agricultural science topics through digital multimedia projects. Projects in this course were published on StreamingScience.com and are the first in a partnership established between the University of Florida and Cal Poly, San Luis Obispo's programs.

Student teams were paired with faculty in the College of Agriculture, Food and Environmental Sciences to create their projects with the intent to educate online audiences about faculty scientific research. Directions for students on the projects' structure were purposefully left broad to allow for student voice and choice (Loizzo, et al., 2018).

Methodology

This study sought to understand faculty experiences working with students in the course. Semi-structured interviews were conducted by the lead investigator via Zoom with faculty scientists who partnered with students during the course. Interviews focused on three areas regarding the scientists' experiences: working with student science communicators, perceptions of the student project process, and perceptions of the project outcomes. The project was approved by Cal Poly's Institutional Review Board. Interviews were recorded and transcripts provided by Zoom; transcripts were checked for accuracy by the lead investigator.

The researchers individually open-coded interview transcripts for emergent categories and subsequently discussed these to identify themes per Saldaña's (2016) methodological procedures. The team conducted axial coding and reviewed and coded data to the themed categories, establishing confirmability by coding independently, comparing codes and finally reaching consensus regarding major themes (Hesse-Biber, 2017). Researcher bias is inherent in qualitative research, so the lead researcher took notes and memos to attempt to mitigate this concern, and used member-checking to enhance trustworthiness throughout the interview process (Lincoln & Guba, 1985).

Findings

Seven interviews were conducted, representing all the faculty scientists who participated in the course projects. Five of the seven are international faculty members; that is, they are non-native English-speakers, while the remaining two are native English speakers. Three themes emerged:

Navigating logistics and communication

Participants reported some teams had excellent communicators who handled logistics well and at least one participant had a team particularly challenging in this area:

Anna worked with a very skilled team... "They were really good at communicating with me about scheduling a time, because I have a really crazy schedule. They really respected my time and had really good questions prepared... Students were really good at preparing themselves and they had done the homework to know a little bit about what I'm doing and then from there even without my guidance they went to the lab and the field and took photos. And they did a fantastic job in terms of interacting with me."

Eleanor did as well... "They were organized, they were really easy to communicate with when we had the in-person meetings... It's not like I've been interviewed very much at all but the students handled it really well."

Although she noted issues with logistics and communication... "Timelines were a challenge; we had a lot of back and forth to try and find a time to take the photos and I think in a professional setting they would want to avoid that even if their schedules were completely swamped. I feel like they would want to make it seem like they're ready and they're going to make it work, maybe drop something else and make this happen."

While Francie's experience with her student team was particularly challenging... "Scheduling was a bit hard because I would write them and then I wouldn't get a response for several days... [We] kept having these email chains where I was what is going on, I sent so many emails in between where I wouldn't hear back and then they would be like "I need this right now." So I mean... that was a little, a little strange... [The team members] didn't communicate with each other well."

Francie also observed... "They just haven't had these experiences in terms of saying to someone, here's my time frame. Can we do this, and can we do that, and none of them really had that experience. And yet this team really did not understand that when getting what I would describe as aggressive and then disappearing and aggressive – anticipating that there's implications for their work because of that."

Participants discussed how communication challenges affected their experiences:

Anna commented... "Communication is a challenge for me because English is my second language. Even after being here for a number of years now, it's hard not to translate from my mother tongue to English, and I know there's an accent component to it too. So I'm glad that they captured what I do and overall they got what I wanted to communicate to the public."

Gabe expressed the lack of clarity about expectations in time the team spent with him... "My first impression was that on day one with them we were going to come and talk about what's the plan, and the second day when we met for photos they only had a short period of time. So I think that wasn't enough time. You need to spend quite a bit of time. I would recommend, to do the job properly." **And noted the issues of understanding that emerged...** "It's complicated because when you come from a different [subject] background it's a challenge to understand someone's work. I felt they missed the concepts a bit. If you come and talk to me for 30 minutes you get it but when you try to write up the report probably you need to understand some of the technical terms."

Charlie noted... "I think it's important to have a clear picture of what you want to get out of it. I don't think in their professional lives they're going to be able to rely on the person they're interviewing to provide clarity. And I certainly wasn't prepared to provide that, I didn't know what they needed."

While Eleanor wondered... "Is the goal of the communication material they designed to put science in the spotlight or to really explain a certain research finding that this professor is working on. I think that would be really helpful, and maybe I would have been able to give a little more targeted answers to their questions if I knew where they wanted to take [the project/conversation]."

Scientist-student collaboration sparked science interest and learning

Participants noted some teams demonstrated clear interest in learning about faculty work:

Beth recalled... "When they were interviewing me, I could tell they respected me, and my time and they showed interest. They spent time being interested, being in the greenhouse with me. It showed me they were willing to spend time."

Francie remarked... "They seemed very open to listen and learn about the kind of work I was doing." **Anna observed...** "The students were really good at preparing themselves and they had done the homework to know a little bit about what I'm doing. And from there, even without my guidance they had gone and taken photos in the field."

Eleanor was particularly pleased students she worked with... "Were very well prepared and had done a lot of research about me, which was surprising... They did a really good job of showing enthusiasm and interest and they definitely created an encouraging environment to answer questions... Their impressions seemed to be so cool and they never really thought about it. So I thought that was a really positive outcome. I was pleased to see that somehow I must have conveyed a message that the type of research I'm doing is interesting and sort of exciting."

Several participants discussed their interest in learning and a sense they need to learn to communicate more effectively to non-expert audiences (non-major students):

Eleanor really enjoyed the experience and reflected... "It was fun to talk to students that aren't soil scientists or agricultural sciences... to see the types of things they're learning and how they think about problems, because it's a little different than the way students in my program think about problems... I think I didn't communicate so much about what's really the science behind my research. I think there's great potential [with this class]. It's really important to communicate what any researcher is doing. I don't feel like I really ever do enough of that."

Charlie commented about challenges translating language... "If you're trying to explain it to a group who doesn't know very much about it that's I think what makes it the most challenging. How do you bring it to a level that someone who doesn't know anything about it can understand it... obviously I need help presenting my research to lay people as well."

David noted... "These students didn't have the same science background my students have since they are studying communication... [Communicating ideas to them] was not that easy, though, because I use scientific jargon to communicate a lot. So it was not easy... but it was not so hard because while they are not [my subject] students, they are not students who don't have any knowledge about science."

Beth talked about... "There are sometimes where we need to communicate to non-major/non expert audiences. And for us as researchers we think we have eliminated our jargon, but still maybe we're hard to understand. So it would be good to have some professional help with this, to give us feedback... I don't have much experience talking about my research to lay people."

And Anna noted... "It is hard to explain, in layman's terms, my research. Students struggle, we [as faculty] struggle. We forget that oftentimes we shouldn't use technical terms."

Interestingly, multiple participants mentioned wanting to obtain students' questions before meetings and interviews:

Charlie commented... "I think for me personally it's nice to see the questions you're going to be asked in advance so I can get an idea of what the final product is going to be."

Eleanor also noted... "In an interview, you don't know what the questions are going to be so you kind of answer on the fly, what comes to mind. If the aim was really to communicate core take home messages about my research, I feel like I would have done a better job if I had known the questions and gotten to do some prep."

David added... "If the students are going to ask us questions, it would be helpful to get those a few days before... it would help translate language into laymen's terms so we can address the research in the right way [for the audience]."

Humanizing the scientists, human-ness of scientists

This third theme, while less prevalent among participants' responses was particularly interesting as scientists noted how students engaged them in discussions beyond their areas of expertise:

Eleanor reflected... "They really asked a lot of questions about, that were professional but personal – like you know why I like what I'm doing, or how I got to where I am. You know, these types of questions that don't really require a technical answer... I thought it was kind of interesting and fun that they gave it this kind of human dimension. You know, like not that it has to be about me but that the story of a person who ended up becoming a scientist and what drives them I think could be, you know, inspiring for students that are maybe trying to figure out what they want to do."

Anna's team also focused on her story... "They thought about what kind of story they wanted to tell and had questions kind of chronologically that helped me to tell a story... to take all the pieces I have to tell and make it a story."

Something that also emerged was the human-ness of the scientists as they reflected on their participation in the projects with students:

Beth recalled... "I felt comfortable interacting with them, they were very respectful. There was one time where I forgot to put a meeting on my calendar and the students showed up and I totally forgot. They waited for me a long time but then they handled it well when I showed up to tell them about the mistake. I don't forget things, and that was hard but they were understanding."

David felt uncertain about having video recorded and performing well... "You have to do it multiple times, do multiple takes to get it right and make it the best. The first time isn't the best, but later on I would be better."

Eleanor also discussed her thoughts about being interviewed... "It's not like I've been interviewed very much at all but the students handled it really well. In comparison to the zoom interviews we do for job searches it can be so sterile, but the students did prepare and it didn't feel as robotic as some of the other interview experiences have been, so I think they did a really good job."

Eleanor's passion for participating in future similar projects shined through... "I couldn't help but think that there is just so much potential for your students to contribute to Poly's mission of learn by doing and the teacher scholar model, and to really highlight that because you know we're swamped and we are supposed to disseminate our information to various audiences. But we're not, first of all we're not trained for these different kinds of communication. I feel like the advancement team could probably use this and the people that recruit students could use this."

Conclusions & Recommendations

Participants in this project universally described having overall positive experiences with their collaborators, even faculty who described multiple struggles with their student teams. At a time when the Cal Poly agricultural communication degree program is growing and programs across the country grow, positive results from innovative teaching approaches such as this are encouraging. First, from the perspective of participants in this study project collaborations benefited students in terms of learning important skills in navigating logistics and communication. Participants also noted their pleasure at students' interest in their work, showed an interest in their own learning, and demonstrated the value of sharing stories and personal anecdotes that illustrated their humanity in the final projects.

Several areas for improvement and emphasis in future iterations of the course emerged as a result of faculty participant recommendations, some of which include an increased emphasis on planning, timelines and discussing project expectations with students in the course prior to engaging faculty collaborators, and efforts to improve student understanding of the process of scientific research faculty engage in to improve project outcomes. Faculty scientists who participated in this project generally saw themselves as needing to learn to better communicate their science to public or non-expert audiences and saw possibilities through partnerships such as this to engage in "learn by doing" opportunities for themselves. Across the board, faculty participants were eager to participate in similar projects in the future, in large part due to the multiple benefits for students and themselves.

