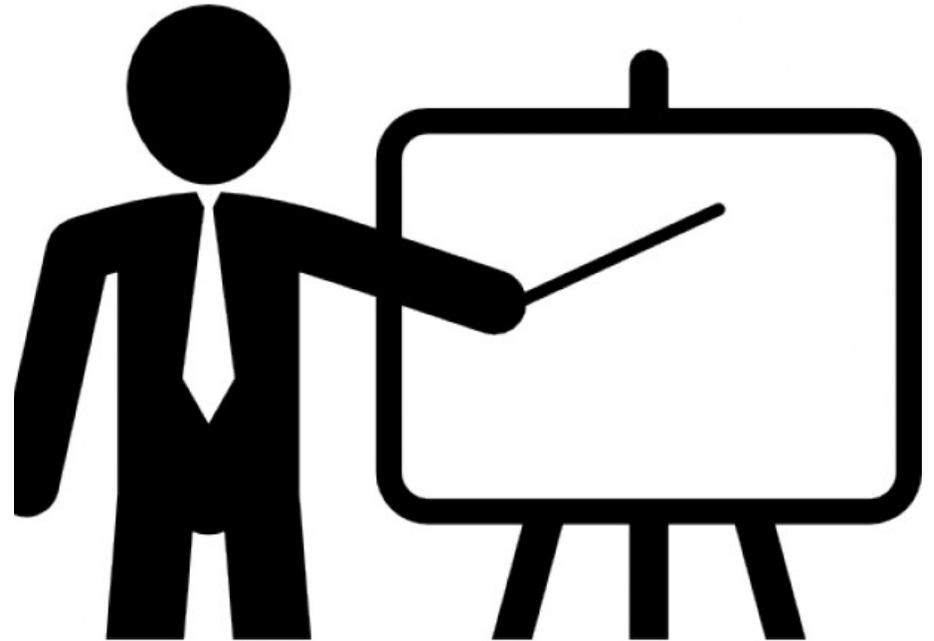


Introduction

- Teaching scientific concepts is the focus of high school agriculture and science teachers' time, effort, and ability, but communication skills are the are the foundation that will lead to change (Morgan, 2012).
- Teaching communication skills can be difficult as these skills require behavior change and, thus, require unique approaches different than teaching basic knowledge and understanding.
- Often, agriculture and science teachers do not have the time, nor the expertise, to prepare instruction to deliver soft skill training to students.



A chalkboard with a lightbulb and chalk drawings of circles and lines. The lightbulb is unlit and sits on the board. There are three circles drawn with chalk, and several short lines. The board is set against a dark, textured background.

Purpose

- To understand how award-winning science and agriculture teachers incorporate communication skills into content.
- To develop a resource consisting of techniques, approaches and tools that teachers can use to incorporate communication skills into their content.

Method



Research Design

- This study aligns with applied research in nature as it aimed to solve a specific problem of a group (Patton, 2002).
- Narrowed to a **transcendental phenomenological inquiry** as it “focused less on the interpretations of the researchers and more on a description of the experiences of participants” (Creswell & Poth, 2018, p. 78).

Method

Population/Sample

- A purposive sample was selected “to permit inquiry into and understanding of a phenomenon in depth” (Patton, 2002, p. 46).
- Creswell and Poth (2018) said in order to adequately explore a phenomenon, a heterogeneous group ranging in size from 3 to 4 individuals to 10 to 15 individuals who have all experienced the phenomenon should be involved.



Method

Procedures

- Established a mutually-convenient time to hold semi-structured one-on-one interviews with each participant.
- The information gathered was reduced into noteworthy statements or quotes, which were categorized into themes (Creswell & Poth, 2018).
- First used open or axial coding (Corbin & Strauss, 2008).
- Implemented a comparative analysis (Corbin & Strauss, 2008).
- Themes were evaluated by two criteria: internal homogeneity and external homogeneity (Patton, 2002).
- Textural descriptions that explain *what* the participants experienced, and structural descriptions which explain *how* they experienced it (Creswell & Poth, 2018).



Theme 1 – Using exploration to enable communication

What

Students are required to explore or research a phenomenon and become “the expert” to then teach others.

How

- Oral and written components
- Identify reliable sources
- Learn not to trust something at face value
- Establish credibility in their work
- Convey themselves as reliable sources of information
- Make claims based on evidence
- Expository writing (i.e. claim, evidence, reason)
- Case studies

Theme 2 – Using marketing to explain effective communication

What

Students use marketing techniques to design a product or sell their idea

How

- Oral and written components
- Understand their target audience and its needs
- Learn to frame a message
- Be able to deliver a message
- Create a sales pitch
- Design an object using 3D printer
- Analyze TV commercials or online advertisements
- Develop a commercial

Theme 3 – Encouraging critical thinking

What

Students are required to clarify, explain and decode information to make informed decisions

How

- Oral and written components
- Problem-solving
- Logical fallacies accompanied with myths
- Practice turning goals into actionable steps
- Reflection
- Inquiry-based activities
- Explain and interpret controversial topics

Theme 4 – Critiquing approaches

What

Students engage in critiquing their peers and/or teacher and recommend changes

How

- Oral and written components
- Demonstrate negatives in presenting
- Offer feedback
- 2:1 ratio
- Address specific areas (i.e. body language, hand position and gestures, eye contact, voice, volume, use of “ums”)
- Make revisions

Theme 5 – Mechanics of communication

What

Students engage in activities to understand the fundamentals of written and oral communication and their effectiveness

How

- Discuss word choice
- Practice shortening sentences
- Readability of directions and how to improve them
- Eliminate “fluff”
- Context clues to interpret word meanings

Theme 6 – Active listening guidance

What

Students learn to be active audience members and to listen effectively to formulate relevant questions

How

- In-depth discussions
- Guest speakers
- Open-ended versus close-ended questions
- Share someone else's opinion accurately
- Practice interviewing
- Write pertinent questions and evaluate

Theme 7 – Visual Literacy

What

Students learn to interpret and gain meaning from images and to use visuals effectively in their work

How

- Oral and written components
- Presentation with only pictures
- Problem-solving with graphs and pictorial representations
- Respond to images using low-inference prompts
- See, think, wonder approach
- Create visual, 3D representation of scientific phenomena

Theme 8 – Role-play

What

Students advocate for the perspective of another person and practice non-verbal communication

How

- Focus on non-verbal cues to guess a person's role
- Opposing views partake in debates
- Practice respecting the views and opinions of others
- Make connections and shows relevance to daily lives

Theme 9 – Online interaction

What

Students understand how online communication differs from face-to-face interaction, and learn how to navigate the online interface and social media

How

- Improve poorly written communication pieces received by teacher (i.e. emails)
- Use examples of what is and what is not appropriate to share on social media
- Discuss copyright material and how to find usage rights
- Learn that emotion can be lost in writing
- Understand permanence of online communication

Theme 10 – Interpersonal training

What

Students build relational abilities and learn to respect the opinions of others without being critical

How

- Controversial topics
- Teach personal story behind scientific idea through a cultural lens to create emotional bridge for students to relate
- Logic is not more important than emotion
- Practice interviewing
- Break down barriers and develop relationships

Conclusions



- All award-winning teachers emphasized that they did not have a communications unit, but that communication skills were incorporated into content
- All approaches documented were implemented in the context of science
- Resulting article will serve as a resource for science and agriculture teachers and add to the body of literature regarding teaching communication skills.

References

- Corbin, J. & Strauss, A. (2008). *Basics of qualitative research*. Thousand Oaks, CA: Sage.
- Creswell, J. W. & Poth, C. N. (2018). *Qualitative inquiry and research design* (4th ed.). Thousand Oaks, CA: Sage.
- Morgan, A. C. (2012). Competencies needed by agricultural communications undergraduates. *Journal of Applied Communications*, 96(2), 17-29. doi: 10.4148/1051-0834.1146
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.