

A Sunburst of Voices: Visually Depicting Analytical Codes from Students' Experiences

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Introduction/Need for Innovation

A picture is worth a thousand words, and an interactive picture may be worth tenfold. Agriculture education researchers must find effective means of communicating qualitative research findings, especially in a world so accessible via Big Data (Kosior, 2017). Data visualizations may be such a means. In addition to communicating qualitative findings, researchers can use data visualizations to render transparency about their analytic processes (Pokorny et al., 2018). Fortunately, user-friendly tools are stimulating the use of data visualizations in social science research (Healy & Moody, 2014). In this case, an interactive radial graphic by NVivo® was used both to analyze and depict axial codes produced from interview transcripts in a mixed methods intervention study about rural middle school students' experiences and student-teacher relationships in career and technical education exposure courses. NVivo® is software that helps users codify, sort, and analyze qualitative data. Users can select the hierarchical chart function of the program to create interactive data visualizations of codes. *Sunburst*, one of the software's visualization options, helped convey the depth, hierarchy, and frequency of categories associated with topics in a multi-level, pie-graph-like format. The researcher used the graphic to connect axial codes to emergent themes and provide a clearer justification for findings induced from the data.

How it Works

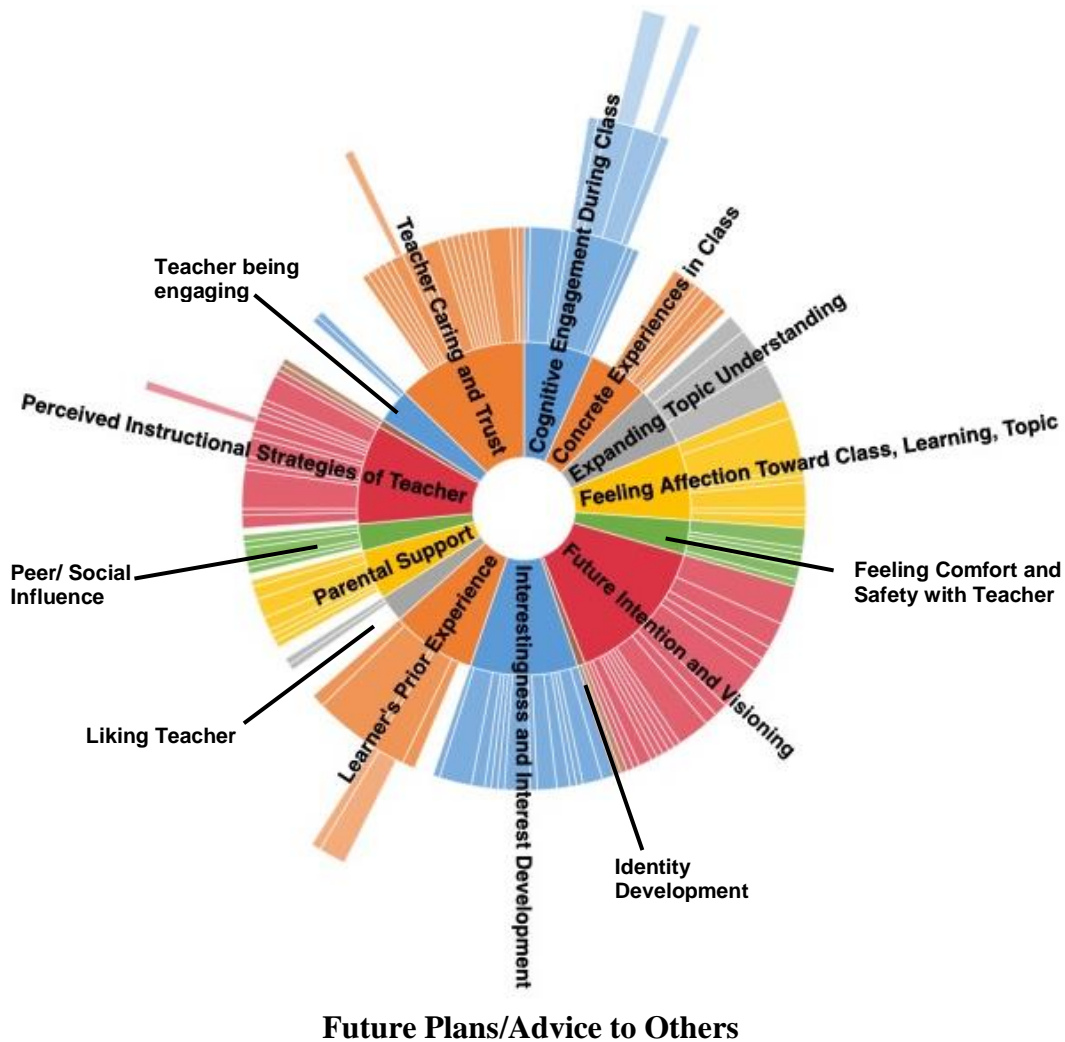
Interview transcripts were initially coded within NVivo® and then grouped to create axial codes. The axial codes, representative of patterns in the data (Merriam & Tisdell, 2016), were structural phrases framed by the theoretical framework (Saladaña, 2013). Structural coding is appropriate to use in hypothesis testing and when multiple participants contribute to the data (Saladaña, 2013). Next, the *sunburst* hierarchy chart feature in NVivo® was selected in *data analysis* with the following visualization settings: *coding for codes*, comparing *all codes*, and coded to *data and memos*. The software produced a radial graphic of axial codes with slices and hierarchical layers. Each slice represented an individual code while each layer represented a level of code categories (head levels with sub-levels). Axial codes were color coded, and initial codes (slices) were grouped together by color. Clicking on single slices of the live radial graphic produced a more detailed view with the selected code in the center of the new graphic encircled by sub-levels of initial codes. The live feature was used to conduct a thematic analysis. Finally, the printable graphic was included in the study's findings to help readers grasp the nature and extent of the structural, axial codes that emerged from students' voices.

Results

Figure 1 displays the printable *sunburst* graphic created in NVivo®. The live and print graphic were used to analyze and communicate findings, respectively, in a mixed methods study on the effects of authentic experiential learning and student-teacher relationships on situational career interest of rural youth. Based on the axial codes represented in the graphic, one theme that emerged was: *An engaging, caring teacher facilitating engaging instructional strategies contributed to the learner's affection toward and interest growth in a CTE topic.*

Figure 1

Structural Axial Codes Produced from Qualitative Data Analysis



The *sunburst* radial graphic in NVivo® has potential as a tool for communicating the hierarchical relationships of codes and other data bits. Future agricultural education researchers can utilize the communicative and analytical potential of NVivo's® *sunburst* feature with a variety of raw qualitative data such as field notes and documents. In addition to being a modality to communicate findings, the visualization can also be used as a tool to analyze data (Healy & Moody, 2017). Interestingly, live graphics challenge the status quo of print publication in scholarship. Tools such as *sunburst* invoke the potential for future scholarly communications to utilize digital interactivity with readers and audiences via publications and presentations.

Costs/Resources Needed

NVivo® software costs \$86 for individual students or just over \$2,500 for a small academic organization.

References

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