Assessing the Longitudinal Impact of a Specialized Youth Training Program

Dr. Gaea Hock
Kansas State University
315 Umberger Hall
Manhattan, KS 66506
785-532-1166
ghock@ksu.edu

Zachary Callaghan
Kansas State University
315 Umberger Hall
Manhattan, KS 66506
785-532-1166
zcallaghan@ksu.edu

Katelyn Pinkston
Kansas State University
315 Umberger Hall
Manhattan, KS 66506
785-532-1166
kbohnen@ksu.edu

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Introduction/Need for Research

The 2016 – 2020 AAAE National Research Agenda Priority Area 7: Addressing Complex Problems includes the question "How can formal and nonformal curriculum in Agriculture and Natural Resources address emerging complex issues?" (Andenoro, Baker, Stedman, Weeks, 2016, p.59). In Kansas, we are keenly aware of the importance of having the right quantity and quality of water. According to the Kansas Department of Commerce, the Ogallala aquifer adds around $7 billion to the economy in Kansas alone (Kansas Department of Commerce, 2013). The Education and Public Outreach Supplement of the Vision specifically states, "Increase awareness and knowledge of Kansas youth on water-related issues through K-12 education and beyond-the-classroom opportunities" (p. 72). This item led to the development of a youth water education conference. Content experts, the Kansas Department of Agriculture, and agricultural education faculty worked together to design this training program. Evaluation of the training was needed to determine future direction and changes to address the complex issue of water quantity and quality in Kansas.

Conceptual Framework

The conceptual framework for this research study involved retention and self-efficacy. Retention is a complex process in which long-term memory enables the learner to "locate, identify, and retrieve" (Sousa, 2017, p. 97) information for later use. The ability to speak in front of others and do so well was assessed in terms of their public speaking self-efficacy. Bandura (1986) theorized four specific experiences that help build an individual's self-efficacy: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (McKim & Velez, 2016).

Purpose and Objectives

The purpose of this research study was to evaluate the impact of a water-focused educational workshop on the knowledge retention and public speaking self-efficacy of students. The objectives of the study were to: 1.) Identify the level of student knowledge on water-related topics and issues, 2.) Identify the public speaking self-efficacy of students attending the conference, and 3.) Examine the retention of knowledge and public speaking self-efficacy after the conference.

Methodology

This study was a one group, pretest-posttest design with multiple follow-up surveys throughout the year. The use of a panel study allows for follow-up with the same subjects over a period of time, but there are several challenges to this design including; awareness of the data collection instruments, dropping out, and differences in motivation of subjects (Gall, Gall, & Borg, 2007). On the other hand, this type of research is suitable for identifying individual changes (Gall, Gall, & Borg, 2007). The knowledge assessment was researcher developed with 15 questions on the pretest and 22 questions on the posttest. It was examined by a panel of experts for content validity. The public speaking self-efficacy assessment was modified from another instrument (Arduini, 2011). It consisted of 20 questions on a Likert-type scale to assess students' perceived public speaking ability.

Eleven high school students attended the Kansas Youth Water Advocates Conference July 12-14, 2017, in Manhattan, Kansas. IRB approval was obtained in order to collect data from the students. The knowledge and self-efficacy assessments were administered before and after the conference. All eleven students completed those instruments. The instruments were then sent out through Qualtrics three more times throughout the year; in October 2017, January 2018, and April 2018. Data was collected from each of these instrument distributions and compared to examine retention of knowledge and public speaking self-efficacy. There was a small number of participants ($N = 11$) who attended the training and the students did not have to complete the follow-up surveys are both major limitations.

Results & Conclusions

Students completed a pre and post assessment during the training conference. Three months after the training, students received a Qualtrics survey which included both the knowledge assessment and public speaking self-efficacy questionnaires, and questions regarding their work as a water advocate. The students reported a mean score of 8.64 (SD = 1.37) on the 15 question pretest. The conference posttest yielded a mean score of 17.27 (SD = 3.17) out of 22 points. The posttest scores for the three follow-up rounds never scored above the conference posttest mean, but it also did not decrease by more than a point for each administration. This is positive in that they did not lose their knowledge on water-related topics during the months following the training. The public speaking self-efficacy pretest yielded a mean score of 4.39 (SD = .31) where the maximum score was a 6.0. The post conference administration yielded a score of 5.18 (SD = .44) which demonstrated an improvement in their confidence to speak in front of audiences. For the next three rounds of data collection, the score remained above a 5.00 which was a good indicator that they were still confident to speak in public, but did not gain substantially in the perceived self-efficacy. The final round did yield the highest mean score (M = 5.60, SD = .19), but there were only two respondents.

We evaluated the change in scores on the two administrations in which all the participants responded. The knowledge assessment showed positive improvements from pre (M = 8.64, SD = .41) to post-conference (M = 12.18, SD = .66) when comparing the same 15 questions asked on both surveys. A paired-samples t-test showed both the knowledge assessment ($t(10) = -9.63$, $p < .01$) and the public speaking self-efficacy assessment ($t(10) = -8.70$, $p < .01$) were statistically significant. Due to the low response rate of the follow-up questionnaires, no further data analysis was conducted.

Implications/Recommendations/Impact on Profession

This was the first year that Kansas offered such a training opportunity for young people. While we had difficulty in getting students to complete the follow-up surveys, we were able to ascertain the impact of the program through the activities students were participating in throughout the year. There are several recommendations for research specifically; assessing participants as to their behavior change, career choice, and affect community decision making. Recommendations for practice include expanding the training program to have more time for knowledge-gain and skill development. Additionally, lessons learned from this training program should be shared with other states working on similar water-related issues. The engagement of youth in these key issues is vital to the sustainability and growth of our agricultural economy.

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