The Affects of 4-H STEM-Focused Project Clubs on Youths' Confidence Towards STEM Topics

Claudia G. Andrade | Montana State University Extension: Lake County 4-H | Ronan, Montana, July 2023

Background

This Action Research Project was facilitated through the Lake County 4-H Extension program to 4-H families

- According to the 2022 Public School Review only 31% of Lake County graduates tested proficient in math and science, and 40% proficient in reading and writing. Montana State averages are 41% and 50% respectively

- Research supports that STEM based initiatives through out-of-school opportunities increase youths' interest and confidence toward STEM topics. (Dhingra, 2019; Feder, Michael A, 2015; Franco & Petal, 2017).

- Youth guardians' express feelings of inadequacy when approaching STEM topics from home.

- 4-H programming provides a diverse range of projects, of which currently, or could be adapted, to include STEM learning initiatives in an out-of-school setting

Research Questions

Purpose Statement:

The purpose of this study is to explore the effects of 4-H STEM focused project clubs as a means of increasing youths' confidence with relation to STEM topics as well as increasing youths' understanding of STEM career opportunities.

Sub-questions:

1. How will the proposed 4-H STEM focused project club affect youths' understanding of 4-H record keeping?
2. How will guardians' perception of 4-H as a STEM enrichment opportunity change as a result of their youths' participation in the respective 4-H STEM focused project club?

Project Design

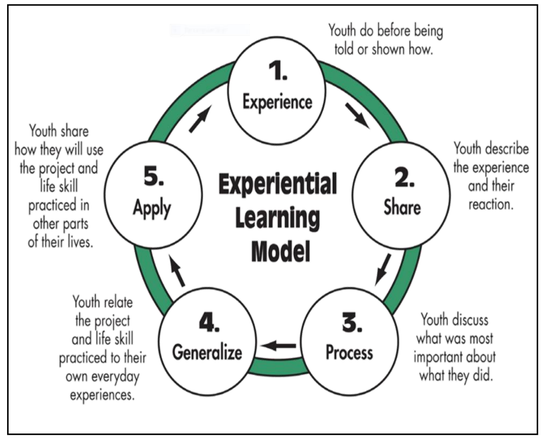


Figure 1. Experiential Learning Model (MSU Extension, n.d.)

Treatment

- Participating Youth attended weekly 4-H STEM focused project club meetings
- Youth completed a variety of lessons following the experiential learning model
- Lesson included STEM based initiatives and challenged youth to apply foundational knowledge while also building that knowledge set, and confidence

Data Collection Methods
1. Youth Pre & Post Likert Survey
2. Guardian Pre & Post Likert Survey
3. Weekly Youth Journals
4. Guardian Open-Ended Assessment
5. Youth Exit Interview
6. Guardian Exit Interview

Results

Youth Results

Survey Responses- graph (below) and paired t-test values (center right)

should I have a chart with what the specific survey questions were?

Survey results show statistically significant changes in response type to all excluding Q6 (about math) and Q9 (about record books. Supported by Paired t-test values

Journal Entries- graph and trend line "best fit" (top right)+ youth Quotes stressed (negative) to a positive emotion

Exit Interviews- Data collected, pending analysis

Guardian Results

Survey Responses- Data collected, pending analysis

Mid-way Assessment- Data collected, pending analysis

Exit Survey- Data still coming in (remote answers)

Question	Paired t-test Value
1	0.02
2	0.00
3	0.00
4	0.04
5	0.00
6	0.32
7	0.02
8	0.02
9	0.77

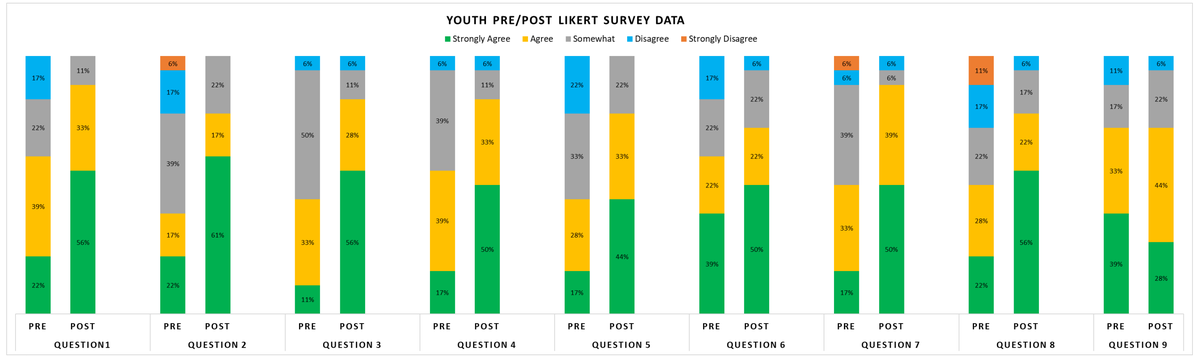


Figure 2. Youth Pre/Post Liker-Survey Data

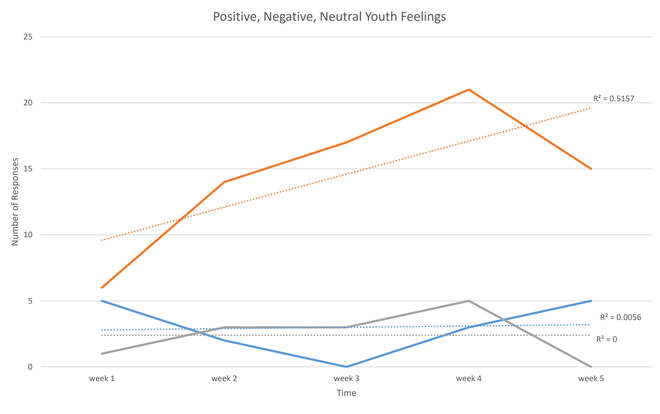


Figure 3. Youth responses to, How did you feel during today's activity, broken into three categories, Positive, Negative, and Neutral emotions

Conclusion

Pending completion of data collection and analysis

- Question 2 which asked, I use STEM in my daily life, shows that 22% of youth indicated a, I Strongly Agree response, on the pre survey and 61% of youth indicated this response on the post survey, a 39% change. When examining youth who assigned both, I strongly agree and agree responses, 78% of youth indicating one of these two values during the post survey. Question two has a paired t-test value of 0.00!

RESEARCH POSTER PRESENTATION DESIGN © 2022
www.PosterPresentations.com