Colorado Collective Outcomes Evaluation Toolkit

Module 4: Telling Your Story (With Data)

The Final Step in Evaluation

Throughout this evaluation toolkit, you've taken time to authentically engage with your participants; understand your program and map it out using a logic model; develop an evaluation plan that defines your outcomes and objectives; and identify tools and data collection methods to gather data from your participants. The final step in the evaluation process is analyzing the data and reporting results. While data analysis can feel intimidating, it is actually one of the most exciting phases of the evaluation process. This is when you learn what is working and where there are opportunities for improvement.

Additionally, this module provides exciting strategies to tell your story in ways that resonate with the community and engage your stakeholders.

Preparing Quantitative Data for Analysis

As a reminder, quantitative data refers to numerical data, data that can be defined by categories, or data that can be placed on a scale. Quantitative data can be converted (or coded) into numerical data for analysis. There are several steps evaluators go through in order to analyze quantitative survey data.

Code the data. First, you will need to transform the survey data into simple numerical terms by developing and using a coding system. A coding system converts scale or categorical data into numbers in order to run statistical analysis. The following examples illustrate how and when to code data:

1. Question: Did you enjoy this field trip?
Answers: No, Yes
Code: No = 0, Yes = 1

2. Question: Which program did you participate in?
Answers: Field trip, Afterschool program, Weekend family event, Nature hike
Code: Field trip = 1, Afterschool program = 2, Weekend family event = 3, Nature hike = 4

3. Question: How much do you agree with the following statement? "I learned how to take good care of nature."
Answer: Strongly disagree, Disagree, Not sure, Agree, Strongly agree
Code: Strongly disagree = 1, Disagree = 2, Not sure = 3, Agree = 4, Strongly agree = 5

If you are using a program such as SurveyMonkey to administer the survey, you have the option of downloading the response data as "Actual Answer Text" or "Numerical Value." The "Numerical Value" option does the coding and converts the data to numbers. It is important to understand how the data was converted prior to analyzing it.
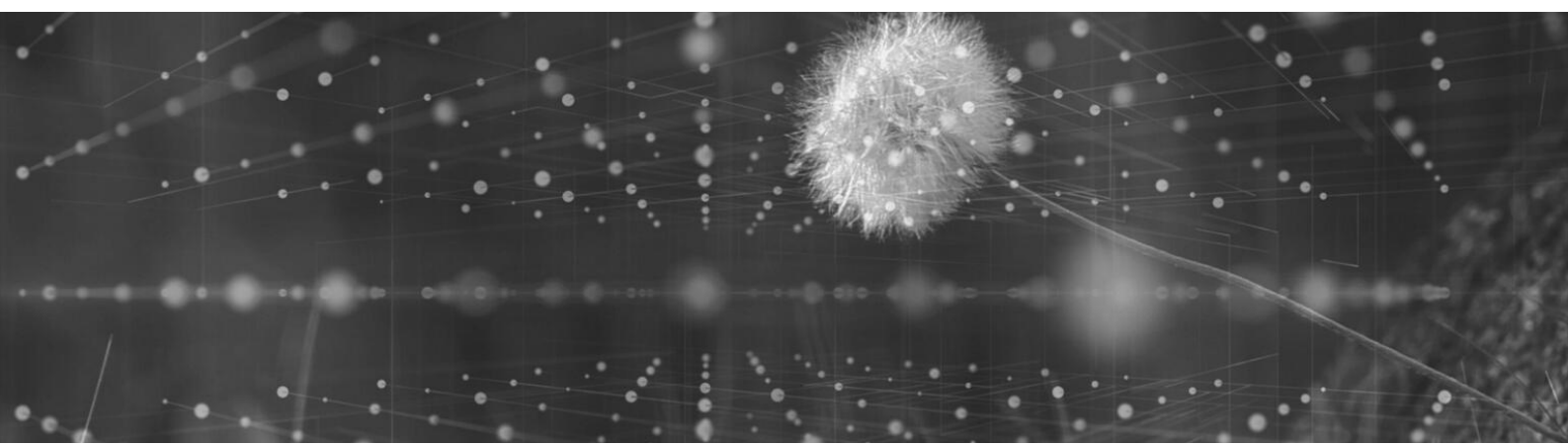
Enter the data. If you are administering the survey electronically through a platform such as SurveyMonkey or Google Forms, the data has already been entered. You will need to download the data from the platform into Excel in order to conduct your own data analysis. If you administered the survey using paper and pencil, you will need to enter the data into a spreadsheet, using the codes you outlined in the previous step. Be sure to assign each survey a unique identifier in case you need to go back and confirm the data.

Clean the data. Before analyzing the data, double check that it has been entered correctly and understand if there are any anomalies in the data. You will need to decide how to handle potential irregularities that come up with the surveys. For example, what if a participant selects multiple responses on a question that requires only one answer? Or how will you handle a survey where the participant fills out their name and age only but doesn't complete the rest of the survey? Identify a protocol to address and clean those anomalies prior to analysis.

It is important to have a protocol to check that data was entered correctly and that there were no errors, if manually entering the data. One useful protocol is to do a 10% quality check by randomly selecting 10% of the surveys from the stack and checking the accuracy of the data entry. If errors are found, do another 10% check on the surveys. Another useful tool to check the accuracy is to run some descriptive statistics on the data, as described below. Descriptive statistics such as frequencies and means are useful in identifying irregularities in the data.

Determine what you want to learn from the data.
There are a lot of ways to analyze and understand the data. Spend time thinking through how you plan to use the data and what would be the most meaningful. Here are some basic ways to analyze data:

- Calculate the number of participants that rated scaled questions high, such as Agree and Strongly agree.

- Calculate the percentage of participants that rated scaled questions high, such as 4 or 5 on a 5-point scale.

- Calculate the mean (or average) rating of all participants on a scale score, such as the average rating of all students on a scale of 1 to 5.

Refer to your evaluation questions to help define how you will analyze the data. What do you want to learn? Who wants the information?

Do you have data that can be rolled up to the Colorado Collective Outcomes Project? We want to see it!

Descriptive and Inferential Statistics

Descriptive Statistics

Descriptive statistics are the most basic type of data analysis and help describe the data. They can be used to paint a picture of the perceptions of those who participated in the evaluation; however, they cannot be used to make inferences into the larger population. Common descriptive statistics include frequencies, percentages, means, and minimum and maximum.

Inferential Statistics

Inferential statistics are a more advanced form of data analysis and are used to compare groups or to make generalizations (or inferences) about the larger population. In inferential statistics, the characteristics of the sample (the sample size, whether it is random, whether it is representative of the population, etc.) are important to the use of and success of the statistical test. Common inferential statistics include t-tests, regression and Analysis of Variance (ANOVA). Statistical software such as SPSS and SAS are helpful tools for conducting inferential statistics.

Analyzing Quantitative Data Using Descriptive Statistics

Descriptive statistics are the most basic type of data analysis and help describe the data. They can be used to paint a picture of the perceptions of those who participated in the evaluation; however, they cannot be used to make inferences into the larger population. Below are the common types of descriptive statistics that are used in program evaluation.

- **Frequencies (or counts).** This method calculates (or counts) the number of times a standard is met and is often noted by "n." For example, the number of participants that are age 8, the number of participants who participated in the nature hike, or the number of participants that selected "Strongly agree" on a survey question.

- **Percentages.** This method is used to show the proportion of the participants that meets the criteria. For example, it can be used to describe the ratio of the participants that are under the age of 10, the percentage of the population that "strongly agrees" with a statement, or the proportion of the participants that is "highly satisfied" compared with the proportion of the participants that is "highly unsatisfied." Percentages are calculated by taking the number of times a response is given divided by the number of people who responded to the question. For example, 100 participants completed a survey and 75 indicated that are under the age of 10 years old. 75/100 = .75 or 75% of survey participants are under the age of 10.

- **Means (or averages).** A mean calculates the average of a set of numbers in order to identify a tendency in the data or a central number. It is best used in scale data when it has a meaningful and continuous order. To calculate the mean, take the sum of the values and divide by the number of values. Examples might include the average rating of participants on a scale of 1 to 5, where 1 = strongly disagree and 5 = strongly agree; or the average score of students on a pre-test about conservation practices; or the average amount of time participants spend in class.

- **Minimum and maximum.** These methods are useful in illustrating the range in data and noting the highest rating and the lowest rating. For example, the youngest student and the oldest student, or the least amount of time spent in nature to the most amount of time spent in nature.

- **Standard deviation.** Standard deviation calculates how spread out the data and responses are. A high standard deviation indicates responses vary widely, while a low standard deviation indicates responses are relatively close. It is often associated with a mean to give more meaning to the data set. For example, if 100 students responded to a question about satisfaction on a scale of 1 to 5 and the average was a 3, it is unclear whether most students responded with a 3 or if half indicated a 5 and the other half indicated a 1. Standard deviation will help provide clarity.

Common Formulas in Excel

Frequency/Count
=count(cell range)
Example: =count(k3:k40)

=countif(cell range, criteria)
Example: =countif(k3:k40,2)

Count multiple criteria
=countif(cell range, criteria)+countif(cell range, criteria)

Example:
=countif(k3:k40,4)+countif(k3:k40,5)

Minimum and Maximum
=min(cell range)
Example: =min(k3:k40)

=max(cell range)
Example: =max(k3:k40)

Mean
=average(cell range)
Example: =average(k3:k40)

Sum (add all numbers)
=sum(cell range)
Example: =sum(k3:k40)

Preparing Qualitative Data for Analysis

Unlike quantitative data, qualitative data is not inherently numerical as it includes descriptive and narrative data. It is important to note, however, that you can still analyze qualitative data. Through qualitative data analysis, you can identify themes or trends and determine findings about those involved in the evaluation.

Organize the data. To begin, you will want to compile and organize the qualitative data you are analyzing, such as focus group notes, interview notes, or open-ended survey questions. Ensure they are all in a format to be able to read and take notes. One suggestion is to enter the data into an Excel spreadsheet to have all related data in one place. Keep in mind the evaluation questions, outcomes and objectives you are seeking to address through the analysis.

Review the data and identify themes. Familiarize yourself with all of the data by reading through each item. As you read, begin identifying themes, trends, similarities or differences.
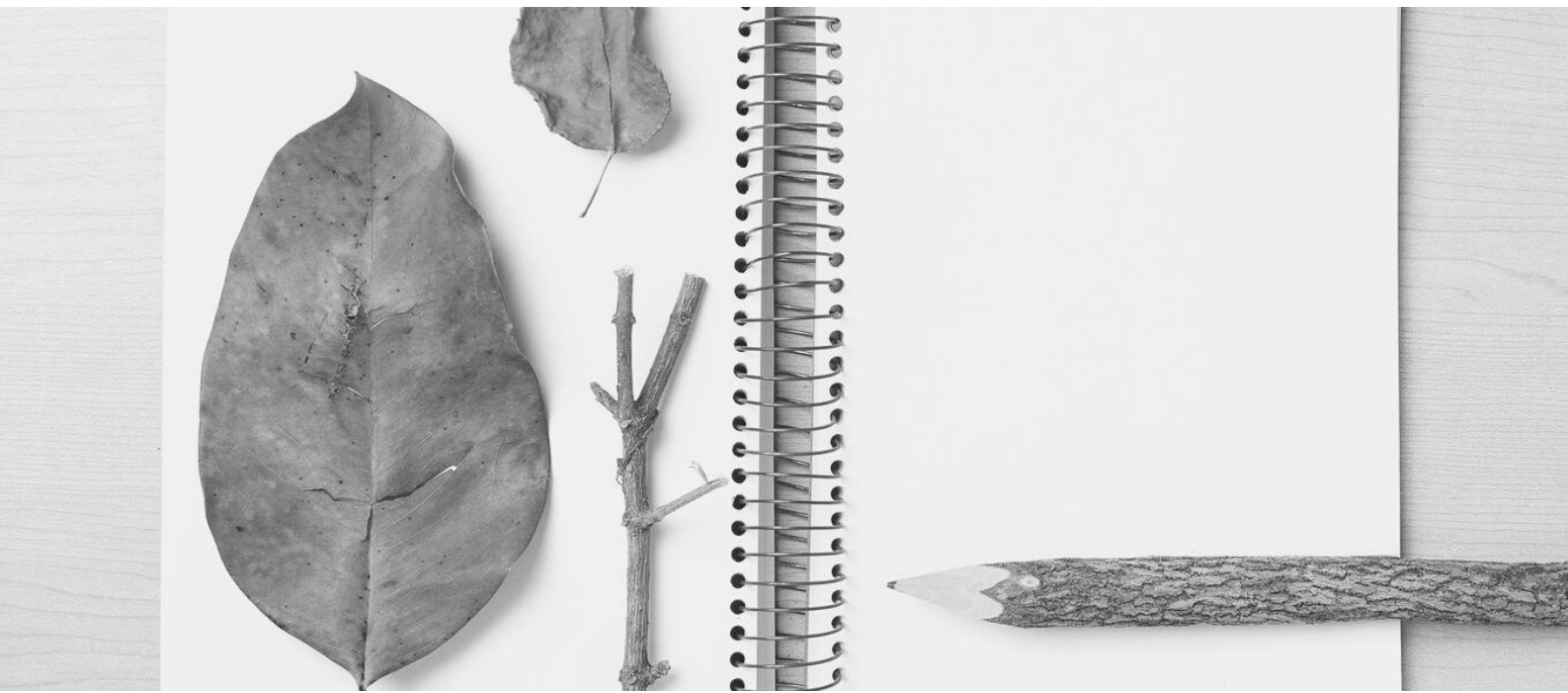
Analyzing Qualitative Data

Code the data. Once you understand the information and themes, begin categorizing and coding the data. This can be done in several ways, such as highlighting themes in different colors, using Excel to add columns, or using a qualitative data analysis software such as Dedoose or ATLAS.ti.

Summarize findings. After you have identified themes and coded the data, summarize the findings. It is important to note that qualitative data can often be summarized quantitatively. For example, if 10 out of 20 students wrote they liked fishing best when asked what they liked about the field trip, you can indicate that 50% of respondents liked fishing best.

Qualitative data adds rich stories or quotes to an evaluation report. Think about how you can use both quantitative and qualitative data to paint a full picture of your programs.

Reporting Evaluation Findings

Now that you have analyzed the data, it is time to report it to your stakeholder groups. Before reporting and presenting your results, refer to the initial evaluation questions. What do you want to learn from the evaluation and who is the intended audience? Ensure the evaluation report is structured based on these two guiding elements. For example, if the evaluation is used to understand the strengths and weaknesses of a program and is geared toward program staff, outline the report in a way that highlights the successes of the program along with opportunities for improvement and provide recommendations at the end. On the other hand, If the program is geared toward funders, be sure to include all of the outcomes and objectives they are expecting you to report out on. It is often helpful to include successes and lessons learned, along with a quote or story about the specific program to funders as well.

Spend time reflecting on how the voice of your community is being represented in the report. Are you including all voices? Are you aware of how power or bias might be present in reporting?

How to tell a more effective story about Environmental Education

CAEE partnered with FrameWorks Institute in 2020 to develop a framing strategy for advocates, educators, practitioners and program leaders to tell a more effective story about environmental education. By utilizing a shared framing strategy, we will be able to provide a clear vision for strengthening environmental education and expanding access to opportunities for everyone.

The FrameWorks guide provides the following five framing recommendations to tell a more effective story about environmental education:

1. **Set the scene.** Provide a clear definition of environmental education.
2. **Invite people into the story.** Paint a big picture of why environmental education matters to all of us.
3. **Reveal the plot.** Explain key processes and cause-effect relationships.
4. **Feature the full cast of characters.** Use inclusive language to place disparate outcomes in the context of universal needs and shared responsibilities.
5. **Offer a compelling conclusion.** Provide concrete solutions that we can implement together to strengthen environmental education and become the global society we want to be.

Explanatory Chain as a Tool to Communicate and Explain

How does environmental education enhance positive youth development? How does it make our communities healthier? How does it link to K–12 curricula? The answers to these and other questions involve complex processes, which are largely invisible to the general population (How to tell a more effective story about Environmental Education).

Initial Root Cause **+** Mediating Factors **=** Impacts
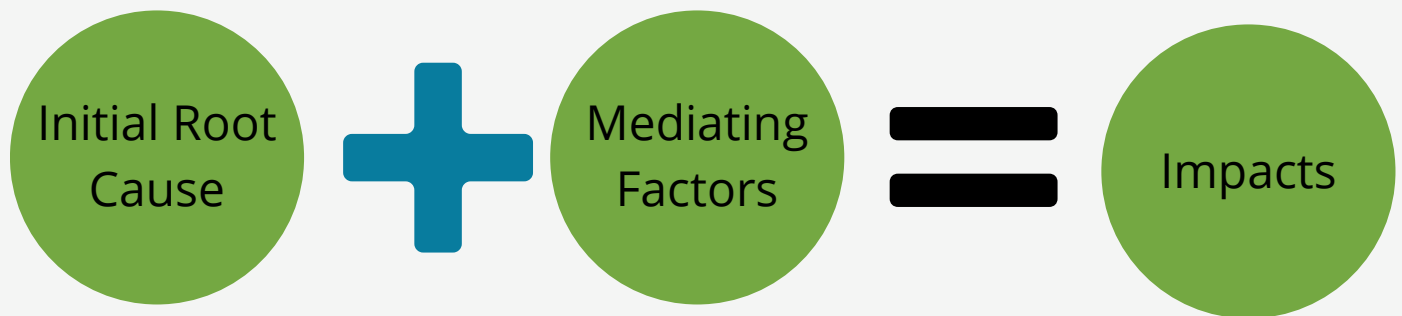
One of the tools FrameWorks has provided is the Explanatory Chain. "An Explanatory Chain is a clear, concise, well-framed explanation of the causes of a problem, including the mechanism by which the problem is created." (Explanatory Chains Brief.) It offers a clear path of logic, that connects causes to consequences and builds a shared understanding. When used effectively, an Explanatory Chain empowers individuals to understand an issue and how to address it more effectively.

Consider your evaluation data. What was was the chain of events leading to your results? What are the processes that might be invisible to your stakeholders? How might explaining those processes help them increase their support for your program? With your team, list a series of bullets describing: the problem, how your program mediates the problem, and what might happen as a result of the program. How can this help you tell your story?

Metaphors as Tool to Explain Complex Processes

Explaining complex processes to funders and stakeholders can be difficult, and often takes time. One tool that can help is to provide an analogy between a new or abstract concept, and a comparable but more familiar and concrete one. The following metaphors have been tested extensively by the Frameworks Institute through a variety of issues and are recommended to help explain particular aspects of environmental education.

Education
Wiring Up

We can energize learning by establishing connections between the different places that ignite our passions and generate deeper understanding. Through an extensive circuitry of experiences, EE helps ensure that the knowledge and skills students gain in one place can easily flow into new contexts, powering further exploration and boosting ongoing innovation.

Positive Youth Development
Cultivating Connections

Just like a root system supplies nourishment to a plant to help it flourish, environmental education provides kids with enriching experiences and supportive relationships that foster lifelong stability and continual growth.

Health and Wellness
Foundations of Health

Healthy communities are built on solid foundations, assembled by many different professional sectors, institutions, and people. A dependable foundation includes reinforcements, like access to green space, occasions to socialize, and quality learning opportunities. Environmental education programs supply these essential components of a strong and stable foundation and, therefore, support healthy, thriving communities.

Social Justice
Charging Stations

EE sites are like charging stations that power up kids' learning. Some families benefit from high wattage areas that provide lots of opportunities, while other families have very little to plug into. A patchy and unreliable grid means our EE system is not as strong as it could be, but we can rewire it to eliminate dead zones and boost learning for everyone.

Telling your Story with Research and Data

In Module 1, we highlighted the report to complement this evaluation toolkit called *Grounding in Research and Data: A Toolkit for Environmental Education Organizations to Understand Outcomes and Impact.* This report not only can help your organization lay the foundation for the evaluation, but it also provides tools and information to help with telling your story at the completion of the evaluation.

First, visit the report to understand whether there is publicly available data that can speak to your outcomes and complement your evaluation findings.

Second, each outcome area features a "Telling your eeStory" section that provides organizations with an example of how to communicate evaluation efforts to a variety of stakeholders, using the examples presented above. Visit this report, attached with the Module, to gather ideas and insights.

Now that you've had an opportunity to develop your evaluation, we encourage you to revisit the report to see how to tell your story.

Additional Resources

Moyer, J., Trester, A.M., & Nichols, J. (2020). How to Tell a More Effective Story about Environmental Education. Washington, DC: FrameWorks Institute. To access the full report, visit: https://caee.org/eeStory

FrameWorks Institute. (2019). Unleashing the Power of How: An Explanation Declaration. Washington, DC: FrameWorks Institute. https://www.frameworksinstitute.org/publication/unleashing-the-power-of-how-an-explanation-declaration-2/

FrameWorks Institute and National Network for Ocean and Climate Change Interpretation. Framing With Explanatory Chains Brief. https://climateinterpreter.org/sites/default/files/resources/framing_with_explanatory_chains_handout.pdf