Chapter 2

1 — 2 — 3

Sampling Techniques

Program Evaluation Toolkit

Module 4 Evaluation Samples

REL Central at Marzano Research

COLORADO   KANSAS   MISSOURI   NEBRASKA   NORTH DAKOTA   SOUTH DAKOTA   WYOMING

Important Sampling Considerations

- **Identification**: Whom should I include in the sample (for example, parents, teachers, students, administrators)?

- **Type of sample**: Is a random or nonrandom sampling technique appropriate?

- **Sample size**: How many participants do I need to include in the sample to collect enough to answer my evaluation questions?

Sampling Techniques[1]

- **Random sampling**: Every individual in a population has a chance of being selected for the sample.

- **Nonrandom sampling**: Only some individuals in a population have a chance of being selected for the sample, or the probability of being in the sample is unknown for some individuals.

When to Use Random Sampling[2]

- Random sampling can be helpful when you have a large population to draw from and it is impossible to collect data from everyone.

- You need to ensure that your sample is representative of the population.

- A random sample is similar to the entire population with respect to all possible characteristics:

  o Even characteristics that cannot be measured or observed.

  o Differences between the sample and population occur only by chance.

Preconditions for Random Sampling[1]

- A list of all possible units that you could sample (for example, parents, teachers, students, schools, classrooms).

- The ability to take a reasonably large sample.

  o If a random sample is small, it will likely differ from the population in important ways just due to chance.

  o Chapter 3 addresses how large a sample should be.

Program Evaluation Toolkit

Module 4 Evaluation Samples

Randomly Selecting a Sample with Microsoft Excel

Enter the Excel function "=RANDBETWEEN(0,1)" in the first cell.

Click and drag the lower right corner of the cell that contains the function to the bottom of the list.

Students now have a random number that indicates invitation to take the survey.

Types of Random Sampling

- **Simple**: Participants in a population are selected with equal probabilities and without regard to other characteristics.

- **Stratified**: Participants are first divided into groups based on known characteristics (for example, gender, race/ethnicity), and then separate simple random samples are taken from each group. In this technique, individuals can be selected at random but with different probabilities for characteristics of interest.

- **Clustered**: Participants are placed into groups, and groups are randomly selected to be in the sample (that is, groups are sampled rather than individuals).

Program Evaluation Toolkit

Module 4 Evaluation Samples

Simple, Stratified, and Clustered Random Sampling

- Each school box represents 20 teachers.

- The final sample includes 40 teachers randomly selected from among the total population of these four schools.

School 1

School 2

School 3

School 4

Sample

Program Evaluation Toolkit

Module 4 Evaluation Samples
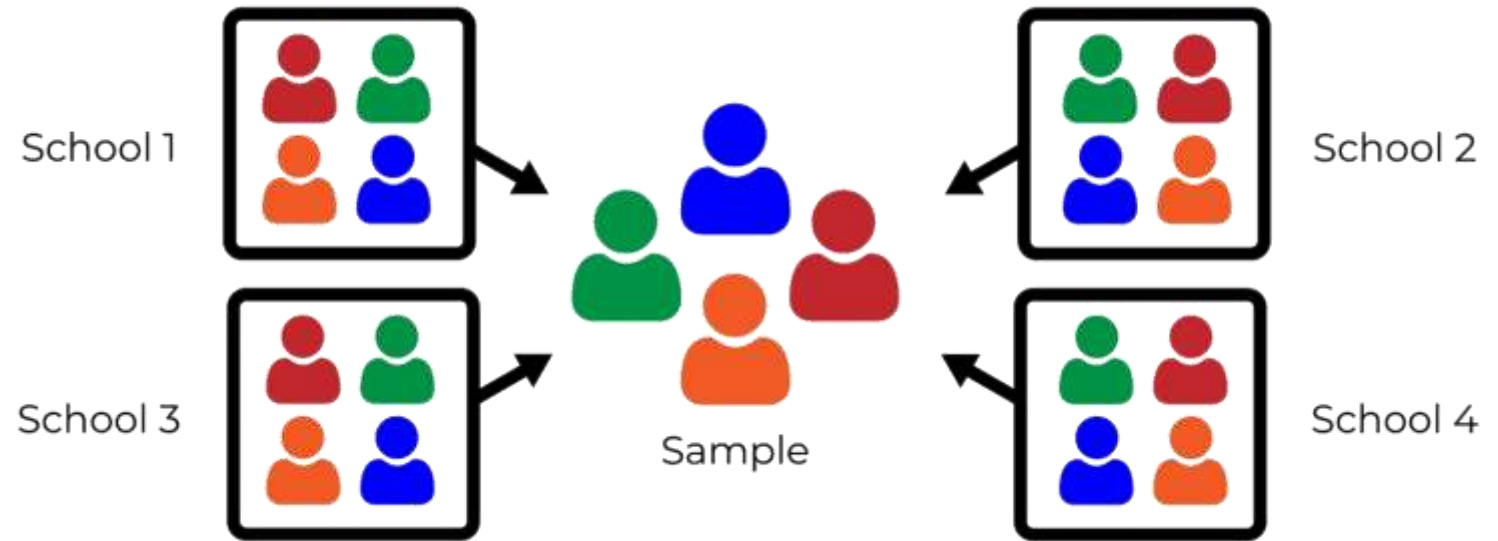
Advantages of Different Types of Random Sampling

Stratified random sampling:

- Can ensure certain groups are represented in the sample.

Clustered random sampling:

- Not necessary to have a list of all individuals in the population.

Types of Nonrandom Sampling[3]

- **Consecutive**: Participants meeting some criteria are recruited until the desired sample size is reached.

- **Convenience**: Participants are chosen based on their availability.

- **Snowball**: Participants are recruited through referrals.

- **Purposive**: Participants are selected for certain characteristics to meet the objectives of the evaluation.

Program Evaluation Toolkit

REL Central at Marzano Research

COLORADO   KANSAS   MISSOURI   NEBRASKA   NORTH DAKOTA   SOUTH DAKOTA   WYOMING

Additional Resources
- *Summary of Sampling Types*

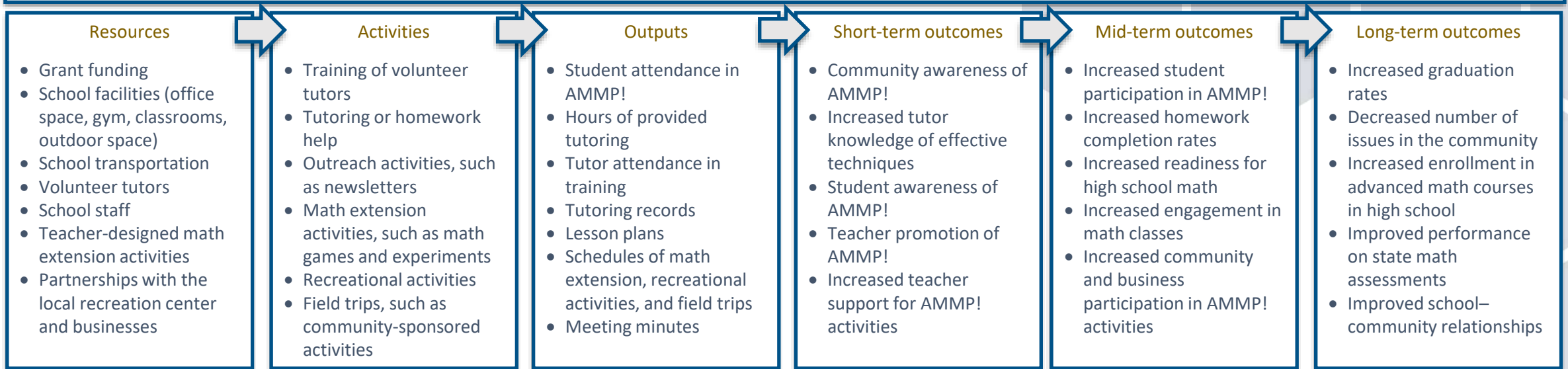Module 4 Evaluation Samples

AMMP! Example

- A middle school has been experiencing issues with low rates of math homework completion, resulting in low math achievement.

- The community has also been experiencing issues with unsupervised students after school.

- AMMP! provides math tutoring, math extension, homework completion time, recreational activities, and field trips during after-school hours.

AMMP! Logic Model

Problem statement: Students at the middle school have low homework completion rates (lower than 40 percent) and low performance on state math assessments (only 25 percent proficient or advanced). In addition, the community around the middle school is experiencing issues with unsupervised students after school. Incidents involving middle school students are up 17 percent over the last three years. Stakeholders, including school staff, students, parents, community services, property owners, and businesses, are concerned about the low performance and unsupervised after-school time. Research has indicated that low math performance in middle school is correlated with low graduation rates and that unsupervised after-school time is related to an increase in community issues. The school district has recently received a federal grant and would like to use these funds to address the problem.

Resources	Activities	Outputs	Short-term outcomes	Mid-term outcomes	Long-term outcomes
• Grant funding • School facilities (office space, gym, classrooms, outdoor space) • School transportation • Volunteer tutors • School staff • Teacher-designed math extension activities • Partnerships with the local recreation center and businesses	• Training of volunteer tutors • Tutoring or homework help • Outreach activities, such as newsletters • Math extension activities, such as math games and experiments • Recreational activities • Field trips, such as community-sponsored activities	• Student attendance in AMMP! • Hours of provided tutoring • Tutor attendance in training • Tutoring records • Lesson plans • Schedules of math extension, recreational activities, and field trips • Meeting minutes	• Community awareness of AMMP! • Increased tutor knowledge of effective techniques • Student awareness of AMMP! • Teacher promotion of AMMP! • Increased teacher support for AMMP! activities	• Increased student participation in AMMP! • Increased homework completion rates • Increased readiness for high school math • Increased engagement in math classes • Increased community and business participation in AMMP! activities	• Increased graduation rates • Decreased number of issues in the community • Increased enrollment in advanced math courses in high school • Improved performance on state math assessments • Improved school–community relationships

Additional considerations: Availability of tutors and school facilities.
Unsupervised after-school time results in increased community issues. Including recreational activities will improve attendance.

Program Evaluation Toolkit

REL Central at Marzano Research

COLORADO   KANSAS   MISSOURI   NEBRASKA   NORTH DAKOTA   SOUTH DAKOTA   WYOMING

Additional Resources
• *AMMP! Logic Model*

Module 4 Evaluation Samples

Activity: AMMP! Scenario 1

- The AMMP! evaluation team wants to know teachers' perceptions of the program before having an informal conversation with a potential funder the following week. So, the team has only one week to conduct interviews with teachers. What type of sampling should the team use?

  o Convenience sampling

Program Evaluation Toolkit

Module 4 Evaluation Samples

Activity: AMMP! Scenario 2

- The AMMP! evaluation team wants to know whether the level of buy-in for the program is related to teachers' educational attainment and teaching experience. The team wants to use the results to describe the program for future use in the entire district. What type of sampling should the team use?

  o Stratified random sampling

Activity: AMMP! Scenario 3

- The evaluation team wants to interview students from each racial/ethnic minority group and each grade level (6, 7, and 8) to identify any demographic characteristics that are associated with students' perceptions of how well AMMP! meets their needs. The team has exactly 15 interview slots to fill. What type of sampling should the team use?

  - Purposive sampling

Program Evaluation Toolkit

Module 4 Evaluation Samples

Activity: AMMP! Scenario 4

- To understand how students who need the most support in math perceive AMMP!, the evaluation team wants to interview teachers, tutors, and parents of students in remedial math classes. Even though the team does not have the resources to interview everyone, the team wants the results to generalize to all struggling students. What type of sampling could the team use?

  ○ Clustered random sampling

Activity: AMMP! Scenario 5

- The AMMP! evaluation team wants to interview students who are enrolled in the program and have improved in homework completion. The team has exactly 15 interview slots to fill. What type of sampling should the team use?

    o Consecutive sampling

Program Evaluation Toolkit

Module 4 Evaluation Samples

Activity: AMMP! Scenario 6

- After a training session, an AMMP! tutor tells the evaluation team that some tutors felt some of the information from the training was incorrect. The team wants to better understand how this perception might affect the program. What type of sampling should the team use?
  - Snowball sampling

Activity: AMMP! Scenario 7

- A large suburban district has picked up AMMP!. The district's evaluation team wants to make claims that reflect benefits for the entire population. What type of sampling should the team use?

  o Simple random sampling

Program Evaluation Toolkit

REL Central at Marzano Research

COLORADO KANSAS MISSOURI NEBRASKA NORTH DAKOTA SOUTH DAKOTA WYOMING

Additional Resources

- *Extra Practice with Sampling Types*

Module 4

Evaluation Samples

Thank You

Please visit our website and follow us on Twitter
for information about our events, priorities, and research alliances,
and for access to our many free resources.

ies.ed.gov/ncee/edlabs/regions/central/index.asp
@RELCentral

or contact us at

RELCentral@marzanoresearch.com

REL Central at Marzano Research

COLORADO   KANSAS   MISSOURI   NEBRASKA   NORTH DAKOTA   SOUTH DAKOTA   WYOMING

References

1. Schreier, M. (2018). Sampling and generalization. In U. Flick (Ed.), *The Sage handbook of qualitative data collection* (pp. 84–98). Sage.

2. Kennedy, C. (2017, May 12). *How can a survey of 1,000 people tell you what the whole U.S. thinks?* Pew Research Center. https://www.pewresearch.org/fact-tank/2017/05/12/methods-101-random-sampling/

3. Onwuegbuzie, A. J., & Leech, N. L. (2007). Sampling designs in qualitative research: Making the sampling process more public. *Qualitative Report, 12*(2), 238–254. https://eric.ed.gov/?id=EJ800181