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Research, Technology, & Students With Disabilities: Assessing Progress of Your Technology Initiatives

Guide for State and Local Education Leaders

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About This Guide

This guide was developed as a companion to the Center on Technology and Disability's video series *Research, Technology, & Students With Disabilities: Supporting LEA & SEA Decision Making*. The video series is designed for leaders of state education agencies (SEAs) and local education agencies (LEAs) who want an overview of conducting and participating in research and evaluation studies. This guide extends the learning in the series and is designed to support education leaders as you evaluate progress toward meeting the goals and intended outcomes of your educational technology initiatives and programs.

This guide is not intended to teach you everything you need to know to conduct an evaluation; rather, it serves as a starting point with some targeted resources to support your work in the evaluation process.

Why Conduct Evaluations of Technology Initiatives?

The primary goal of any new technology initiative or program—whether assistive technology or instructional—is to improve student learning outcomes. Investments in new technologies at the state, district, school, or classroom level are driven by a desire to improve teaching and learning to better prepare students for the future. To maximize ever-shrinking budgets for the purchase and implementation of technology to meet the needs of diverse users, education leaders need reliable data about what types of tools work for which students and under what conditions.

With the federal focus on results-driven accountability (RDA) in special education, the field is shifting focus from compliance with special education laws to improvement strategies that result in improved outcomes for students with disabilities. Following the vision of RDA, we need to consider how to align initiatives throughout the educational system, including those that leverage technology tools and resources. As technology becomes a more integral part of teaching and learning, state and local education leaders need reliable data on how assistive and instructional technology (AT/IT) initiatives are helping to improve outcomes for students with disabilities (SWDs), and in which context and setting. Furthermore, the funding that states and districts receive to implement their technology plans often may have requirements from the funding agency (e.g. federal, state, or foundation) for conducting some type of evaluation.

Conducting evaluation studies in schools and districts is a critical component of ensuring that technology initiatives are being implemented successfully and achieving desired outcomes for all students, particularly those with disabilities. This process also forms the basis of a cycle of continuous improvement, allowing you to shift strategies and resources midstream and realign initiatives to better meet changing goals.

Getting Started

If you are reading this guide, you have likely recognized the need for conducting an evaluation of your technology implementation initiatives or process. You may have received funding recently for a new technology implementation project, or launched a new professional development program. If you've received external funding, the funding agency may require an evaluation to demonstrate the value of their investment; stakeholders throughout your school or district (e.g., superintendents, parents, professional development coordinators, teachers) all want to know how the technology is being used, whether it is affecting student learning outcomes, and how well teachers are integrating technology into their practice. An evaluation of your technology initiative will likely have to answer multiple questions and respond to the needs of a variety of stakeholder groups in your district. This guide will help you understand how to conduct an evaluation that is useful for you and provides the types of information you need.

The resources, tips, and worksheets that follow are designed to support the process of conducting an evaluation, from articulating objectives and intended outcomes to developing evaluation questions to analyzing results of data collection efforts, involving stakeholders in the process and making data-driven decisions to improve outcomes of your initiative.

Elements of an Evaluation

Though every evaluation is different, and conducted for different purposes, most evaluations generally will follow the same basic steps, leading to the use of the results of your evaluation to make improvements to your program.

STEPS IN CONDUCTING AN EVALUATION

1. Build your evaluation team.
2. Get an overview of the program.
3. Determine the purpose of the evaluation.
4. Develop a logic model.
5. Develop your evaluation questions.
6. Design your evaluation.
7. Develop a plan for collecting data.
8. Develop a plan for data analysis.
9. Draw conclusions and communicate results.
10. Use your results to improve your program.

Build Your Evaluation Team

Evaluating a technology initiative or implementation process is a challenging task that takes considerable time and effort—do not go it alone! This does not mean, however, that you must hire an external evaluator for this process; many states use staff expertise to plan and carry out evaluation studies. Before assembling your team, conduct a thorough inventory of available resources in terms of staff time and expertise, as well as any additional support or training that staff may need. As you identify staff to participate, determine roles for

- reviewing existing technology plans and initiatives;
- designing the evaluation plan;
- managing the overall evaluation timeline and overseeing the logistics and budget for evaluation activities;
- collecting and organizing data;
- conducting evaluation activities;
- analyzing data and creating data displays of results; and
- communicating and engaging with interested stakeholders and communicating the purpose of the evaluation as well as progress with teachers, parents, community members, and others.

Once you have outlined team roles and responsibilities, you may consider hiring a consultant for specific tasks or to provide thought leadership and advice.

Get an Overview of the Program

Ideally, you would begin your evaluation planning at the same time you are planning your new technology program. Getting started early allows you not only to collect critical baseline data before implementation, but also to structure professional development activities and purchases that align with your evaluation design. However, designing a technology evaluation in tandem with a technology implementation plan is not always possible. Even if implementation is under way, you still can design evaluation activities. If this is the case, gather as much information as you can about the program to understand the background and goals. You might review

- technology plans (state or district),
- results of previous evaluations (if available),
- previous data collection activities,
- results of needs assessments (if conducted),
- examples of technology integration in the district/school,
- meeting minutes when technology purchasing/integration plans were discussed and decided, and
- results of similar evaluations at other schools or districts in your state (or across the country).

In addition, seek out the key decision makers involved in the implementation plan to discuss the program's goals, motivations, and rationale.

Determine Your Purpose for Evaluation

There are many different reasons for your school or district to undertake an evaluation of your technology implementation program. You may be interested in

- providing information on program aspects that work, as well as potential problems,
- identifying potential problems early on so you can address them before advancing too far in your implementation process,
- determining what kind of professional development or technical assistance might be needed to help teachers better integrate technology, or
- determining the impact of your program.

Before you can begin an evaluation, you will need to determine your purpose for evaluation; you may even have more than one, depending on your initiatives and what you're hoping to learn. The purposes you identify will help determine the evaluation design. In addition, a primary purpose of every evaluation should be to focus on continuous improvement. Evaluation results are meaningless if they are not used to better understand what works and what doesn't, and how to make decisions that will improve teaching and learning. Use Worksheet 1 to help you identify the purposes for your evaluation and how they might affect your evaluation design.

Worksheet 1: Why Are We Evaluating?

As you identify the various purposes for conducting an evaluation, consider the needs and interests of key stakeholders (e.g., state and district leaders, parents, funders, teachers).

Stakeholder Group	What Stakeholders Want From an Evaluation

What do YOU want from an evaluation?

Looking at what both you and other stakeholders want from an evaluation, what are two or three major reasons or purposes for doing your evaluation?

How might these reasons affect the design of your evaluation?

Develop a Logic Model

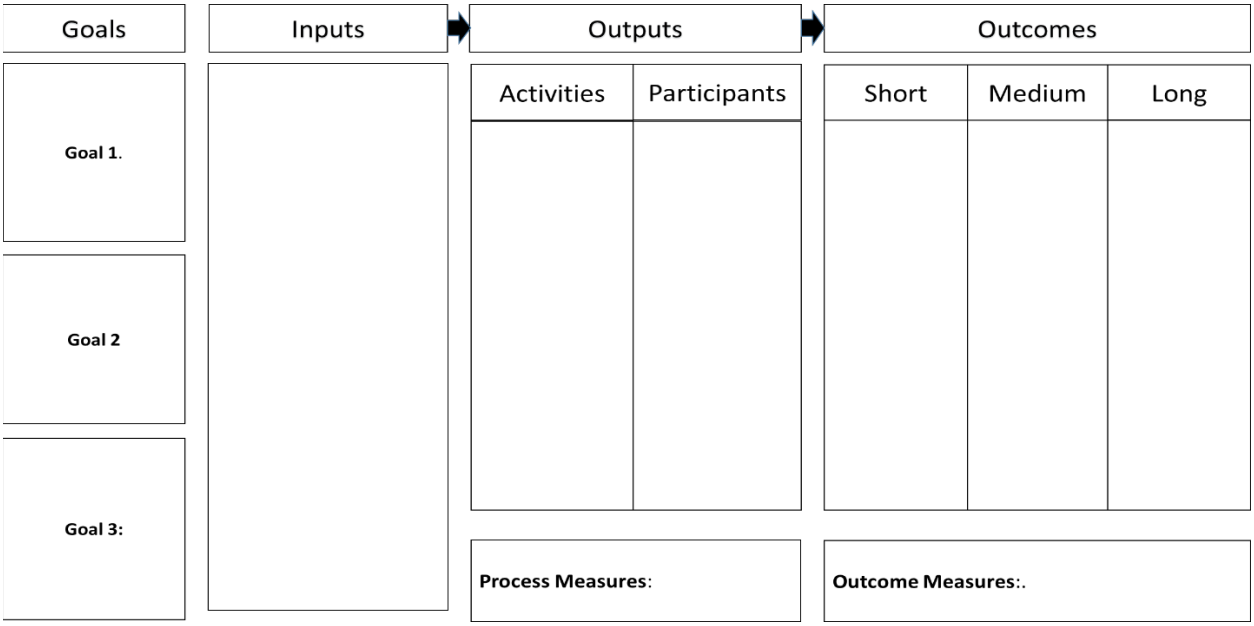
The next step in developing your evaluation is to create a logic model. A logic model is a graphic representation of what you hope to accomplish with your initiative, showing causal relationships among project goals, activities, outputs, and outcomes. The logic model serves as the starting point for your evaluation and will lead to the development of your data collection and analysis plans.

By clearly articulating the relationships among project goals, activities, outputs, and outcomes, the logic model defines appropriate evaluation questions and data needed to measure project processes (implementation) and performance (outcomes).

Some of your goals and activities may be process-oriented system goals (i.e., all classrooms will have access to high-speed Internet, all teachers will have access to an online library of educational resources and integrate them into their curriculum). Other goals will focus on student outcomes (i.e., the use of a new technology program will lead to improved reading scores for struggling students). Often, progress in process-oriented system goals facilitate a structure and foundation for effective implementation, as well as progress toward achieving student outcome goals to lead toward your desired result: improved student outcomes. For example, the goals of improving access to high-speed Internet in every classroom and ensuring that teachers are using quality online resources as part of the curriculum will likely contribute to the achievement of end-result goals of improved student achievement. That is, you cannot achieve the desired outcome (improved student achievement) without achieving your process-oriented goals of improving wireless infrastructure and improving professional development.

Figure 1 is an example of a logic model that addresses goals, inputs, outputs, and outcomes, as well as measures that will be used.

Figure 1. Example Logic Model



In this detailed logic model, you will list your identified goals, as well as the following:

- Inputs: the resources or investments for your program
- Outputs: the activities, services, events, and products for your intervention, as well as the participants involved in each
- Outcomes: *short, medium, or long-term,* reflecting the expected changes and results of your intervention
- Measures: how you will measure progress toward goals and outcomes

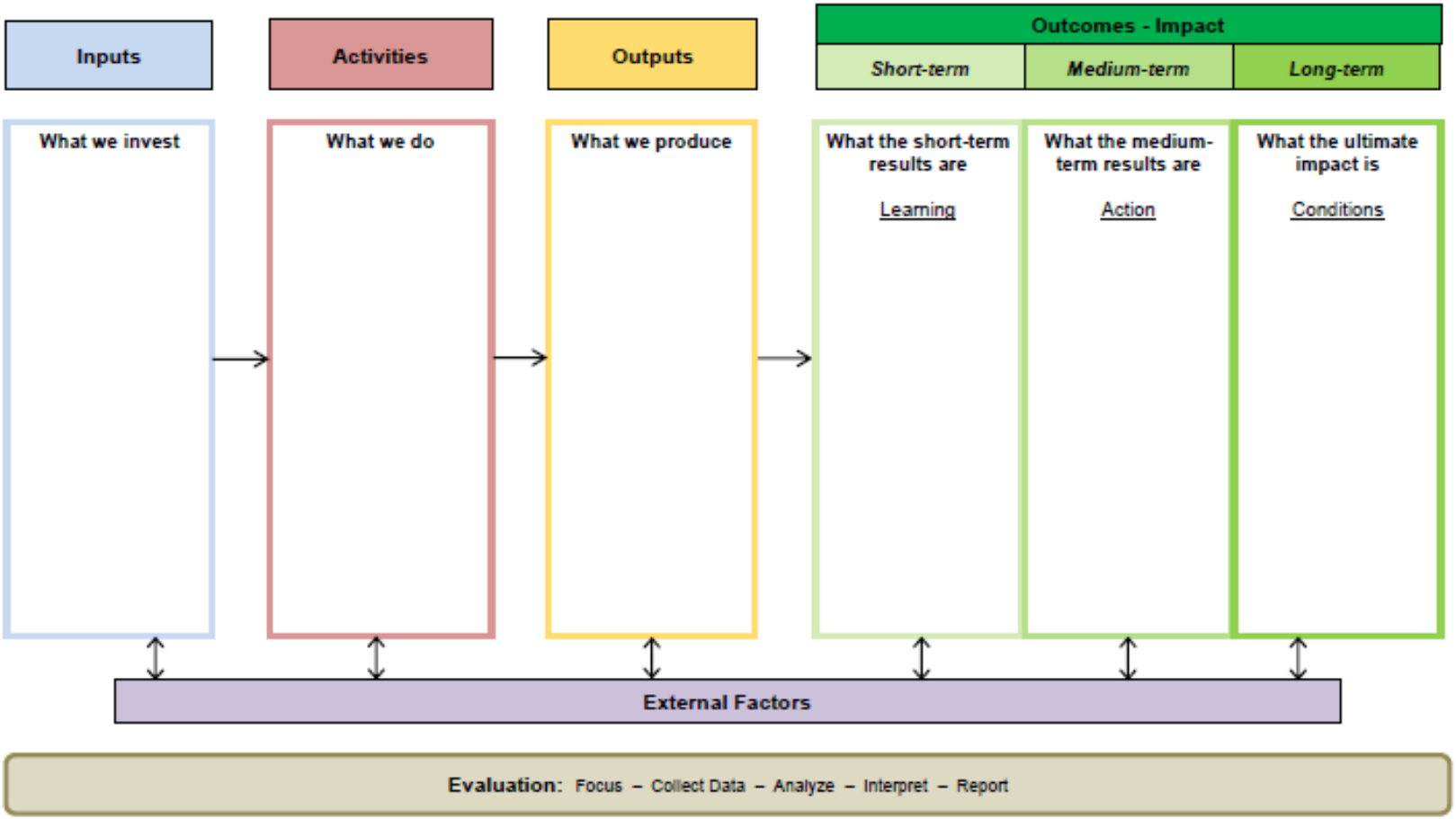
You can find more information on logic models, including templates and examples here: http://www.uwex.edu/ces/pdande/evaluation/evallogicmodel.html. There are many different options for developing a logic model or conceptual framework; the basic idea is that they provide a graphic representation of your plan, your goals, and the items you will evaluate to help you think more clearly about your process.

Use Worksheet 2 to develop your own logic model.

Worksheet 2: Developing Your Logic Model

As you develop the model, reflect on the following questions:

1. ***Meaningful:*** *Does the logic model represent or address what you want to achieve?*
2. ***Comprehensive:*** *Does the logic model make sense? Are activities leading to the desired outcomes?*
3. ***Feasible:*** *Is the logic model doable? Are the activities and outcomes tangible?*



Develop Evaluation Questions

When evaluating AT/IT initiatives in your school or district, you will generally focus on two types of evaluation: formative and summative. Formative evaluations address the question "How is it going?" whereas summative evaluations address "What did we accomplish?" Your questions will be driven by the goals, objectives, and targeted outcomes of your specific technology program, as well as any requirements of your state, district, or funding agency. As you develop your questions, think in terms of "sweet tweets"—at the end of the evaluation, what do you hope you are able to say (or tweet) about your technology initiative?

Goals and Requirements. The first step in developing your evaluation questions is to review the goals and desired outcomes of your initiative or program. When reviewing these goals, use the technology plans and your answers on Worksheet 1 to help you figure out what you would like to know about the program, as well as what other key stakeholders (e.g., state leaders, funding agency, school board, parents) are interested in knowing about the initiative.

- How do teachers perceive your new tech-focused professional development program?
- How is technology being integrated into the existing curriculum?
- How often are students using the technology tools in their learning?
- When and how are AT/IT tools being used with students with disabilities?

What goals do you want to see accomplished? What goals do others want to see accomplished? How do you know if you're accomplishing those goals? If you were not part of the original planning process for technology implementation, you may need to talk to key stakeholders and decision makers to identify what others want to know, review requirements from the funding agency (if applicable), and read through available technology plans and initiatives to create a list of goals that should be measured. Many grants come with requirements and contractual obligations (e.g., funds must be used to address students with high need), so be sure that your evaluation questions address your achievement of those goals. Be sure to note any reporting requirements or specific data that must be reported to the state, district, or funding agency.

Outcomes. After you have identified the goals, objectives, and requirements associated with your technology initiative, think about how you will get to answers about outcomes. Whatever questions key stakeholders have about a technology initiative, whether the initiative has produced measurable outcomes is likely to be pretty high on the list. In developing your evaluation questions, you'll need to ensure that you're thinking about questions that address whether

- the presence of technology in the classroom has increased the quality or quantity of student work,
- professional development activities have changed teacher behavior and teaching, or
- technology supports have shown improved outcomes for students with disabilities on standardized tests.

Questions that relate to impact take longer to answer than questions about whether the program is being implemented, how many teachers have successfully completed a professional development program, or whether students are receiving assistive technology supports and services in each of their classes. Each type of question is important and helps you gain a clear picture of your technology initiative, as well as what is working and what needs tweaking. The long-term outcomes for students will be of most interest to policy makers and funding agencies; measuring the short-term outcomes and using that information to drive improvement of your program will help ensure your initiative is successful.

Use Worksheet 3 to help you develop evaluation questions that address the initiative's goals and objectives.

Worksheet 3: Developing Your Evaluation Questions

What do you want to know?

What do other stakeholders (e.g., teachers, administrators, parents, funding agencies, state and district leaders) want to know?

List goals and the questions you'll ask to address those goals.

Goal	Evaluation Question to Address Goal

Design Your Evaluation

Begin by thinking about the evaluation questions you've developed: What evidence will you need to answer those questions? What evidence will others be looking for? The type of information you'll need may vary from study to study, and may be qualitative, quantitative, or both. Qualitative data could include narrative observations of the ways in which students are using computers in the classroom, or a description of an initiative. Quantitative data may include items such as number of technology devices available (i.e., iPads), number of professional development hours provided, or how much time students spend using a particular piece of software. Collecting both types of data can provide you with a clearer picture of how your initiative is working; observations of how students use technology, combined with the amount of time they use technology, can give you a better understanding of student technology usage than either piece of data alone.

The type of evaluation design you choose will depend on the types of questions you are trying to answer, and will be driven by your available resources (e.g., staff, time, available data to measure outcomes) for evaluation activities, and whether you're conducting a formative or a summative evaluation (see Table 1).

Table 1. Formative Versus Summative Evaluations

Formative Evaluation	Summative Evaluation
• Are we meeting goals and accomplishing activities we set out to accomplish? • Are we on target with our planned timeline for implementation? • What problems need to be addressed? What can we do to fix issues with implementation?	• Did we accomplish our goals? • Did our intervention contribute to the achievement of our goals?

Formative Evaluations

When conducting a formative evaluation of your technology initiative, you will focus on identifying areas of success; challenges to the integration of a particular technology tool, device, or service; and difficulties with implementation. These types of evaluations can help during the early phase of the technology implementation process to highlight what is working and what is not, as well as roadblocks that teachers or students encounter when using the technology. For example, prior to a wide-scale implementation of a new technology initiative, you might start with a small group of potential users (students or teachers) to develop trainings for teachers and students, test different approaches, and identify possible issues before rolling out a larger schoolwide or districtwide implementation. By identifying potential barriers early, your school or district will have the opportunity to rectify them before investing in a full implementation effort. Properly addressing flaws or training needs before the technology goes into every classroom can save time and money as well as increase teacher and student satisfaction and the likelihood that technology will be integrated rather than abandoned.

This type of evaluation examines process over product; you might address the following issues:

- Rollout of new equipment: Did this go as planned? Was all equipment/software received on time?
- How many teachers participated in professional development activities? What skills did they learn? What worked well? What didn't?
- Is technology being used in the classroom as planned?
- Are students using the technology as intended?

Advantages of Formative Evaluations

- Catch issues with implementation early in the process
- Guide midcourse corrections to the implementation process
- Evaluate technology implementation process to better understand later outcomes and improve program management
- Collect baseline data for use in future summative evaluations and to identify research questions for further study

Summative Evaluation

Summative evaluations assess program outcomes. To determine the relationship of different factors to outcomes, similar to formative evaluations, some information used in summative evaluations is collected early in the life of a program (e.g., baseline data, test scores). Unlike formative evaluations, however, a portion of the information is collected after the program has been implemented completely and adequate time has passed to expect outcomes to occur. Some examples of questions for a summative evaluation might include the following:

- Did teacher technology skills improve as a result of professional development activities?
- Are teachers using technology more frequently in their instruction?
- Did technology improve targeted student outcomes (e.g. reading proficiency, time on task, mathematics skills)?

Advantages of Summative Evaluations

- Help identify cause-and-effect relationships
- Assess long-term impacts of a technology initiative
- Provide data on change over time

Develop a Plan for Collecting Data

Before identifying data collection strategies, it will be useful to know what data sources are available, and what additional data you may need to collect. You will want to identify the instruments or data collection tools you will need and determine whether they will need to be developed, a schedule for data collection, and any training or materials that might be required for those collecting data. Other key considerations include mechanisms for ensuring accuracy of data (Who will enter data? What checks will be in place?) and how and where data will be stored.

One activity that can help with determining what kind of data must be collected is to return to your logic model and the goals for your technology initiative. The goals, inputs, and related activities you mapped out in your logic model can help guide the type of data you'll need to collect. For each of your goals, you'll have specific indicators, benchmarks and measures for tracking progress towards meeting the goal.

For example, although you may have a few goals for your new technology program, your ultimate goal may be to improve student reading outcomes, particularly among those with disabilities. To meet this goal, your district has purchased a new reading software package with many supportive features geared toward students with disabilities. However, the desired change in student outcomes is not as simple as "technology tool + student use = better reading achievement." Many steps and process goals along the way will contribute to your outcome goal: You may decide to purchase laptops for every student as part of your initiative, you may need to upgrade your wireless infrastructure, teachers will need to receive sufficient training in effectively integrating the tool into their teaching, and students must receive training in using the tool independently. In this instance, the process goals focus on access to technology, classroom integration, and professional development, whereas the outcome goal is an increase in student reading achievement. Each goal is important and must be evaluated, with indicators, benchmarks and measures identified.

Table 2. Indicators, Benchmarks, and Measures

	What Is It?	Key Features	Examples
Indicator	Statement that reflects specific goals; used to gauge progress The piece of information that measures whether outcomes are being achieved	• Is clearly related to the outcome and is a measurement of the outcome • Usually includes number (percentage, average, total) to track to see whether it goes up or down • States whether you want to see an increase or decrease • Discusses how you will measure the outcome • Is feasible given the resources and data available	• An increase (*direction*) in the average score (*number*) on the reading test given at the end of the literacy software intervention (*method of measurement)*
Benchmark	Specific target; what the program is trying to achieve	• Can be either incremental or a final target • Consider resources available to the project • Based on baseline or starting point data	• Within 2 years of implementing the literacy software intervention, student scores on the state reading assessment will increase by 10%
Measure	Item reflecting the information needed to answer a research question, inform an indicator, or determine how close one is to achieving benchmark	• May be represented as percentages or ratios • Similar to indicators, but more concrete and specific • Answer what data you'll need to collect to assess your indicators	• Standardized test scores

This information will help you craft your plan for data collection, as well as identify what data you will need to collect and what system you will use for recording the data. Types of data you might want to use include counts of participation (in training activities), surveys, interviews, focus groups, direct observations, and extant data. Timing of data collection also should be an important part of your plan: When would you expect a measurable change in outcome? What are the time frames for existing data collections (i.e., state assessments)? What are the key points during the implementation of the strategy, activity, or intervention? Will you need a pretest and posttest?

Your evaluation team will need to consider

- **how** data will be collected,
- **who** will data be collected on (target population),
- **when** data will be collected, and
- **how** you will use the information from your evaluation to make modifications to the technology initiative (feedback loops).

As you finalize your plan for data collection, ensure that you factor in the following:

- Collection of baseline data (e.g., initial reading or mathematics scores): Starting point data will help you set benchmarks. You can't know how far you've come if you aren't sure where you started.
  - Example: student achievement data
- Data from multiple sources: Having multiple sources of information and data can help you be more certain in your conclusions.
  - Example: surveys of teachers who participate in training
  - Example: direct observations of student learning
  - Example: student outcome data, including that collected/provided by the technology tools you're using
- Size of your sample: For a variety of reasons, you may not be able to collect data from everyone (e.g., all schools in your district), so you may need to collect data from a subset of students or schools.
- Comparison groups: Determine whether you will compare one group of students or teachers to another, and if so, what information you will need to collect.
  - Example: comparison of students across grade levels and across schools

Use Worksheet 4 to guide your efforts to map out your goals, indicators, benchmarks, and related measures.

Worksheet 4: What Data Will We Need to Collect?

Goal	Indicators	Benchmarks	Measures

Develop a Plan for Data Analysis

Your analysis plan will help with mapping out how data will be analyzed, and ensure that the collected data is aligned with the evaluation questions. Your analysis plan should include information on

- evaluation design,
- method of data analysis,
- instruments and data collection strategies (e.g. surveys, observation protocols, interviews, focus groups, school records, test scores,
- collection and organization of data, and
- creation of data displays of results.

You will need to ensure that the instruments and data collection strategies you are using are rigorous and align with the evaluation questions, and that you have enough data to make the kinds of conclusions about outcomes that are of interest. In addition, be aware of what type of analysis the data you collect will require. As you develop your data analysis plan, consider the following questions:

- How will the data be entered and retrieved?
- How will you aggregate data—by program, region, provider type?
- How will you summarize (average, percentage)?
- How will you know your data are of adequate quality (e.g., response rate, representativeness, pattern checking)?
- Will statistical knowledge and software be required? Or can data be represented in terms of percentages (e.g., 55% of teachers found the training useful)?
- Do you have resources available to review and code multiple narrative responses to find themes?
- How will you collect data and who will be responsible for analysis?

If you have existing data sources, your need for complicated analysis may be reduced, although existing data sources may not answer all of your questions. If you don't have the staff time or expertise to conduct more complicated analyses, this may be an area where you might want to recruit an external expert to help you.

Draw Conclusions and Communicate Results

Once you've collected and analyzed your data, it is time to use it to draw conclusions that you can communicate to your stakeholders. Begin by returning to your original goals and evaluation questions—what were you hoping to learn in the first place? Using the chart of goals, indicators,

benchmarks, and measures, start organizing your data according to your original goals—list the data you have that corresponds to each measure and addresses each of your goals. The most important aspect of your data analysis will be this step: taking the information you've gathered; aligning it to your original questions and goals; and drawing conclusions about your process, the achieved outcomes, and what can be done in the future. This stage is when you are rewarded by your hard work in the earlier stages. Vague goals such as "teachers will receive sufficient training" would be difficult to draw conclusions about. But if you've done the work of identifying benchmarks and indicators, you'll have a better sense for what would be considered "sufficient" or "adequate."

Once you've drawn conclusions about your technology program and its outcomes, you'll need to communicate these results to your stakeholders. Think about which audiences you'll need to share information with, and how often you'll communicate. For example, you may share results with key stakeholders (e.g., funders, parents, teachers, school board) several times throughout the school year as you collect preliminary data, or as you see results from formative assessments, sharing what is working, what hasn't been working well, and asking for feedback on strategies for improvement. The ways in which you communicate these results will vary according to audiences—your funding agency may have very specific requirements for reporting, whereas you'll need to develop specific parent- or teacher-facing materials that clearly communicate what was learned. Think about who you need to share information with and the ways you'll share it (i.e., school board meetings, newsletters, e-mails to parents, press releases to local newspapers) and plan for how you'll disseminate this information, gather feedback, and incorporate feedback and suggestions into future refinements to your program.

Use Your Results to Improve Your Program

Now is your opportunity to drive change and keep improving your technology initiative. You now likely have a better sense of what worked well and what didn't, and have identified needs for more staff, training, technology tools, or resources. The goal of an evaluation is never to finish up, say "Everything worked great," and walk away; the information and evidence you've gathered gives your team insight into what to do next and how to keep improving your program. These changes take time, and any large-scale initiative will likely move slowly, but the steps you've taken in evaluating your technology program can help keep the momentum going and the project moving forward.

The success or failure of the technology initiatives in your state or district will depend upon teamwork; involvement of stakeholders; careful planning; and ongoing research, evaluation, and progress monitoring as a mechanism for continuous improvement. Technology initiatives, like any educational initiative, are not "set-it-and-forget-it" projects. If we hope to achieve improved learning outcomes for students with disabilities, data that drive decisions and help us better understand what works best for who and under what conditions are essential. The end goal of every evaluation of a technology initiative should be to drive continuous improvement—strengthen what's working, shape what isn't—and build a technology initiative that drives

improved student outcomes for all students.

With your team, look at the initiatives under way in your state, district, or school and those planned for the future: What is working well? What isn't working? How do you know? Do you know the ways in which your initiatives are driving improvements in student outcomes? Are you getting the results you were expecting? Why or why not? Is your implementation working? What needs to change? In the final analysis, evaluations matter because they provide state and district leaders the information necessary to align student needs with appropriate technology interventions to support their learning.

Suggested Resources for Going Further

Innovation Network Evaluation Plan Workbook:
http://www.innonet.org/resources/eval-plan-workbook

The Program Manager's Guide to Evaluation:
http://www.acf.hhs.gov/programs/opre/research/project/the-program-managers-guide-to-evaluation

We Did It Ourselves: An Evaluation Guide Book:
https://www.sierrahealth.org/assets/files/other_pubs/WDIO-Evaluation-Guide-Book.pdf

Taking Stock: A Practical Guide to Evaluating Your Own Programs:
http://www.horizon-research.com/taking-stock-a-practical-guide-to-evaluating-your-own-programs/

Logic Model Development Guide:
https://www.wkkf.org/resource-directory/resource/2006/02/wk-kellogg-foundation-logic-model-development-guide