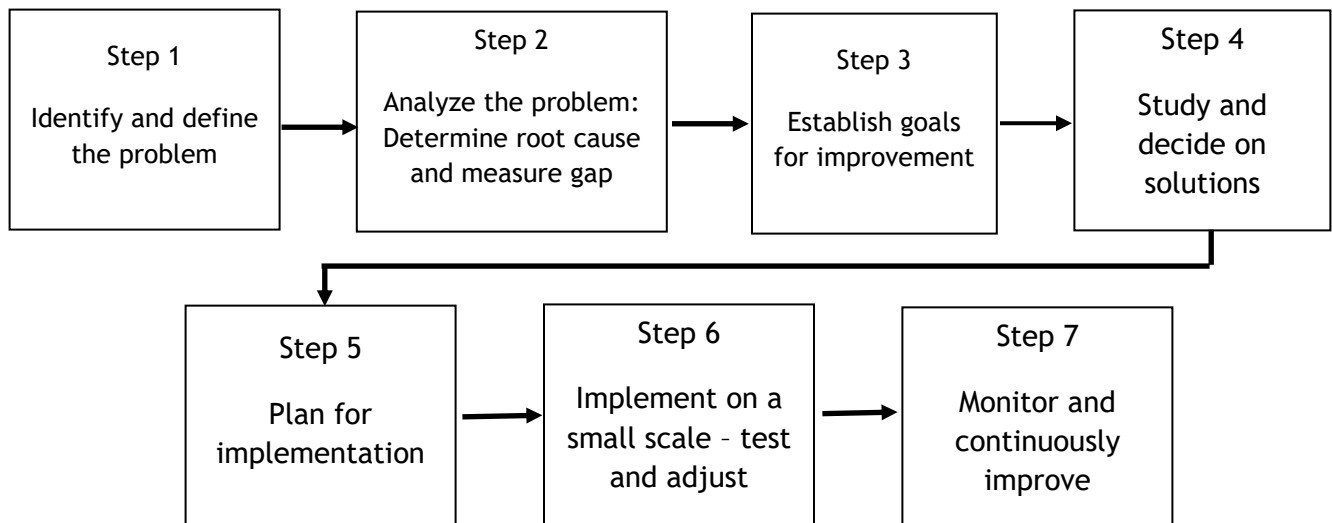# A Problem-Solving Process

When a problem has been around for a long time, and previous efforts to resolve it haven't resulted in sustained improvement, it may be worth the time to dig deeply into its causes in order to develop a more systemic long-lasting solution. In these cases, a group of people who understand the problem(s) and the process (because they work with it every day) is convened to address and resolve the problem at a deep level (Level 2 or Level 3 fixes).

The challenge of solving problems in groups is that most of the people in the group are there because they already have a solution in mind. They come to the group with preconceived notions about the problem — what it is, how bad it is, and how to fix it. What typically happens is that the group jumps right into arguing about which solution is best before it has taken the time to really define and understand the problem from all the angles. This approach is ripe for conflict and disengagement.

An effective team will talk about the process it intends to use to attack the problem. A methodical, easy-to-understand process unfolds naturally and moves the group through a logical progression of thinking. The process engages all participants and helps the group investigate the full spectrum of the problem. The 7-Step Problem-Solving Method is just such a process. Note that throughout this process, data should be collected, analyzed, and interpreted to be sure that the right problem is being solved with the right solution.

Step 1 Identify and define the problem	Step 2 Analyze the problem: Determine root cause and measure gap	Step 3 Establish goals for improvement	Step 4 Study and decide on solutions

Step 5 Plan for implementation	Step 6 Implement on a small scale – test and adjust	Step 7 Monitor and continuously improve

The 7-Step Problem-Solving Method

Step 1. Identify and Define the Problem

Step 1 is to develop a collective understanding of the problem. Problems often manifest themselves in different ways throughout a school. Each person who works in the school may experience the problem in a unique way. When problem-solving in groups, it is important for each person to have the opportunity to describe the problem from his or her perspective. This will assure that the group understands the whole problem, not just one or two pieces of it.

If you are facilitating or leading your team, first have the group discuss what they think the problem is, where the problem occurs, who sees it as a problem, how often it occurs, and what aspects of quality are in jeopardy as a result of the problem. Use data as much as possible to confirm (or disprove!) what people think is happening. Once you start using data regularly, you'll be surprised at how often everyone's perceptions (including your own) can be inaccurate.

The following questions and guidelines can help define the current state of the situation:
- What is the problem we're attempting to solve?
- In what areas does the problem occur most often? (Collect data.)
- For whom is this a problem and how bad is it? (Collect data.)
- How often or how much does the problem interfere with student learning?
- What's at stake if we don't solve this problem? What's at stake if we do solve this problem? (Collect data.)
- How did we come to have this problem? What is the history? (Consider using the Historygram process when examining these questions.)
- Once the current state is well understood, take time to ask and answer the following questions: What do we want to be different after we solve this problem? What is the desired state we would like to achieve?

In addition to listening to each other, the group may want to ask their colleagues in the school or community to verify or extend their thinking about the problem.

The process of identifying and defining a problem can be lengthy and challenging, especially if the group is diverse and each person experiences the problem quite differently. Too often when teams set out to solve a problem, they end up with a Band-Aid approach because the real, whole, and underlying problem is not detected.

Tip

Beware of solutions in disguise! Sometimes problems are stated as the opposite of some desired solution. For example, the statement "We don't have enough computers" is a problem statement that poorly disguises the speaker's preferred solution ("Buy more computers!"). If you hear solution-oriented statements, ask the speaker what benefit would come from implementing the (disguised) solution: "How would having more computers help us?" Once you've identified the underlying problems, you may find other solutions that might work just as well, be less expensive, or be better for more people.

Be patient with learning as much about the problem as you can before attempting to define the problem too narrowly. The time you spend up front in the definition and identification phase could save you huge amounts of time later on in the process.

Writing a Problem Statement

Once your group has learned about the ways in which the problem manifests itself, write a simple, concise statement that captures the essential elements of the problem being addressed. A problem statement should
- Be objective and factual – not imply a solution
- Identify key characteristics of the problem such as:
  - Where and when it is and is not observed
  - Extent or impact it is having on student learning
  - Observable evidence of its existence
- Be relatively short
- Identify the problem at its deepest level of manifestation
- Identify for whom this is a problem and when

Example: This is the third year in which more than 60% of our sixth graders and 40% of our seventh graders have received warning reports for potential failures due to incomplete homework after the first 6-week grading period (current state). We want our junior high school students to be able to successfully complete their homework assignments and turn them in on time (desired state).

When everyone is clear about what problem the group is solving, you can then begin to analyze why you think the problem is occurring.

Step 2. Analyze the Problem

It is important at this stage that all individuals have the same information concerning the problem and understand it in the same way. Analyzing the problem for root causes and gathering additional data about the problem provides a deeper understanding. There are four key questions your team should answer:

- *Why* is the problem occurring?
- *Where* is problem occurring?
- *How big* is the problem?
- What are the *biggest drivers* of the problem?

Why is the Problem Occurring?

The first level of analysis is to determine why this is a problem and why the problem exists. Use 5 Why's Analysis and/or cause-and-effect diagrams to dig deeper and deeper into root causes of the problem. Be careful – these tools identify potential root causes. You will need to verify them with data or experimentation. You will be using the "logic-data chain" throughout the problem-solving process, as you theorize about what is going on, gather data to verify your theories, and then theorize again about what may be causing the problem, gather data again, and so on.

> **Example**: The problem statement identified a problem with middle school students not completing and handing in their homework. The group already knew how many and which students were having the problem but they didn't know what was causing the problem or what impact the problem was having on student learning. After conducting a cause-and-effect analysis, they might suspect that the way in which these students organize their materials and the many different ways in which their teachers give homework assignments were two areas that should be studied further.

Where is the Problem Occurring?

Flowcharting the processes in which the problem is evident will help the group pinpoint where in the system to look for potential solutions. Flowcharts are pictures of how work flows

over time. Regardless of what type of flowchart you choose, the first step is to determine the scope of the process you will be depicting. Where does it start? Where does it end? Once you've determined those boundaries you can begin to identify the steps and their sequence.

> **Example**: The group studying the middle school students with homework problems has several alternatives. They could work with the students to create a detailed flowchart of all the steps in the process from the time assignments were given until the homework was turned in. Or the group could also use a flowchart to chart how each teacher assigns homework (and identify ways to standardize the process to make it easier for students to successfully organize and complete their assignments). A third alternative is to create a flowchart that depicts the process used by students who don't have trouble getting their homework in on time. Such a chart could show steps that other students could use.

How Big is the Problem?

The team needs to gather data to show how big the problem is — how often it occurs, what impact it has, etc. The important thing is that the team decide what the most important "gap" or need is and then gather data to measure the extent of the problem in relation to that need. Many of the snapshot data tools can help answer this question.

A subset of this question is whether the frequency or impact of the problem is changing over time. Here, run charts or control charts are essential.

> **Example**: The team already knew that 60% of the sixth graders and 40% of the seventh graders have demonstrated the homework problem for each of 3 years. The team might also want to know if those percentages change during the year; if there is a correlation between homework assignment completion and test results, the type of assignment, the level of support at home, etc.; or if there are common demographic profiles of students who struggle with homework, such as attendance, enrollment in special services, behavioral factors, after-school employment, etc.

What are the Biggest Drivers of the Problem?

Sometimes a problem can't be addressed by a straightforward cause-and-effect approach because the potential causes are intricately linked. In such cases, asking about the big drivers

can help identify the root causes. A relations diagram is useful for answering this type of question.

Step 3. Establish Specific Goals for Improvement

As mentioned in earlier chapters, problem-solving goals should meet SMART criteria. The team's definition of its goals will relate directly to its purpose and to the problem it is attempting to solve. If the group is working on more than one problem, it will have more than one goal. There may also be multiple goals for one problem, especially if the analysis step has unearthed more than one potential root cause and/or more than one major area of gap or need.

Step 4. Study and Decide on Solutions

Throughout the course of its problem-solving, your team will have begun the process of identifying possible solutions. This is the point where the ideas that have bubbled up from the process are pulled together and enhanced. First, go back through your meeting records and find the ideas that you've already generated. Then brainstorm and discuss additional ideas. That way, you can be sure to start with a list that both respects people's original ideas and what the team has learned through its efforts up to this point.

From Options to Solutions

Typically, a team will generate many potential solutions to the problem(s) being studied. Narrowing the ideas down to a manageable few can be a real challenge for some groups because it is the part of the problem-solving process that often has the most emotion attached to it. The challenge is less for teams that have diligently included all members along the way and have done a good job of collecting and analyzing information about the problem. For such teams, deciding on the solution is seen as just another step, not a point of conflict.

One way to narrow the ideas is to look for research to identify promising practices in the area of concern. Another option is to develop a set of criteria relevant to the decision you face. Some criteria the group may want to consider are
- No or limited lost instructional time
- Extent to which a wide variety of students will benefit
- Doable in terms of time, energy, and financial resources required

- Equitable
- History of positive results

The group should decide on the criteria together and then match each idea to each criterion to find the best fit. A decision matrix can help you keep track of the criteria your team is using and how each potential solution matches those criteria.

Documenting Your Proposed Solution

Once your team has decided on the solution it will propose for the problem being studied, you need to document both what the solution is and why that option was chosen (that is, how well it fits your criteria).

Step 5. Plan for Implementation

Planning tools and templates can help the team reach conclusions in ways that will ultimately facilitate implementation and garner collective support for the team's recommendations. Before you finalize the implementation plan, your group should ask itself the following questions:

- Who will be affected if this decision is implemented?
- Who will be responsible for seeing that it is implemented?
- What are the important tasks or actions that must be taken to assure successful implementation?
- Who should do each task and when?
- What skills will these actions require? Do the people who will need to implement the decision or solution have those skills?
- Do the people who must implement the change believe change is needed?
- How will we know if we have been successful? How will we measure our progress? When should we measure our progress?
- What resources will be needed to do this well?

An implementation plan should address each of the questions raised above, providing ways to involve and communicate with everyone affected by the change. The plan should also reiterate the team's mission. Clearly stated tasks, doable time frames, reasonable costs, and lots of involvement on the part of those who must ultimately accept and perform the change will all help to facilitate effective implementation.

Step 6. Implement on a Small Scale

This is the step that most teams miss. If at all possible, test your solution(s) and implementation plan on a small scale and get feedback from those who are implementing it to see if it's manageable and productive. This is the essence of the PDSA cycle. The plan doesn't have to be implemented for a long time (such as a year-long test), but should be tried for a sufficient period to gather enough data to see whether it works. If it does seem to be manageable and working, implement the solution broadly. If it isn't working, find out why and either make adjustments or try a different strategy.

Step 7. Monitor and Continuously Improve

Continuous improvement is driven by repeated application of the PDSA cycle, each time working with larger scales or longer time periods. Initial improvements are sometimes the result of a halo effect: improvements appear to be working simply because people are paying attention to the problem. Therefore, build in a long-term mechanism for monitoring results to assure that improvements are both real and sustained. Then, as the solution becomes the new way of operating, it can be incrementally improved again and again.

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