

Fishbone—Cause and Effect Analysis Protocol

Root Cause Analysis (RCA) has been in use in the business world to solve problems in many areas:

- Safety-based RCA in occupational safety and health.
- Production-based RCA in quality control in manufacturing.
- Failure-based RCA in failure analysis in engineering and maintenance.

Systems-based RCA has emerged as an amalgamation of the preceding business sectors, along with ideas taken from fields such as change management, risk management and systems analysis.

Principles of Root Cause Analysis

- Aims performance improvement measures at root causes which are more effective than treating the symptoms or factors that may contribute to a problem.
- To be effective, RCA must be performed systematically with conclusions that are backed by documented evidence.
- There is usually more than one potential root cause for any given problem.
- To be effective, the analysis must establish all known causal relationships between the root cause(s) and the defined problem.

Root Cause Analysis can be applied to almost any situation. Determining how far to go in your investigation requires good judgment and common sense. Theoretically, you could continue to trace root causes back to the Stone Age, but the effort would serve no useful purpose. Be careful to understand when you've found a significant cause that can, in fact, be changed.

There are three basic types of causes:

1. **Physical causes** – Tangible, material items failed in some way.
2. **Human causes** – People did something wrong, or did not do something that was needed. These causes may lead to physical causes.
3. **Organizational causes** – A system, process, or policy used for decision-making or to do the work of an organization is faulty.

Root Cause Analysis looks at all three cause types. RCA involves investigating patterns of negative effects, finding in-depth challenges/problems of the system, and discovering specific actions contributing to the challenge/problem. This often means that RCA reveals more than one potential root cause.

There are two fishbone diagrams to use with this protocol. The first is a basic fishbone diagram that allows users to enter causes in any position on the diagram. The second diagram can be more restrictive because it is designed to place category labels to help organize the information as it is entered on the diagram.

In order for all involved to understand how to complete the Fishbone, it is suggested that a facilitator model the root cause process using the attached EL example or one from your own school data. Divide your school teams into focus groups based on your highest priority challenges/problems with experts for the content of the concern. Each group would require a facilitator to fill out the fishbone based on their group's input of factors and causes. This will allow a school to address multiple instructional challenges/problems simultaneously.

Steps to Complete Fishbone (*basic diagram*):

1. Define the challenge/problem.
 - a. Select instructional challenge/problem based on prioritized needs.
 - b. Describe challenge/problem in the “fish head” on right hand side of diagram.
2. Team members brainstorm causes for the defined challenge/problem. For each cause considered for inclusion on the fishbone diagram, ask the following questions to ensure the “cause” is supported by evidence.
 - What proof do I have that cause exists?
 - Is it concrete?
 - Is it measurable?
 - Do I have at least two sources of data to suggest the cause exists?
 - Did you identify your priority concerns based on data?
 - What proof do I have that the cause actually contributed to the problem I’m looking at?
 - Even given that it exists and could lead to this problem, how do I know it wasn’t actually something else that caused problem?
 - What proof do I have that cause could lead to the stated effect?
 - Am I merely asserting causation?
 - Is there research evidence suggesting the cause will result in stated effect?
 - Ask, “If . . .(cause) . . ., then . . .(effect) . . .”
 - Is anything else needed, along with this cause, for the stated effect to occur?
 - Is it self-sufficient?
 - Is something needed to help it along?
 - Can anything else, besides the cause, lead to the stated effect?
 - Are there alternative explanations that fit better?
 - What other risks are there?

Be sure to list all factors and suggested causes related to the problem.

3. Label each one either “S” for student or “A” for adult, based on whether the factor is based on student or adult action (or lack of action)
4. Label each one “I” for In Our Control or “O” for Out of Our Control. Cross out all the “O” factors.
5. Determine if control is at the district, school, or classroom level. Cross out all potential causes whose control is centered outside the school.
6. Double check to be sure that the factors left have **at least two sources of data** to back them up. Be aware that the data may tell you a different story than what you had thought and also, that you may find data that create another factor to add to your fishbone
7. After completing the Fishbone (Cause and Effect) Diagram, the team will complete these tasks:
 - a. Find themes repeated within or across categories.
 - b. Rank order the causes that the team can directly change based on the impact that each cause has on the identified key challenge or effect.
 - c. Multiple causes will require the school to select one that will have the greatest effect on eliminating negative “root causes.” Make sure the school has the capacity to change the identified root cause.

Steps to Complete Fishbone (*restrictive diagram*):

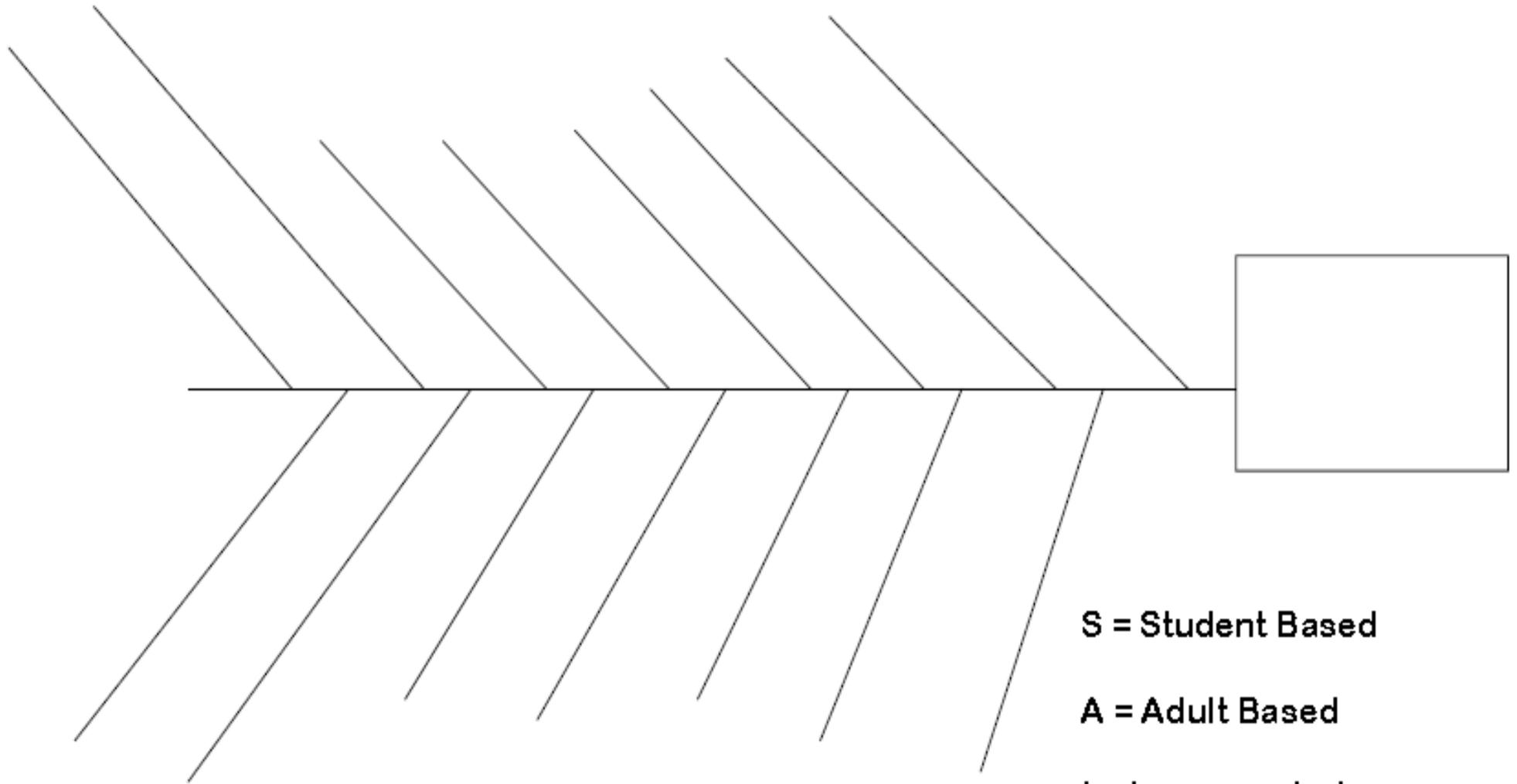
Between steps 1 and 2 for the basic diagram, label the five available categories label boxes with appropriate descriptors for the identified instructional challenge/problem.

Potential categories might include:

- Curriculum
- Instruction
- Assessment
- Equity
- Professional Development
- School Culture
- Classroom management
- Data System

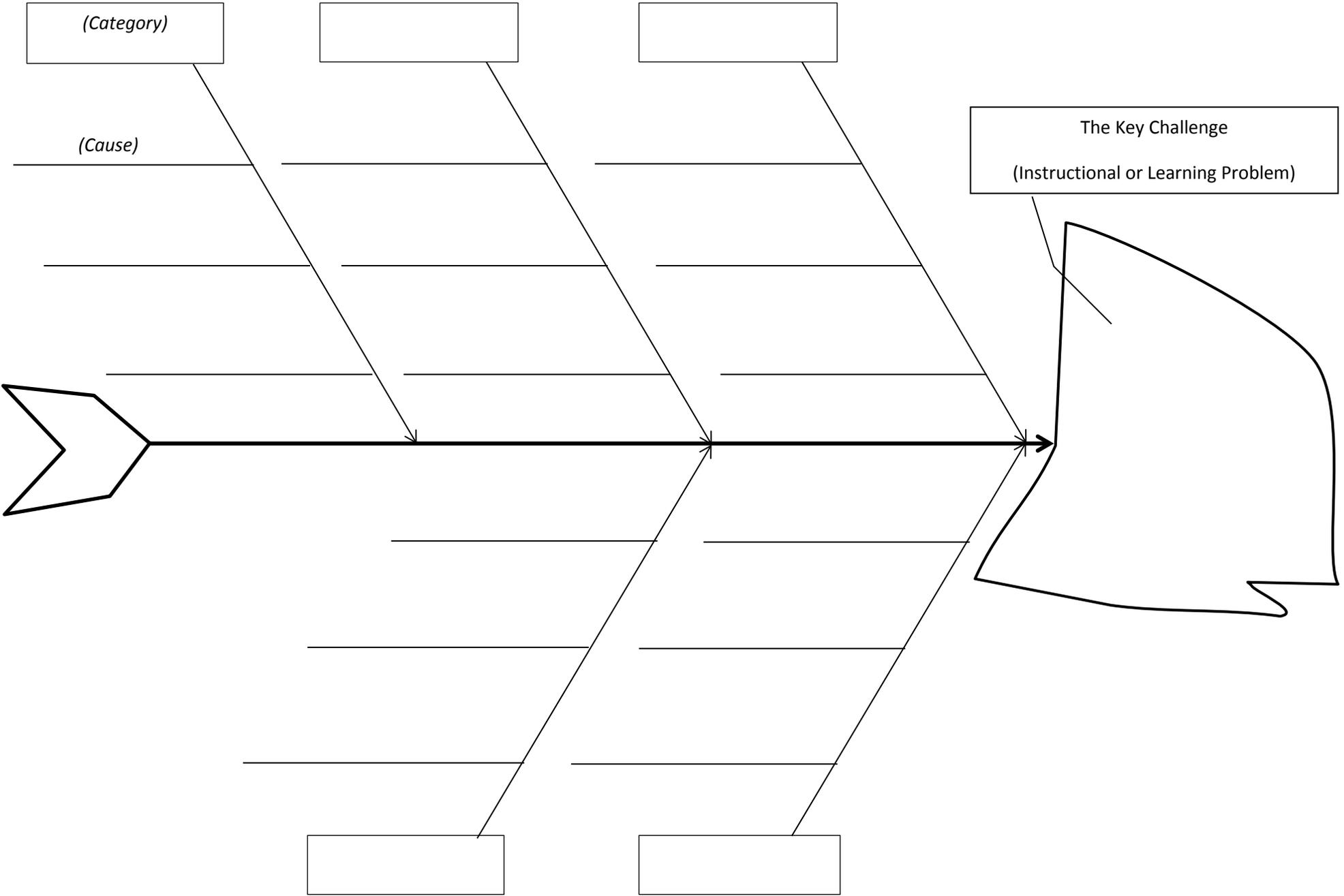
This helps the team identify and organize various driving factors within members' control as they complete step 2. It also eliminates the need to complete step 7(a).

Cause and Effect (Fishbone) Diagram



- S = Student Based**
- A = Adult Based**
- I = In our control**
- O = Out of our control**

Fishbone Restrictive Diagram
Find the Root Cause



Example

Fishbone (Cause and Effect) Diagram
Find the Root Cause

