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Good Teaching in Action

## How to Be an Education Troubleshooter

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**The Internet now makes it possible to capture and disseminate the collective expertise of educators to improve learning.**

The next time your car is making a mysterious sound, you might want to go online and check out *AutoZone.com*. Developed by the AutoZone automobile parts company, this website offers a searchable troubleshooting guide—a database of car problems, likely causes, and suggested remedies.

The idea of an easily accessible database of common problems has immediate application to the teaching profession. Just as the *AutoZone.com* troubleshooting guide compiles years of diagnostic experience into a one-stop resource for addressing common car problems, online education troubleshooting guides can now codify predictable instructional rough spots and instantly offer tried-and-true solutions that are based on research and best practice. Educators in schools and school districts across the United States have begun to develop such guides.

Imagine the following two scenarios:

### Scenario 1

After a frustrating day trying to help her students grasp functions, a first-year algebra teacher logs onto the regional troubleshooting guide and searches the key words *Mathematics - Algebra - Functions*. She is directed to a Web page containing commentaries by high school mathematics teachers who have tackled the same challenge. An additional click reveals several proven strategies, lesson ideas, and companion resources for addressing the problem.

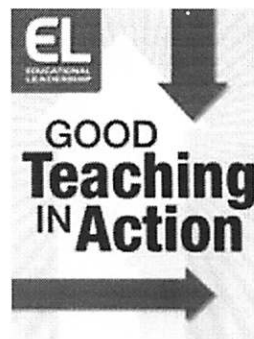
### Scenario 2

Four times a year on early release days, teachers in one school convene in designated classrooms to work in grade-level and subject-area teams. Working in pairs, they evaluate student work from common assessment tasks using a common rubric. Following the scoring session, the group members share their observations about student performance patterns, making notes of areas of students' strengths and identifying common performance weaknesses. Then they divide into subgroups to share practical ideas and resources for addressing the identified problem areas. They e-mail their recommendations to the school's designated troubleshooting liaison, who reviews the recommendations and posts the best ideas to the regional troubleshooting guide website that is accessible to all teachers.

## Why We Need Troubleshooting Guides

Although teachers are typically given curriculum binders, textbooks, and other resources to support instruction, what's often lacking (the missing manual) relates to the rough patches of learning. What areas have local and state-level assessments revealed as the biggest weaknesses in 4th grade reading? How do you teach a 6th grade student who still can't divide fractions even though he's been taught the skill in 4th and 5th grades? Why do many students struggle to write a cogent paragraph or a clear hypothesis after years of being asked to do both? What can you do to help students who give up the first time they encounter any difficulty?

Online troubleshooting guides can round out the information and teaching suggestions that textbooks and



traditional curriculum guides typically provide. Moreover, teachers can update on online database immediately as new ideas and resources become available, instead of waiting for a seven-year cycle to reprint written curriculum guides.

In *Schooling by Design*,<sup>1</sup> Grant Wiggins and Jay McTighe propose that a troubleshooting guide is a valuable addition to a curriculum because it provides timely support to teachers when their students experience learning difficulties.

The job of teaching is not to "execute" the paper curriculum irrespective of results, any more than it is the coach's job to execute the playbook irrespective of the score. The teacher's job is to flesh out the lessons in the curriculum and adjust instruction whenever needed to ensure optimal learning and performance. Given that purpose, teachers need a curriculum that provides troubleshooting advice and builds in opportunities to alter courses, as warranted.

## How to Develop Troubleshooting Guides

In developing troubleshooting guides, educators address four basic questions:

1. What are the common and predictable misconceptions, skill deficits, and performance weaknesses evident in specific areas of the curriculum?
2. What familiar attitudes and behavior problems interfere with student achievement?
3. What specific approaches, strategies, and resources have proven successful in addressing these trouble spots?
4. How might we share the wisdom of expert teachers with all teachers through a searchable online database?

To address these questions effectively, teachers need the following knowledge and skills:

- Solid knowledge of subject areas.
- An understanding of how students learn.
- Cultural awareness of their specific student populations.

In addition, schools need to provide the following conditions to support the development of troubleshooting guides:

- Systematic use of diagnostic and formative assessments.
- Time for teachers to meet for troubleshooting and the expectation that they will do so.
- A plan for collecting and disseminating the root causes of classroom problems along with practical advice for addressing them.

Not only is the final product valuable, but the *process* of producing and updating a troubleshooting guide offers a shared purpose for professional learning communities as teachers and administrators work together to identify, analyze, and address common learning problems. The collective expertise of the group mitigates the assumption that an effective teacher (or a motivated student) should be able to figure it out on his or her own.

Although educators ideally develop troubleshooting guides at the district, regional, or state levels, individual schools and teams within schools can also benefit from the process. Teachers of all subjects and at all grade levels are concerned about the learning problems that they face and are sincerely interested in finding ways to address these concerns. Through their shared engagement and mutual interest in improving student performance, teachers deepen their own expertise and sense of collective responsibility.

## Troubleshooting Guides in Action

We propose two types of troubleshooting guides that educators can develop collectively to enhance staff expertise and improve student achievement.

1. Troubleshooting curriculum-based problems.
2. Troubleshooting student learning problems.

### Troubleshooting Curriculum-Based Problems

Every subject in the curriculum includes certain topics and skills that challenge many students because the material is complex, difficult, or counterintuitive. The first type of troubleshooting guide delineates these instructional red flags that appear year after year.

Here's an example: Staff math specialists in Carrollton-Farmers Branch, Texas, are in the process of identifying the problem areas for every grade level across the mathematics curriculum. In their online curriculum maps, they are flagging these predictable problems explicitly so that teachers know what to watch out for before they even begin to teach a unit or course. Typically, curriculum maps are accessible online, either via a district Intranet (not open to the general public) or through an Internet site accessible by a password. A few schools and districts make their curriculum publically accessible online.

The guides are straightforward and informal; they clearly state potential problems related to specific concepts and skills. Figure 1 shows two sample red flags that the math specialists have identified for a major Algebra 1 curriculum-based problem, *students' inability to solve equations*.

The inclusion of red flags into each curriculum unit provides powerful clarity for educators as they design instructional plans and talk with one another at grade-level team meetings. These conversations provide powerful staff development, not only deepening teachers' content knowledge, but also enabling them to examine the effectiveness of various strategies and learning materials. In addition, the inclusion of the red flags reinforces the value of diagnostic and formative assessment as teachers look out for problems in student performance from the beginning.

### Troubleshooting Student Learning Problems

The second type of troubleshooting guide focuses on the behaviors and actions that compromise an individual student's ability to learn (and sometimes the teacher's ability to teach). The goal is to adopt a problem-solving mind-set in which educators work together to diagnose the root cause of a student's learning problems so that individual staff members can more effectively address those problems and evaluate whether the strategies they employ have the intended effect.

Here's an example: The Grand Island Public Schools in Grand Island, Nebraska, developed a powerful troubleshooting guide that they call a strategy bank (available at [www.gips.org/public/staff/differentiation](http://www.gips.org/public/staff/differentiation)). The curriculum directors of each of the core subject areas as well as specialists in gifted education, special education, English language acquisition, instructional technology, and staff development worked together to identify the most common learner problems as well as effective staff responses. Because they created the resource across a range of specializations, teachers can use the same tool for every student—a more streamlined approach than using different tools for students with different "labels" (ELL, gifted, special education, and so on).

Teachers can access this database whenever they are wondering how to address a problem or a pattern of problems exhibited in the classroom. Figure 2 shows the suggested responses for one common behavior, "Student doesn't use academic vocabulary as a part of everyday speech." Figure 3 shows more specific suggestions that are displayed when the user clicks on "Teach explicit strategies to help student integrate concept/word into natural use."

Whether teachers are awake at night brainstorming possible remedies or at school in a grade-level team meeting, the database opens up their thinking about the possible reasons for the behavior as well as offering a panoply of possible options and resources available in the district. Teachers are encouraged not just to access the database but also to contribute to it, so additional strategies, resources, and components are continually developed. What began as the brain child of a handful of leaders is quickly becoming the property of the whole staff.

The staff of Virginia Beach City Public Schools created another exemplar as part of the district's strategic objective to close achievement gaps, particularly for black males. The district created an online tool that includes a facilitator's guide as well as a locally produced video that captures the voices of students and staff members expressing the urgency of recognizing race as it relates to student achievement.

The tool also includes a Web-based interactive troubleshooting guide to enhance teachers' understanding of root causes of students' behavior, help them cultivate more positive relationships with learners, and close achievement gaps. Through extensive reviews of education literature, interviews with students, and dialogue with one another, the staff produced a database that describes observable problem behaviors in students, tells what each behavior looks like in the classroom, offers reasons why the behavior may exist (on the basis of student perceptions and education research), and provides recommendations. Figure 4 shows an example of the diagnosis and recommendations for one common problem, *lack of student engagement*.

## Solving Problems Together

Regardless of how long they have been in the classroom, all teachers face rough spots. Instead of leaving teachers to address those concerns alone within their individual classrooms, online troubleshooting guides provide spaces for teachers to build their collective expertise. As a profession, we can address common and predictable problems, enhance teaching effectiveness, and boost student learning.

Endnote

- <sup>1</sup> Wiggins, G., & McTighe, J. (2007). *Schooling by design: Mission, action, and achievement*. Alexandria, VA: ASCD, p. 55.

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