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Pre-Assessment: Promises and Cautions

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To ensure that pre-assessment is worth the time and effort, keep these principles in mind.

This article began with a conversation between two friends who had different perspectives on the use of pre-assessments. One of us reasoned, "Pre-assessment makes sense! Effective instruction should begin with a clear understanding of what students bring to the learning experience." The other asked, "But where's the evidence? There's scant research showing that pre-assessment has any significant effect on teachers' instructional planning or student learning outcomes."

Despite our differences, we agreed that the likelihood of pre-assessment yielding positive results depends on how effectively it is applied. So we set out to clarify the foundation of effective pre-assessment for ourselves and for others.

What We Know

Pre-assessments are the instruments or methods teachers use to determine students' knowledge, skills, or dispositions before instruction. Theoretically, pre-assessments help teachers determine where to begin instruction and provide teachers with baseline data from which to plot students' learning progress.

Some pre-assessments are broad, addressing grade-level or course learning goals, and are administered at the beginning of an academic year or semester. Others are narrower in scope and are administered at the start of a specific unit, focusing on that unit's learning targets. Some advocates even recommend using pre-assessments at the beginning of every lesson.

Nearly every modern instructional planning model, differentiation approach, and personalized learning system incorporates some form of pre-assessment. The designers of these systems clearly believe that it's essential to tap students' prior knowledge, experience, skill levels, and potential misconceptions to target instruction to individual students' learning needs. In theory, pre-assessments also may spark students' interest and provide a metacognitive foundation for

self-monitoring and self-regulation by helping students connect new learning with already-acquired knowledge and understanding (Tomlinson & Moon, 2013).

Despite widespread advocacy, however, research evidence supporting the use of pre-assessments is hard to find (Cilliers, et al., 2012). The evidence that does exist comes mostly from college or university classrooms and focuses primarily on the use of pre-assessments as pre-tests from which improvements or gains in student learning can be calculated (Lazarowitz & Lieb, 2006; Wagner, Sasser, & DiBiase, 2002). We could find little research showing that successful teachers consistently use pre-assessment data in planning instruction or that the use of such data leads to improved student learning.

The Promises of Pre-Assessment

How, then, can teachers make sure that they're using pre-assessments in ways that make them worth the time they take? The answer: by keeping in mind the purposes and potential benefits that have been identified in the literature (Hockett & Doubet, 2014). Here are some of the most frequently mentioned potential benefits.

1. Determining Students' Prior Knowledge and Skills

Cognitive psychology underscores the importance of prior knowledge in learning. As Bransford, Brown, and Cocking (2001) state,

The contemporary view of learning is that people construct new knowledge and understandings based on what they already know and believe. ... A logical extension of the view that new knowledge must be constructed from existing knowledge is that teachers need to pay attention to the incomplete understandings, the false beliefs, and the naive renditions of concepts that learners bring with them to a given subject. (p. 10)

In other words, if new learning is built on a base of previous knowledge, it stands to reason that teachers should find out what students know, or think they know, about new topics or concepts. In this sense, pre-assessments are akin to the physical examination and diagnostic tests physicians use before prescribing an appropriate medical regimen.

Some pre-assessments measure prerequisite knowledge and skills; that is, what students *must* know and be able to do to succeed in mastering upcoming learning targets. On the unit level, a review of the required knowledge and skills (ideally focusing on specific gaps identified through pre-assessment) can be part of the unit introduction and typically requires only 15 or 20 minutes of class time. On the course level, an introductory unit might be planned to directly teach students these prerequisite skills. A classic study (Leyton, 1983) showed that high school teachers who began second-level mathematics and foreign language classes with a brief review of common learning difficulties and gaps in understanding identified on a course pre-assessment more than tripled the number of students who achieved mastery on course final examinations. This class review, coupled with individualized help for students who had specific difficulties, lasted just a week and a half but yielded impressive results.

2. Monitoring Student Progress

Assessing students' entry-level knowledge and skills at the start of a new unit or course also provides baseline data from which teachers can gauge improvements in learning. More formally, pre-assessment results may be used to calculate gain scores in value-added models of accountability or to monitor progress for instructional interventions (Jung, 2015). Teacher evaluation processes that include assessments of student learning objectives typically employ this type of pre- and post-test protocol. We should note, however, that this process can be corrupted, especially in high-stakes accountability contexts where gain scores are used for evaluation purposes. For example, teachers can achieve impressive gains simply by encouraging students to perform poorly on the pre-assessment.

3. Communicating Expectations

Pre-assessments may serve as signals to students of what they're about to learn. Carefully constructed pre-assessments also may be used as advance organizers (Ausubel, 1978) to activate prior knowledge, preview the content, and guide students' thinking about it. The technique of visualization in teaching specific behaviors or physical skills, for example, shows students models of excellent performance prior to instruction and then encourages students to mentally picture performing the skill with similar competence (Mahoney, Gabriel, & Perkins, 1987). Students can then self-assess their current skill and performance levels against models of excellence in order to set learning goals and monitor their progress along the way. Similarly, teachers sometimes provide students with examples of excellent writing and help students identify the elements that make the example so excellent before having students develop their own compositions. Often students set personal writing goals based on the models.

4. Focusing Students' Attention on Learning Targets

As they approach a new unit or course, students should focus on what they're going to learn rather than on the particular activities or assignments in which they will engage. In other words, we want students to think about how they will be different after doing this project, reading this book, or conducting this investigation.

A social studies teacher, for example, may ask students to respond to two essential questions at the start of a new unit on the Revolutionary War: (1) Why do people revolt? and (2) Is war ever justified? These questions prompt students' thinking and open the door to an exploration of the big ideas of the unit. At the end of the unit, students' response to these questions should demonstrate growth and deeper understanding.

5. Checking for Misconceptions

Misconceptions reflect preconceived notions or misunderstandings. Children construct mental models of the world on the basis of their experiences, and sometimes, especially in science, their conceptions are flawed (see Wandersee, Mintzes, & Novak, 1994). Teachers can identify these misconceptions with pre-assessments and then target them directly in their instruction.

The American Association for the Advancement of Science (AAAS) publishes a comprehensive database of commonly held misconceptions about topics in science, brief pre-assessments that

allow teachers to ferret out these misconceptions. Here's an example of a multiple-choice item designed to assess the common misconception that all cells have the same size and shape:

What is TRUE about the size and shape of cells?

1. All cells are the same size and shape.
2. All cells are the same size, but not all cells are the same shape.
3. All cells are the same shape, but not all cells are the same size.
4. Different cells can have both different sizes and different shapes.

The AAAS database reports that 41 percent of middle and high school students answered this item incorrectly. Such information can help a teacher confront this misconception during instruction.

6. Identifying Students' Interests, Talents, and Preferred Ways of Learning

At the beginning of the school year or a new course, a pre-assessment may help teachers find out about their students more personally. For example, teachers may have students write a brief letter describing themselves as learners, responding to such prompts as:

- What subjects or aspects of a particular subject do you enjoy most? Why?
- What subjects or aspects of a particular subject do you enjoy least or find most difficult? Why?
- What are your hobbies, interests, and talents?
- How do you learn best? What do you want your teachers to know that will help them help you learn best?

This kind of pre-assessment data can give teachers ideas about how to connect their students to the content. If the pre-assessment is in a written format, it can also provide information about students' writing skills. More important, a pre-assessment like this can communicate to students that their teacher cares about them and wants to get to know them.

Some Cautions

Despite their reasonableness, pre-assessments can have significant drawbacks that teachers need to consider. Here are some of the most frequently noted problems, along with suggestions for averting them.

1. Beginning on a Bad Note

Vernon Law, a famous baseball major league pitcher, once said, "Experience is the worst teacher; it gives you the test before presenting the lesson." The same can be said of pre-assessments. If pre-assessments simply demonstrate to students how little they know, this exercise may negatively affect their disposition toward the upcoming content.

To avoid this potential negative reaction, teachers should explain that the pre-assessment's purpose is to help the teacher optimize instruction, highlight learning targets, and help students

set learning goals. They also need to assure students that the results will not count against them. Rather than communicating to students, "Here is what you don't know and cannot do," the pre-assessment should emphasize "Here are the exciting things you're going to learn."

2. Wasting Instructional Time

Because pre-assessments typically address concepts and skills students haven't yet been taught, the results often don't surprise teachers. Especially when the curriculum is well organized and includes identified learning progressions, experienced teachers typically can accurately predict the results of pre-assessments. So if they provide no new information and only confirm what the teacher already knows, pre-assessments can steal valuable instructional time.

To avoid this potential drawback, teachers should employ pre-assessments only when the results cannot be predicted and when the exercise offers clear benefits to students. Further, pre-assessments should be brief and take as little time as possible. When suitable to the learning targets of the unit, true/false, multiple-choice, or short-answer items can efficiently reveal students' knowledge and skill gaps.

Experienced teachers who know their subject matter and their students well often design instructional materials that anticipate and address common student misunderstandings, thus making pre-assessments unnecessary. Therefore, we caution against requiring *all* teachers to use the same canned pre-assessments.

3. Creating Management Challenges for Teachers

The data from pre-assessments can present significant instructional challenges when the results reveal students at multiple knowledge and skill levels. A pre-assessment might show that (1) some students are well informed and can demonstrate their mastery of all the unit learning targets before instruction begins; (2) some are partially informed and have mastered some but not all of the learning targets; (3) some are uninformed and have no mastery of any of the learning targets; and (4) some are misinformed and have misconceptions regarding the learning targets. Preparing four different instructional plans to address the variation would not only challenge the most imaginative teachers, but also create significant classroom management problems.

The key to addressing this challenge rests in finding an efficient and effective compromise between completely individualized instruction and one-size-fits-all teaching. In planning lessons, teachers should include a variety of instructional strategies that tap the wide range of student interests and skill levels, and engage students in multiple types of learning activities. They might consider giving the class an assignment while offering a mini-lesson for a small group; having two or more teachers work with small groups to address specific needs; or enlisting the assistance of an instructional aide or resource teacher. With guidance, students may even be able to self-select the activities that help them learn best. Another option might be to begin with a really engaging instructional activity that involves all students, move quickly through a learning experience focused on an essential understanding, administer an authentic formative assessment, and then differentiate additional instruction on the basis of the results.

4. Taking Too Much Time to Analyze

To make pre-assessment data useful for instructional purposes, teachers must gather and analyze the pre-assessment data quickly—before the introduction of the new unit. So teachers must use assessment formats that allow for rapid scoring and tallying of results, especially at the secondary level, where teachers typically see a large number of students daily.

One strategy for gathering these data and activating background knowledge before instruction is to have students develop a KWL chart (Ogle, 1986). The chart consists of three columns: *K* for what students already know about the topic or can already do, *W* for what they want to learn or be able to do, and *L* for what they learned from the unit. These charts can be used in any subject area to gather information from students quickly and efficiently.

Another efficient technique is to use white boards or pupil-response systems with which students respond to prompts, typically in true/false or multiple-choice formats, to provide the teacher with a quick check of their prior knowledge.

Proceed with Caution

Our exploration of pre-assessments justifies both prudent skepticism and cautious optimism. We caution educators not to simply embrace a practice that seems to "make sense" without critically examining its purported benefits and possible drawbacks. The usefulness of pre-assessments depends on their purpose, form, and utility. They can guide teachers to more effective instruction, but they also can be a waste of valuable instructional time. Successful implementation requires teachers to take advantage of the potential benefits while avoiding the potential drawbacks, keeping in mind the central purpose of helping all students learn well.

Guidelines for Effective Pre-Assessment

The following recommendations can help ensure that pre-assessments remain practical, provide useful data, and enhance student learning.

1. Clarify the purpose(s) for pre-assessment.

Carefully consider why you are pre-assessing, what information you are intending to uncover, and what methods you will use to gather that information.

Always explain the purpose of the pre-assessment to students. Emphasize that the information from the pre-assessment is intended to help you better understand how to address students' needs, connect to their interests, and excite them about the forthcoming topics. Assure students that the results of these assessments will not be used for grading purposes.

2. Determine how you will use the information.

Pre-assessment without associated action is like eating without digestion. Use the results of pre-assessments to adapt your teaching to enhance student learning. Your possible adaptations include reviewing essential knowledge and skills students may be lacking, addressing misconceptions students may harbor, providing specifically targeted instruction to the class, linking the content to students' interests if appropriate, and differentiating instruction for individuals or groups when needed.

3. Use pre-assessments judiciously and efficiently.

Pre-assessments are not necessary for every new instructional unit. Use them only when they provide information you don't already have or cannot anticipate and when they prompt student interest or thinking about the topic to be learned. When you do employ pre-assessments, use easy-to-give and easy-to-check formats (for example, true/false, multiple-choice, KWL) that yield quick, useful information to guide instruction. We generally do not recommend the use of pre-assessments in advance of individual lessons.

This article is part of a Special Section on Examining Current Assessment Practices in the April 2016 issue of *Educational Leadership*.

- **Pre-Assessment: Promises and Cautions**, by Thomas R. Guskey and Jay McTighe
- **Standardized Tests: Purpose Is the Point**, by W. James Popham
- **Grading: Why You Should Trust Your Judgment**, by Thomas R. Guskey and Lee Ann Jung

References

- Ausubel, D. (1978). In defense of advance organizers: A reply to the critics. *Review of Educational Research*, 48, 251–257.
- Bransford, J., Brown, A., & Cocking, R. (Eds.). (2001). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Research Council.
- Cilliers, F. J., Schuwirth, L. W. T., Herman, N., Adendorff, H. J., & van der Vleuten, C. P. M. (2012). A model of the pre-assessment learning effects on summative assessment in medical education. *Advances in Health Sciences Education*, 17(1), 39–53.
- Hockett, J. A., & Doubet, K. J. (2014). Turning on the lights: What pre-assessments can do. *Educational Leadership*, 71(4), 50–54.
- Jung, L. A. (2015). *A practical guide to planning interventions and monitoring progress*. Bloomington, IN: Solution Tree.

Lazarowitz, R. & Lieb, C. (2006). Formative assessment pre-test to identify college students' prior knowledge, misconceptions and learning difficulties in biology. *International Journal of Science and Mathematics Education*, 4(4), 741–762.

Leyton, F. S. (1983). *The extent to which group instruction supplemented by mastery of initial cognitive prerequisites approximates the learning effectiveness of one-to-one tutorial methods*. Doctoral dissertation, University of Chicago, Chicago, IL.

Mahoney, M., Gabriel, T., & Perkins, A. (1987). Psychological skills and exceptional athletic performance. *The Sport Psychologist*, 1, 181–199.

Ogle, D. M. (1986). K-W-L: A teaching model that develops active reading of expository text. *Reading Teacher*, 39, 564–570.

Tomlinson, C. A., & Moon, T. R. (2013). *Assessment and student success in a differentiated classroom*. Alexandria, VA: ASCD.

Wagner, E. P., Sasser, H., & DiBiase, W. J. (2002). Predicting students at risk in general chemistry using pre-semester assessments and demographic information. *Journal of Chemical Education*, 79(6), 749–755.

Wandersee, J. H., Mintzes, J. J., & Novak, J. D. (1994). Research on alternative conceptions in science. In D. Gabel (Ed.), *Handbook of research in science teaching and learning* (pp. 177–210). New York: Macmillan.

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