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We must discover where our learners are in their learning relative to where we aim for them to be at the end of a particular learning experience.

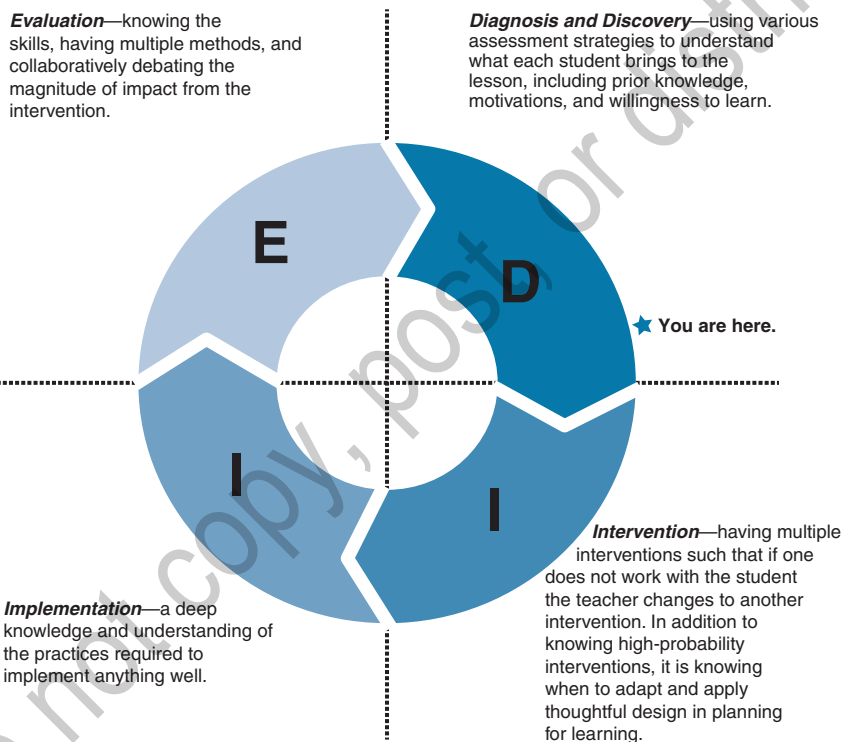
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CHAPTER 2

DIAGNOSIS AND DISCOVERY

Figure 2.1 The DIIE model



Knowing what intervention or approach will most likely ensure learning requires that teachers have a robust understanding of where each of their learners is in their learning journey. Furthermore, knowing what alterations to make to an intervention or approach requires an understanding of the local context, including the dispositions, unique characteristics, and learning experiences learners bring to the learning environment. This necessitates a diagnosis. The main idea for this chapter, then, is that success in moving from intention to implementation, and subsequently having an impact on our students' learning, requires that teachers know their learners and where they are in the learning journey.

As we eavesdrop on Diane Henry's mathematics block, we get a glimpse of this component of the DIIE model in action. "Before I begin a new topic or unit in mathematics, I give my second graders a problem related to the new learning. Today, two-digit subtraction, with re-grouping." The buzz in the room is noticeable. Ms. Henry's second graders are busy working through a scenario that pre-assesses their background or prior knowledge in both regrouping and subtraction. As her learners engage in the scenario, she observes their dialogue, behaviors, and their interactions with their peers.

"I am not just observing their understanding of place-value and subtraction, although that is very important. I am listening to their use of mathematics language, their choice of problem-solving methods and manipulatives, and, then, also, how they engage in a challenging task with their peers. Are they motivated to engage in tough problems? Can they work cooperatively in these tough situations?" Ms. Henry is not only considering her students' content knowledge. She is also examining their current dispositions, unique characteristics, and learning experiences in behavioral and social-emotional areas.

When selecting the best interventions for the current content or skills, we do not start with the just the *what* (i.e., place-value, two-digit subtraction, regrouping, etc.). We also need to know the *who* (i.e., dispositions, unique characteristics, and learning opportunities).

When selecting the best interventions for the current content or skills, we do not start with the just the *what* (i.e., place-value, two-digit subtraction, regrouping, etc.). We also need to know the *who* (i.e., dispositions, unique characteristics, and learning opportunities). This requires that we take an in-depth look at what is meant by *diagnose* in the DIIE model, which we are just about ready to do. However, before that, we want to provide some clarification on the terminology.

Many of us recoil a bit at the use of the word *diagnose*. In our initial exploration of this model, we did the same thing. The word *diagnose* has negative connotations of disease and ailments based on symptoms of some underlying pathology. This is unfortunate. When we consider the origin and meaning of the word *diagnose*, we find a much more robust meaning that makes the term *diagnose* exactly the right term for the message we need to guide our decision making in the learning environment. Several of us (the authors) enjoy studying word origins and, in this case, looking into the origins of this word provides a better context for our discussion.

The origin of the word *diagnose* can be traced back to the combination of the Greek stem, *dia*, with *gignoskein*. *Dia* is a stem that means "between" and *gignoskein* means "to learn" or "come to know." When we put these two parts together, we arrive at the Greek word *diagignoskein*, and from there, the word, *diagnosis*. When we focus on the root meaning of the word *diagnosis*, this brings us to a

more robust definition of, a discerning, distinguishing, or to come to know thoroughly or apart (Beekes, 2010). This is exactly what we mean when we use the word *diagnose* in the DIIE model. There is nothing pathological or related to the identification of a disease or ailment in our learners. Instead, the first component in the DIIE model requires that we thoroughly know our learners and seek to discern where they are in their learning—academic, behavioral, and social-emotional. As shown in Figure 2.2, we must discover where they are in their learning relative to where we aim for them to be at

We must discover where our learners are in their learning relative to where we aim for them to be at the end of a particular learning experience.

Figure 2.2 Diagnosing and discovering the gap

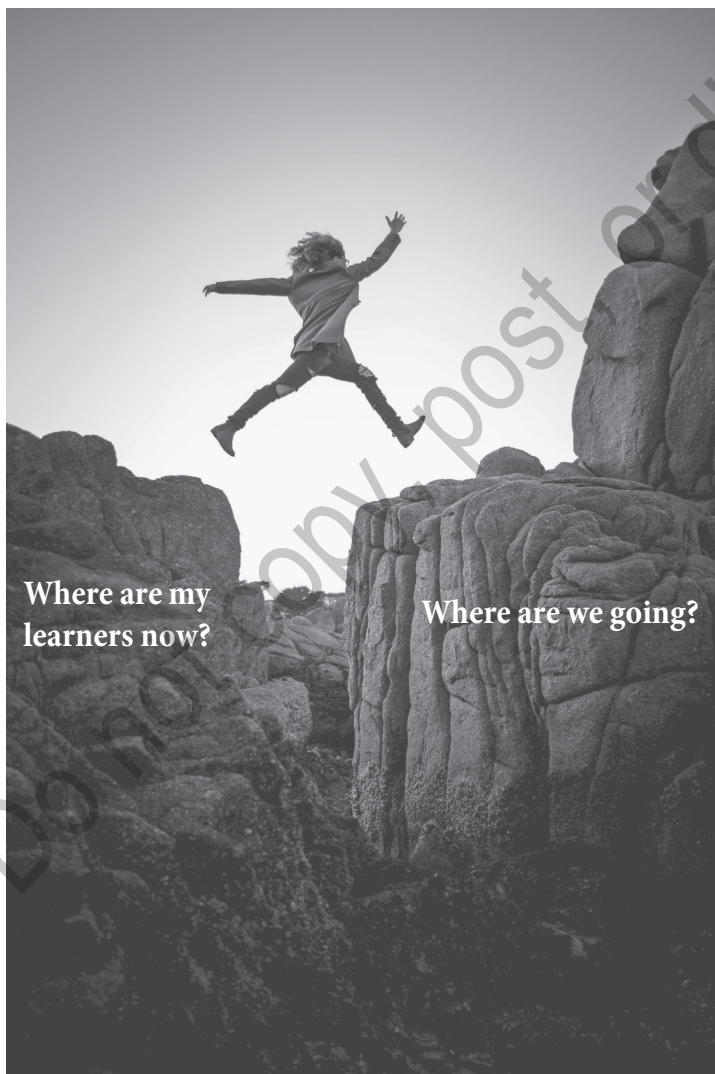


Photo by Sammie Vasquez on Unsplash

the end of a particular learning experience. Closing this gap is our primary objective as teachers.

The Who Behind the Learning

A key element of discerning where our learners are, is to also determine the context in which our students are learning. To determine context, teachers should also be asking, *who is learning with me?* (Bustamante & Almarode, 2020). Through this question, we should devote time to thinking about the environment in which students are conducting learning both at school and at home. This includes the physical, social, and emotional environment. Will they have a place to focus on their learning? Who else is in their environment with them? Are they, themselves anxious, uncertain, or ill? The answers to each of these questions introduce additional variables into the learning equation—variables that absolutely cannot be ignored for the sake of multiplying fractions, learning about cellular reproduction, understanding the author’s purpose, and analyzing historical documents. The *who* behind the *do* is immeasurably important. Ensuring that we have clarity about *who* is learning will ultimately determine the impact we will be able to *do* with and for our learners.

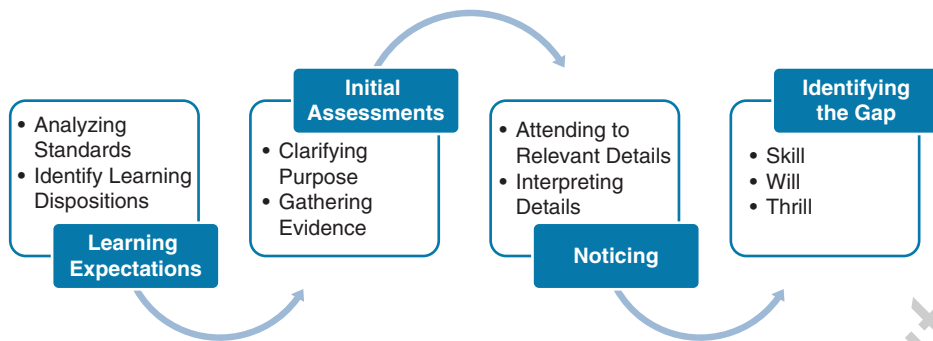
Using various assessment strategies to understand what each student brings to the lesson—including their prior knowledge, motivations, and willingness to learn—allows teachers to make effective and efficient decisions about where to go next in the learning.

In other words, how far apart are the learning expectations from the current dispositions, unique characteristics, and learning opportunities of our learners? The intervention and implementation must close this gap between what students know and can do, and what they need to know and be able to do. Using various assessment strategies to understand what each student brings to the lesson—including their prior knowledge, motivations, and willingness to learn—allows teachers to make effective and efficient decisions about where to go next in the learning.

Here is our path forward through this component of the model. To diagnose and discover the current dispositions, unique characteristics, and learning opportunities of our learners, we must:

1. Analyze the learning expectations (e.g., national or local standards) to understand what learners must know, understand, and be able to do in a given grade or content area.
2. Design and implement initial assessments that diagnose and discover gaps in student knowledge, skills, and understandings.
3. Use expert teacher-noticing to attend to student responses surrounding those initial assessments and make sense of that information (see Figure 2.3).

Figure 2.3 The essential parts of diagnosing or discovering



Standards of and for Learning as the Starting Point

For most of us, where we are going in our teaching and learning is driven by standards of learning. Whether your standards are national expectations or specific to a state or province, these official documents set the expectations for learners in that particular year of schooling. For example, in the United States, states adopt standards for each subject area. In Canada, the standards are unique to each province while Australia and New Zealand have national standards. Although standards vary depending on where we teach, all of us must start with analyzing the standards to identify the concepts and skills within each one. Let's return to Ms. Henry's classroom and understand the process she engaged in to develop a clear picture of where her learners were going.

In Grade 2 mathematics, Ms. Henry engages in the DIIE model by first looking at the mathematics standards for this unit on sums and differences.

The student will

- estimate sums and differences;
- determine sums and differences, using various methods; and
- create and solve single-step and two-step practical problems involving addition and subtraction.

Source: Virginia Department of Education. (2016). *Mathematics standards of learning*. Virginia Department of Education: Richmond, VA.

In addition to the core standard for this unit, Ms. Henry must spend time analyzing the curriculum framework and other supporting documents that accompany the core standard. For

this specific standard, there are essential skills and knowledge articulated by the state's Department of Education.

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to

- Estimate the sum of two whole numbers whose sum is 99 or less and recognize whether the estimation is reasonable (e.g., $27 + 41$ is about 70, because 27 is about 30 and 41 is about 40, and $30 + 40$ is 70). Refers to (a) in the standard.
- Estimate the difference between two whole numbers each 99 or less and recognize whether the estimate is reasonable. Refers to (a) in the standard.
- Determine the sum of two whole numbers whose sum is 99 or less, using various methods. Refers to (b) in the standard.
- Determine the difference of two whole numbers each 99 or less, using various methods. Refers to (b) in the standard.
- Create and solve single-step practical problems involving addition or subtraction. Refers to (c) in the standard.
- Create and solve two-step practical problems involving addition, subtraction, or both addition and subtraction. Refers to (c) in the standard.

Source: Virginia Department of Education. (2016). *Mathematics standards of learning*. Virginia Department of Education: Richmond, VA.

Ms. Henry's grade-level team starts by identifying the concepts contained within this standard and supporting documents. These concepts, often identified as the nouns or noun phrases, provide a picture of what knowledge, ideas, and terms learners will be expected to master (see Tables 2.1, 2.2, and 2.3 for examples). In addition, they must determine what skills are expected in this learning by identifying the verbs or verb phrases within the standard. What will their learners be expected to do as a result of their learning? This should include processes or practices associated with a particular discipline (e.g., science and engineering practices, social studies and literacy skills, and college/career readiness skills).

At the end of this analysis, Ms. Henry and her colleagues have a clear picture of the expectations for their learners. They have an understanding of what learners are expected to know, understand, and be able to do within the context of sums and differences. But there is one final aspect of this process that takes into account the dispositions of learners.

Table 2.1 Analyzing the standard for concepts and skills

Concepts (Nouns)	Skills (Verbs)	Mathematical Practices
sums	estimate	problem solving
differences	determine	reasoning
methods (approaches)	create	communicating
whole numbers	solve	connecting
estimation (reasonable)		representing (modeling)
addition		
subtraction		
practical		

At William Perry Primary School, the faculty spent time over the past summer to develop dispositional expectations of a learner. In other words, the entire school has embraced a common definition of what it means to be a “good learner” at William Perry. These dispositional traits include cooperation, perseverance, and respect. Therefore, Ms. Henry and her colleagues must analyze where these fit into this unit and where they expect their second graders to be in each of these areas. Furthermore, these dispositional traits transcend the physical learning environment. They can and should be a part of a remote learning environment as well. What are the expectations for collaborative learning with peers, strategies for persevering, and demonstrating respect for all members of the school and learning community?

Before moving on, let’s look briefly at two other examples from Canada and England.

General Outcome

Students will explore the impacts of globalization on their lives.

Specific Outcomes

Values and Attitudes

Students will:

- 1.1 acknowledge and appreciate the existence of multiple perspectives in a globalizing world.
- 1.2 appreciate why peoples in Canada and other locations strive to promote their cultures, languages, and identities in a globalizing world.

(Continued)

(Continued)

- 1.3 appreciate how identities and cultures shape, and are shaped by, globalization.

Knowledge and Understanding

Students will:

- 1.4 explore ways in which individuals and collectives express identities (traditions, language, religion, spirituality, the arts, attire, relationship to land, ideological beliefs, role modeling).

Source: Alberta Learning. (2007). *Social Studies 10-1* [Program of Studies]. Edmonton, Canada: Alberta Learning.

Table 2.2 Analyzing the standard for concepts and skills

Concepts (Nouns)	Skills (Verbs)	Dimensions of Thinking
globalization	explore	critical thinking
culture	acknowledge	creative thinking
language	appreciate	historical thinking
identities		geographic thinking
traditions		
religion		
spirituality		
arts		
attire		
relationship to land		
ideological beliefs		
role modeling		

Stage 4 Reading

Pupils should be taught to

- read and appreciate the depth and power of the English literary heritage through
 - reading a wide range of high-quality, challenging, classic literature and extended literary nonfiction, such as essays, reviews, and journalism. This writing should include whole texts. The range will include:
 - at least one play by Shakespeare
 - works from the 19th, 20th, and 21st centuries
 - poetry since 1789, including representative Romantic poetry

- re-reading literature and other writing as a basis for making comparisons
- choosing and reading books independently for challenge, interest, and enjoyment
- understand and critically evaluate texts through
 - reading in different ways for different purposes, summarising and synthesising ideas and information, and evaluating their usefulness for particular purposes
 - drawing on knowledge of the purpose, audience for, and context of the writing, including its social, historical, and cultural context and the literary tradition to which it belongs, to inform evaluation
 - identifying and interpreting themes, ideas, and information
 - exploring aspects of plot, characterisation, events, and settings, the relationships between them and their effects
 - seeking evidence in the text to support a point of view, including justifying inferences with evidence
 - distinguishing between statements that are supported by evidence and those that are not, and identifying bias and misuse of evidence
 - analysing a writer's choice of vocabulary, form, grammatical and structural features, and evaluating their effectiveness and impact
 - making critical comparisons, referring to the contexts, themes, characterisation, style, and literary quality of texts, and drawing on knowledge and skills from wider reading
- make an informed personal response, recognizing that other responses to a text are possible and evaluating these.

Source: Department for Education. (2014) The national curriculum in England: Complete framework for key stages 1 to 4. Available at: <https://www.gov.uk/government/publications/national-curriculum-in-england-framework-for-key-stages-1-to-4> (Accessed July, 21, 2020).

Table 2.3 Analyzing the standard for concepts and skills

Concepts (Nouns)	Skills (Verbs)	Literacy Skills
literary heritage	summarising	inferring
context (social, historical, cultural)	synthesising	referring to evidence in text

(Continued)

Table 2.3 (Continued)

Concepts (Nouns)	Skills (Verbs)	Literacy Skills
literary tradition	identifying	knowing purpose
themes	interpreting	comprehension
plots	exploring	reading critically
characterisation	seeking (evidence)	vocabulary building
features (grammatical and structural)	distinguishing	
literary quality	analysing	
Shakespeare	making comparisons	
literary time periods		

Note: British spellings are used in Table 2.3, reflecting the standard from the national curriculum in England.

In the end, these teachers have defined the right side of the cliff in Figure 2.2. They now know where their learners are going. But, the whole idea behind diagnosis or discovery is to discern where students are in their learning relative to where we aim for them to be at the end of a particular learning experience. To do this, we must analyze standards and design initial assessments that accomplish two goals:

1. What do the learners already know, understand, and are able to do related to the specific concepts, skills, practices, and dispositions in this standard?
2. What relevant prior learning have the learners retained and are able to retrieve (e.g., whole numbers, estimation, and communication)?

The analysis of standards and knowing where we are going sets the stage for us to look backwards and forward in diagnosing where students are in their learning.

Initial Assessments

When we engage in discovering what our students bring to the learning environment and each individual learning experience or engaging task, we must take into account students' background knowledge, prior knowledge, skills, and understandings. Ms. Clouse, an English teacher in the Midwest, shares that, "I cannot move forward with any learning until I have a clear picture of where

my learners are in their own learning. For English 10, I need to not only have a grasp of what they know about the content, but I need to make sure I know their skill level in reading and writing as well. They can talk to me all day about the definitions, but if there is a gap with their reading comprehension skills and writing skills, that may stop us from actualizing their potential. I am always afraid that I will miss a learning opportunity that will hinder later progress.” What Ms. Clouse is talking about is the evidence provided by incorporating pre- or initial assessments into our diagnosis and discovery of our learners. Some estimates are that learners already know about 60 percent of what we expect them to learn (Nuthall, 2007). The initial assessment can be of great value to teachers, in both time and understanding of students’ knowledge.

The purpose of the initial assessment is for us to gather evidence about students and their background knowledge and prior knowledge. Hockett and Doubet (2014) explain the initial assessment as “a way to gather evidence of students’ readiness, interests, or learning profiles before beginning a lesson or unit and then using that evidence to plan instruction that will meet learners’ needs” (p. 50). This strategy essentially serves to inform us about “where the student is” in their journey, and this information can inform next steps for learning. This evidence also serves as a reminder of what we may not have to explicitly teach simply because our learners are already proficient in the content or skills. To be clear, this does not mean that we do not have to use checks for understanding and progress monitoring to ensure retention. Ms. Clouse recalls a situation where she felt like valuable instructional time was wasted because she did not initially assess her learners. “Imagine coming into a unit on figurative language, devoting an entire week to the different types of figurative language only to find out that their success in this particular content and its application comes from the fact that they already knew about similes, metaphors, hyperbole, personifications, etc. . . . To add to this, because I did not initially assess my learners about symbolic representation, our literary analysis of *Lord of the Flies* by William Golding proved to be difficult and challenging for reasons above and beyond the learning intentions and success criteria. I had no idea what tripped them up because I did not ask.”

Initial assessments prior to teaching new content or skills help us diagnose and discover what learners already know and can do. This allows us to make better decisions about where to go next in the learning journey. Guskey and McTighe (2016) discuss the importance of taking into account the prior knowledge students bring to any learning situation, as paramount to the learning of new information. They note that “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” (p. 39).

The purpose of the initial assessment is for us to gather evidence about students and their background knowledge and prior knowledge.

Table 2.4 Examples of different ways to determine what students know and don't know yet

entrance tickets
think-pair-shares
writing prompts
anchor problems
reading responses
mini-laboratory
open-ended questions
class discussion
student-generated questions
concept or thinking map

An initial assessment should not be considered a “pre-test.” This is often an error in understanding that leads to a misuse of the initial assessment as a high-influence strategy and limits the value of the evidence generated by the assessment. A main reason to differentiate between an initial assessment and a pre-test has to do with the purpose of the assessment. An initial assessment is used to determine what our students know and do not know, yet, also necessary for us to make decisions about the implementation of specific interventions that will move students closer to where we are going in the learning. Table 2.4 illustrates some different types of initial assessments.

While a pre-test is often followed up with a post-test at the end of the unit and provides us data for calculating growth, this testing scenario can cause some complications for the discovery process, especially when these evaluations are linked to grades. One fast and furious way to disrupt an environment that encourages mistakes and errors, put a grade on it. Guskey (2018) highlighted the potential complications of pre- and post-testing as follows, “When teachers base students’ grades on progress from pre-test to post-test, students recognize that doing poorly on the pre-test enhances their chances to show improvement and earn higher grades on the post-test” (p. 3). So, if the intention of the initial assessment is to determine what students are bringing to class in terms of dispositions, unique characteristics, and learning opportunities, then the initial assessment must not be a test.

Development of Initial Assessments

There are guidelines to consider in developing initial assessments that help educators diagnose and discover. Following these

guidelines ensures that learners are not discouraged and deceived. Guskey and McTighe's work (2016) provides us with guidelines for the development of initial assessments. They are:

1. Clarify the purpose(s) for the initial assessment. This purpose should come directly from the learning intentions and success criteria. The learning intentions and success criteria should lead directly to the initial assessments. What do learners already know, understand, and what are they able to do prior to the lessons?
2. Determine how you will use the information. When learners engage in an initial assessment, what will the information be used for? What role will this evidence play in the next decision about teaching and learning? If we plan on going about business as usual (e.g., per the pacing guide), then the initial assessment is a waste of time.
3. Use initial assessments judiciously and efficiently. Design initial assessments so that they provide quick and readily accessible evidence to both teachers and students. If the initial assessment cannot inform the immediate next steps, we should reconsider the initial assessment.

Clarifying the purposes of initial assessments serves to keep learners informed as to the reasoning or “why” behind our assessment. Mr. Lee is a high school social studies teacher who has devoted a lot of energy to making sure his learners understand the “why” behind initial assessments. “Once my learners participate in a task, say, responding to a particular Supreme Court decision, we debrief the task by developing a list of ‘Things I Need to Know’ that would have helped me better respond to the Court’s decision.” Mr. Lee, by modeling evaluative thinking, has emphasized the purpose of the initial assessment and then used the evidence to collaboratively develop guiding or driving questions for the next steps in his students’ learning about judicial review. As we consider the reasoning behind the initial assessments, collaborating with our learners models the value of not knowing, yet. Mr. Lee is highlighting the importance of mistakes and helping his learners recognize where they are going next in their learning as well as providing them ways to monitor progress. Mr. Lee often thanks them by “letting them know that this assessment helps me better understand their thinking and promising to change our plans for moving forward based on where I can be of most help as their teacher.” Mr. Lee knows how he is going to use the information gathered from the initial assessment before he ever engages learners in the task.

Our initial assessments should be used judiciously and efficiently. Initial assessments need to be used when “results cannot be predicted

and when the exercise provides clear benefits to students” (Guskey & McTighe, 2016, p. 42). If initial assessments are created with the learning intentions and success criteria in mind, that is truly when we can employ initial assessments with impact. The information they provide helps us capture the skill, will, and thrill of our learners.

Teacher Noticing

Mr. Kim has provided his learners with several different weighted marbles, plastic malleable track, and other supplies (e.g., protractor, rule, calculator, and graphing paper) at their laboratory stations. He introduces the task at hand by getting their attention and sharing the following prompt: “Over the next several days we are learning about the relationships between different variables in projectile motion. Your task is to use as little or as many of the available supplies at your laboratory benches.” Mr. Kim has designed and implemented this mini-laboratory as an initial assessment on two-dimensional or projectile motion. However, the rationale for using this task as an initial assessment may be difficult for some of us to see. We may look at this and, when weighing this decision against a more traditional paper-pencil initial assessment, ask how this is going to tell Mr. Kim what his learners know and do not know. An entrance ticket, set of multiple-choice questions, or a paper-pencil problem set would work better in this situation, right? The answer to this question has to do with what Mr. Kim notices during this task.

Teacher noticing is the active process of attending to what is happening in a particular learning task or activity and then interpreting what we see. For Mr. Kim, his noticing requires that he notice what learners are doing during the mini-laboratory and then he must interpret those actions through the lens of where his learners are going. From the perspective of teacher noticing, the question of how is this mini-laboratory going to provide the information Mr. Kim needs is actually the wrong question to ask. Instead, we should be asking the following questions of Mr. Kim and ourselves (adapted from Sherin, Jacobs, & Philipp, 2011):

- What are we noticing about students as they engage in learning tasks?
- What does this tell me about their current dispositions, unique characteristics, and learning opportunities?

From Ms. Henry to Mr. Kim, analyzing standards, designing and implementing initial assessments, and then having your learners take part in those assessments is not a stopping point. An initial assessment is only as good as the evidence it gathers about students’ prior knowledge, motivations, and willingness to

learn. Furthermore, that evidence is only worthwhile if we notice what is needed to move learning forward. Those that are better at teacher noticing, often referred to as *expert noticing*, are quicker at identify situations that need an intervention, recognize when a new approach to teaching is needed, better incorporate student interests and motivations into teaching, chunk and pace the learning through the learning progression, and recognize when learners have truly got it (Schoenfeld, 2011). In fact, Schoenfeld (2011) suggested that expert noticers devote more of their time to what he calls “diagnostic teaching” rather than behavior management. So, what goes into Ms. Henry’s and Mr. Kim’s noticing so that what they notice truly informs their sense-making about student prior knowledge, motivations, and willingness to learn? What allows them to engage in diagnostic teaching?

First, to engage in diagnostic teaching, we must have strong knowledge of the content and skills students are expected to learn. Beyond analyzing the standard, we must have the necessary content knowledge to understand what proficiency and mastery look like in sums and differences, two-dimensional motion, and globalization, for example. This requires us to draw on our own content knowledge as teachers within the particular domain associated with the new learning. With regard to new learning, we also have to see learning from the learners’ perspective and recognize how they are most likely to approach the content (Ball & Bass, 2009). Figure 2.4 helps show this relationship.

For Ms. Henry, this means she needs to not only anticipate, but recognize when a learner simply rearranges the numbers instead of regrouping. If a learner says that $43 - 27 = 24$, he or she simply flipped 3 and 7 to make sure the smaller number was subtracted from the larger number. Mr. Kim has to recognize that learners may not see the relationship between dropping the steel marble and using the plastic ramp as both being projectile motion. Teacher noticing, and thus diagnostic teaching, requires educators to blend their content knowledge with learners’ novice approaches to content so that teachers can spot students’ current level of understanding.

To get the most from our standards and initial assessments, we have to engage in teacher noticing through evaluative thinking

Figure 2.4 Two components of teacher noticing



and reflecting on our teaching. Teacher noticing requires that we are selective about what we notice and purposefully overlook. This means we have to approach any learning experience, face-to-face or remote, aware of what we are looking for from our learners so that we are not distracted by those things that are not directly related to assessing what learners know, understand, and are able to do. For example, if learners cooperatively work to identify character traits from a text and then support their thinking with evidence from the text, focusing on whether learners are seated at their desks versus standing will inhibit our ability to engage in diagnostic teaching about their understanding of character traits and the skill of using evidence from text. Along those same lines, we cannot possibly process everything that is going on in a single learning task or activity with every learner. For a class of 30 students, we must engage in quick scans that intentionally seek the essential knowledge, skills, and understandings extracted from the standard. These quick scans should also seek to recognize when learners are demonstrating a solid understanding of a concept. Catching students being successful is just as important as identifying gaps in knowing where they are in their learning.

What both Ms. Henry and Mr. Kim demonstrate is that they have:

1. Thought carefully about the expectations for their learners and the specific content they are expected to know, understand, and be able to do.
2. Developed an initial assessment that would generate multiple sources of evidence around this content.
3. Capitalized on their own content knowledge in these areas to carefully notice their students' thinking.
4. Established a continuous sense of this demonstrated thinking to better understand where their students are in their learning.

By selecting the specific initial assessment to gather this evidence, Ms. Henry and Mr. Kim provide multiple opportunities for their learners to show not only their content knowledge, but their dispositions about the learning. In general, this allows us to pull together all of this evidence, incorporating behavioral and social-emotional factors, to diagnose and discover the presence of a gap and the nature of that gap. If we notice specific aspects of their dispositions, the gap may not be related to knowledge or skill, but motivation. If we notice aspects of our learners' skill sets, the gap may not be related to motivation or knowledge, but require the deliberate practice of a specific skill. Lastly, if we notice aspects of our learners' knowledge base, the gap may not be related to skills or motivation.

This gap, then, represents the skill, will, and thrill of our learners. As Hattie and Donoghue (2016) point out,

The skill, will and thrill can intertwine during learning and that these three inputs are also important outcomes of learning—the aim is to enhance the will (e.g., the willingness to reinvest in more and deeper learning), the thrill (e.g., the emotions associated with successful learning, the curiosity and the willingness to explore what one does not know) and the skills (e.g., the content and the deeper understanding).
(p. 9)

Diagnosing and discovering who is in our schools and learning environments represents the first part of closing the gap between design and execution, intention and potential to implementation. At the onset of this component, this may appear to be a very daunting task. But what we hope we have done in this chapter is break down diagnosing and discovering into its essential elements:

1. Analyze the national and local standards to understand the expectations around what learners must know, understand, and be able to do within that framework.
2. Design and implement initial assessments that diagnose and discover gaps in student knowledge, skills, and understandings.
3. Use expert teacher noticing to attend to student responses surrounding those initial assessments and make sense of that information.

Once we have evidence about where learners are now, our purpose—our goal, our own skill, will, and thrill—is to make decisions about what intervention will “enhance the will, the thrill, and skills” of our learners.