

Assessment Literacy for Teacher Candidates: A Focused Approach

Christopher R. Gareis
The College of William and Mary

Leslie W. Grant
The College of William and Mary

Abstract

The assessment of student learning has always been an integral element of the craft of teaching; however, contemporary demands for demonstrable student growth and teacher accountability have heightened the importance of this domain of professional responsibility. Additionally, there is evidence that many novice and experienced teachers tend to be relatively weaker in this domain as compared to other areas of professional practice, such as instructional planning, instructional delivery, and classroom management. This article describes an approach to developing the assessment literacy of teacher candidates in a nationally accredited, public university. A definition of assessment literacy and a conceptual framework for the foundational knowledge and skills of assessment literacy are presented and explained within the context of a focused, one-credit course for pre-service general education teachers. Evidence of impact is provided, as are limitations and cautions. The article concludes with grounded insights into the need to develop the assessment literacy of teacher candidates.

Keywords: assessment literacy, teacher candidates, teacher preparation

Assessment Literacy for Teacher Candidates: A Focused Approach

The assessment of student learning has always been part of the craft of teaching. Consider, for example, the Socratic method: It is one of our oldest instructional models, and it can be characterized simply as teaching through questioning. In modern parlance, the Socratic method is the use of assessment *for* learning. The teacher poses a question to determine the present understanding of her student, and then engages the student in a series of questions and answers with the intent of leading the student to a new understanding of the topic at hand.

In the contemporary education context, assessment has taken on new roles beyond progressing student learning. The passage of *No Child Left Behind* in 2001 established federal expectations for the assessment of student learning by each of the states as an accountability measure. More recently, states such as Virginia have enacted standards that require the demonstration of student progress as a significant component of teachers' evaluations (Virginia Board of Education, 2011). These movements have placed increasing importance on the role of assessment for purposes of evaluation—that is, the measuring of student learning in order to render judgments of the effectiveness or value of instructional efforts.

The Socratic method and current teacher evaluation standards represent two ends of what we might consider the spectrum of assessment. At one end is the use of assessment as an instructional strategy, and at the other end is the use of assessment as a means for holding educators accountable. In between these sits a more classic view of assessment, which has been defined as the creation and use of a technique or instrument to gather relevant and dependable information about the nature and degree of a student's acquisition of intended knowledge and skills (Gareis & Grant, 2008). Conventionally, such assessment practices in the classroom might take the form of quizzes, unit tests, and formal assignments. They might also take the form of standardized diagnostic assessments such as Phenomenological Awareness Literacy Screening (PALS) or teacher-made pre-assessments. Teacher-directed assessment practices also include the use of techniques such as personal whiteboards, exit cards, thumbs-up/thumbs-

down, student conferences, and even watching facial expressions. This spectrum of classroom-based, teacher-directed assessment practices represents the means by which a teacher gathers relevant and dependable information about the nature and degree of student learning so that she can then draw inferences, make decisions, communicate with others, and take instructional actions.

Taken together, the use of assessment *for* learning (e.g., the Socratic method), the use of external standardized assessments (e.g., state assessments), and the use of a variety of assessments in the classroom by teachers (e.g., thumb-up/thumbs down and unit tests) represent the domain of assessment as a set of professional competencies. The assessment domain has been conceptualized by government bodies and professional associations, and there is broad consensus on the competencies that constitute the domain. A sample comparison is presented in Table 1, and it includes the Commonwealth of Virginia’s Uniform Performance Standards, the Council of Chief State Schools Officers’ Interstate New Teacher Support and Assessment Consortium (InTASC) standards, and the National Board for Professional Teaching Standards (NBPTS).

Table 1

Sample Standards for the Domain of Assessment as Articulated at the State and National Levels

Virginia Uniform Performance Standards (Virginia Board of Education, 2011, p. 7)	Interstate New Teacher Support and Assessment Consortium (2011, p. 9)	National Board for Professional Teaching Standards (1989)
“The teacher systematically gathers, analyzes, and uses all relevant data to measure student academic progress, guide instructional content and delivery methods, and provide timely feedback to both students and parents throughout the school year.”	“The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher’s and learner’s decision making.”	“NBCTs know how to assess the progress of individual students as well as the class as a whole.” “They use multiple methods for measuring student growth and understanding, and they can clearly explain student performance to parents.”

Although Table 1 presents a limited sample, it is evident that there is common agreement about what constitutes the domain of assessment for classroom teachers.

The Importance of Assessment in Teaching and Learning

What is also becoming evident is that the use of assessment practices by classroom teachers can

have powerful effects in terms of student learning. This conclusion gained great attention in 1999 with the publication of the work of the Assessment Reform Group (ARG) out of the United Kingdom. The ARG researchers found that improving teachers' classroom-based assessment practices could have an impact on student learning equivalent to a year of instruction. This finding generated considerable interest among researchers, practitioners, and policy makers, alike. The seminal publication of the ARG marked the beginning of more than a decade of focused attention on such related topics as classroom assessment, formative assessment, and assessment *for* learning.

More recently, a number of scholarly works have been published with the intent of synthesizing the bodies of research and scholarship related to teachers' assessment practices (e.g., Andrade & Cizek, 2010; McMillan, 2013). A review of these works makes evident a few key themes. First, there is a strong theoretical foundation supporting the role that effective classroom assessment practices can play in the learning and achievement of students. Second, there is a significant need for empirical research to bolster this theoretical position. And, third, while the field of educational testing and measurement has become more sophisticated and robust during the past half century, our understanding of the effectiveness of specific assessment practices for pre-service and in-service teachers is still relatively nascent.

Assessment as a Relative Weakness

While classroom assessment is evidently important to teaching and learning, it is also a relative weakness among many teachers. Research from more than 20 years ago bears this out (Stiggins & Conklin, 1992). Despite this long awareness, the evidence that teachers continue to be ill-prepared in the domain of assessment persists to the present day. For example, ten years ago, an empirical study of in-service teachers in Virginia found that assessment was the least adequately documented domain of teaching responsibility among the sample (Tucker, Stronge, & Gareis, 2003). In an anecdotal accounting of the state of public education in the U.S. in the popular book *Results Now* by Mike Schmoker (2006), the author observed that it was "apparent that student assessment was surprisingly rare and haphazard.

Students would spend days, even weeks, on activities without being assessed” (p. 86). That same year, an empirical study of novice teachers concluded that assessment was the weakest competency among first-year teachers (Good, McCaslin, Tsang, et al., 2006). In 2013, a review to the state of teacher preparation for classroom assessment in the *Journal of Teacher Education* concluded that “despite assessment education efforts, beginning teachers continue to feel unprepared to assess student learning” (DeLuca & Bellara, 2013, p. 357).

In summary, there is evidence that teachers’ assessment practices in the classroom can have a significant impact on student learning, but we have not had a clear understanding of what those assessment practices should necessarily be nor have we done a particularly good job of preparing teachers to engage in these practices as in-service teachers.

Current Standards for *Assessment Literacy*

Given the need for teachers to develop competencies related to the use of assessment in the classroom, there have been recent calls to define and to develop teachers’ *assessment literacy*. Although there is not currently a universally agreed upon definition of the term, *assessment literacy* can be defined as the creation and use of the spectrum of assessment techniques and instruments as part of the teaching-and-learning process. Another way to understand the term is by way of analogy. *Literacy* refers to one’s ability read, write, and orally communicate in order to get along in the world. Similarly, *assessment literacy* refers to a teacher’s ability to create and use assessment practices in order to progress student learning in the classroom.

One of the early uses of the term *assessment literacy* was by Rick Stiggins in a 1991 article in *Phi Delta Kappan*. More recently, the term has been used by the Council for the Accreditation of Educator Preparation (CAEP) to describe the essential knowledge and skills in the domain of assessment of which novice teachers must demonstrate mastery prior to completion of their professional preparation. In a report by the firm Measured Progress commissioned by CAEP, the authors concluded

that the preparation of teachers in assessment literacy historically has been “incomplete and superficial” (Kahl, Hofman, & Bryant, 2013, p. 3). Hence, the report recommends that teacher educators “flesh out the domain of assessment literacy into a coherent and comprehensive set of objectives and learning targets to provide specificity need for designing effective curricula, instructional materials, practica, and formative and summative performance measures” (Kahl, Hofman, & Bryant, 2013, p. 3). To that end, the authors present a conceptual framework for assessment literacy that focuses on three broad domains of competency for teachers and educational leaders. These three domains are (1) types of measures, (2) quality of measures, and (3) results and their uses. Additionally, the framework posits that these domains must be relevantly and accurately applied to three levels of assessments, namely formative assessment practices in the classroom, summative assessments in the classroom, and external standardized assessments used by teachers and school leaders alike (Kahl, Hofman, & Bryant, 2013).

More specifically, the CAEP report on assessment literacy states, “Teachers must be able to create/select and effectively use classroom assessments for a variety of purposes” (Kahl, Hofman, & Bryant, 2013, p. 5). Doing so requires specific knowledge, such as an understanding of the purposes and limits of item and assessment types (i.e., select-response, constructed-response, and performance tasks), as well as practical conceptualizations of the principles of validity and reliability as they apply to teacher-made assessments. According to the CAEP report, assessment literacy also demands that teachers have mastery of certain skills, such as being able to unpack standards both for content elements and for clarity of the target cognitive level. Assessment literacy also requires practiced skill in ensuring the technical adequacy of classroom-based assessments in terms of construct alignment, and assessment literacy requires that teachers be able to use data to inform instruction, including providing accurate, relevant, and constructive feedback to students in order to progress their learning.

One Current Approach to Developing Assessment Literacy

In this section, we describe one current approach to developing assessment literacy within the context of a state-approved, nationally accredited preparation program for elementary and secondary

teacher candidates. We make no claims that the approach is transferable to all settings, nor do we suggest that it is necessarily the best or only way to prepare novice teachers. However, we are confident (and we have some evidence) that the approach has both theoretical merit and actual impact on improving teachers' knowledge and skills in the domain of assessment literacy. We will touch on these points as we present an overview of our approach.

Before describing the approach, it is important to provide some background and then some context. Regarding background, the approach presented here was developed out of work that we have undertaken with in-service teachers beginning ten years ago and continuing to the present. Specifically, a number of our K-12 partners in the field recognized the relative weakness of their teachers in the domain of assessment and brought us in to assist. Our work with in-service teachers began on a very small scale, collaborating with an interdisciplinary team of three middle school teachers and their principal (Holler, Gareis, Martin, Clouser, & Miller, 2008). It has since grown into a refined model of professional development that we have undertaken with literally hundreds of teachers in schools, whole school divisions, state agencies, national conferences, and even international settings.

Regarding the context of our approach to the preparation of teacher candidates, it is important to note that a core piece of the assessment literacy competencies are currently addressed within a one-credit course, which meets five times for a total of 12.5 contact hours. Currently in the Commonwealth of Virginia, teacher preparation programs at the baccalaureate level are capped in terms of the number of education credit hours that may comprise the program. Consequently, very intentional decisions about what is taught and how it is taught must be made, and every choice to add to the program necessarily results in a decision to subtract something else. While our program had a long-held practice of integrating assessment competencies into instructional methods courses, we had recognized that classroom assessment was a relative weakness in our program. Thus, we developed a course on classroom-based assessment, but had to limit it to the one credit that we could extract from an already full curriculum for professional preparation. As a one-credit course (and as a professional development

series for in-service teachers), our approach had to be very tightly focused on what we believe are the core competencies (*not* the comprehensive competencies) of assessment literacy.

Conceptual Framework of the Approach

The conceptual framework of our approach to assessment literacy is driven by our definition of *assessment literacy*:

A teacher's knowledge, skills, and wherewithal to construct and use relevant and dependable assessment instruments and techniques as part of the teaching process in order to progress students' learning.

Similar to the conceptual framework of assessment literacy posited by the CAEP report, our conceptual framework also focuses on a limited number of high-leverage concepts and skills, which can be broadly outlined as follows:

1. Unpacking curricular objectives for students, with particular focus on targeted cognitive behaviors
2. Creating and using a table of specifications to guide the construction of an assessment
3. Using a table of specifications to critique and improve current assessments
4. Creating and using select-response items (including "technology-enhanced items") and constructed-response items
5. Using a table of specifications to conceptualize a unit assessment plan, with particular focus on the role of performance-based assessments to tap important objectives at the highest cognitive levels
6. Using a table of specifications to analyze student learning in order to communicate the nature and degree of learning to others (including providing constructive feedback to students), to make instructional decisions (in the near- and long-term), and to critique and improve teacher-made assessments for future use.

As may be apparent from this outline of key competencies, we view the creation and use of a *table of specifications* (TOS) as a critically important skill in the practical development and employment of assessment in the classroom. Yet the introduction of TOSs to teacher candidates is not new. The use of TOSs has been around since the advent of the first standardized assessments in the early 1900s. However, our experience suggests that this tool has typically not been put into the hands of teachers in a way that provides much utility. Our experience is reflected in the relative lack of emphasis that TOSs have in the published resources typically used in the preparation of new teachers. We recently undertook a content analysis of a convenience sample of 52 books on assessment. Of those, fewer than half (48%) mentioned “tables of specifications” (or equivalent terms such as “test blueprint”). What’s more, of those that did include some discussion of TOSs, the average number of pages within these books that was devoted to such discussion was approximately one percent. Clearly, TOSs are known about, but their practical or core value is just as clearly untapped.

What also may be apparent from our enumerated outline of key competencies of assessment literacy above is that the use of a TOS *to create an assessment* is only one of four practical uses that we believe a TOS can have. The other uses are *to critique and improve an existing assessment*; *to create a unit assessment plan* (that is, conceptualizing complementary assessments necessary to assess all of the objectives in a given unit, since a single assessment is not typically adequate); and *to analyze student learning*. In our content analysis of assessment books, we found that 88% mentioned the first and most common use of a TOS—creating an assessment. However, only 8% mentioned (much less described or demonstrated) how to critique and improve an existing assessment; only 20% mentioned using a TOS to conceptualize a unit assessment plan; and only 4% mentioned using a TOS to analyze student learning. This last finding is particularly troubling, because assessment in and of itself is a worthless activity. It is only the *use* of assessment results that can progress student learning. Since our aim is to prepare novice teachers who are ready to meet the inherent challenges of teaching real students on the first day of their

career, we believe our focus on developing a practical but grounded skill set in the creation and use of assessments is essential.

Two Essential Understandings of Assessment Literacy

While our approach is framed by the practical uses of a TOS, we are also very intentional about weaving two essential understandings throughout our work with teacher candidates. We use the image of “weaving” purposefully because our approach involves introducing these two elements and then returning to and emphasizing them repeatedly throughout the course. These two essential understandings are (1) operationally defining *validity* and *reliability* in very practical terms and (2) understanding the central importance of *alignment* among curriculum, instruction, and assessment. We briefly explain these here, although we recognize that our discussion is not adequate to the multifaceted elements of each of these essential understandings.

The principles of validity and reliability are staples of any assessment course, and they are typically introduced early in the study of assessment. What’s more, we have yet to meet a teacher candidate who did not know these terms *before* beginning their teacher preparation coursework. However, we have also noticed a strong trend among pre-service (and in-service!) teachers, which is that most are unable to clearly differentiate between validity and reliability much less apply these core assessment principles to the creation and use of assessments in the classroom. For this reason, we take the perspective that validity and reliability are practical steps to which a teacher attends when designing, using, and then analyzing the results of assessments. By way of illustration, consider the concept of *reliability*, which is typically defined as *the consistency of results on an assessment*. When this concept is introduced in many assessment courses, explanations about standard error, reliability coefficients, and the like are often made. While such topics are, indeed, concepts and considerations related to reliability, we believe they have little practical utility for a classroom teacher. Therefore, we define reliability differently:

Reliability is the degree to which a student's results on an assessment are not unduly influenced by chance, systematic error, bias, or cheating.

Conceptually, our definition is the same as any conventional definition of reliability. What is different is the directionality that it implies. Our approach is to have teachers think in practical terms about what steps they can take in the creation, administration, grading, and use of assessments to control the inevitable presence of random chance, systematic error, their own biases (or the biases of commercial publishers), and student cheating. When a teacher has some confidence that these influences are reasonably controlled, then she can have greater confidence that a given student's results are indicative of their actual learning, which, in a nutshell, is what we mean by *reliability*.

A second essential understanding woven throughout our conceptualization of assessment literacy is the principle of alignment, namely alignment among curriculum, instruction, and assessment. Returning to the enumerated outline of our conceptual framework, the first "step" in creating and using assessments is to "unpack" the curricular objectives of a unit of instruction. The process of unpacking curriculum requires considerable subject-area expertise on the part of a teacher, as one must accurately identify the content of the intended learning as well as the targeted cognitive level of performance. (Additionally, one must consider developmental appropriateness and also understand the position of the particular set of objectives with the vertical and horizontal articulation of the K-12 curriculum.) Having teacher candidates master the complex skill of unpacking curricular objectives for content and cognitive level of demand is a key step in developing assessment literacy, but, in doing so, an essential understanding begins to emerge. That understanding is that if the intended learning outcomes for students (i.e., *curriculum*) involves a given set of content with which students are engaging at particular cognitive levels, then an assessment of students learning should not only address that same content but should also have students doing so at the intended cognitive levels. When we work with teacher candidates (as well as in our work with in-service teachers), we repeatedly highlight each time their discussions of assessment lead to discussions of curriculum, which, in our experience, inevitably lead to

considerations of instruction, too. In short, we emphasize the essential understanding that curriculum, instruction, and assessment are simply different manifestations of the same thing. A helpful analogy is the three states of matter: liquid, solid, and gas—the same thing, but in three different forms.

Throughout our work with teacher candidates, the “elements” of intended content and targeted cognitive level of demand of the objectives are what must remain the same regardless of whether we are considering what we intended students to learn (i.e., *curriculum*), how we’re going to help them learn it (i.e., *instruction*), or how we’re going to determine the nature and degree of their learning (i.e., *assessment*).

Evidence of Impact

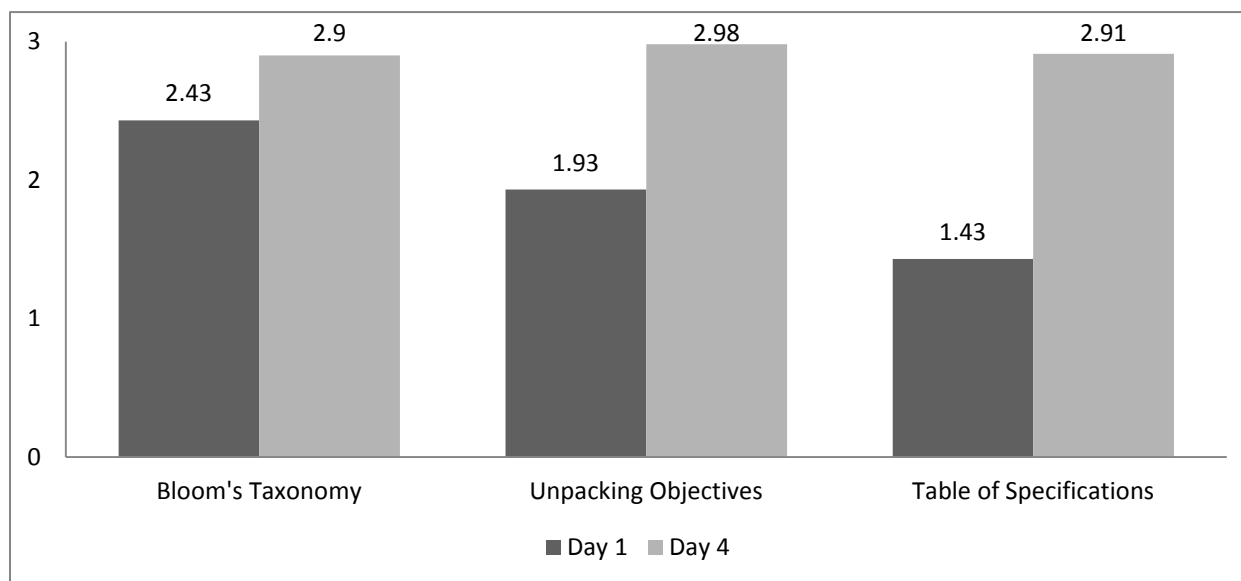
Weaving these essential understandings throughout our work with teacher candidates in developing their understanding and application of these four practical uses of a TOS represents the core set of knowledge and skills that we believe comprise assessment literacy. As previously explained, this currently occurs within our program within the structure of a one-credit course comprised of a total of only five class meetings over a five-week period. Due to the short duration of the course, every class meeting and assignment is designed with the intent of maximizing the leverage it provides in developing the assessment literacy of teacher candidates. For example, teacher candidates complete a series of scaffolded exercises, such as unpacking objectives, creating a table of specifications, critiquing an extant assessment, and creating various item types and justifying their validity and reliability in practical terms. Through these and other exercises, teacher candidates apply and extend their knowledge and skills of assessment literacy. In addition, we strongly believe that as instructors it is our responsibility to model these knowledge and skills and to share our thinking in developing assessments for the course and providing feedback.

One way that we have monitored the impact of the course design on candidates’ development is through self-reporting. Figure 1 presents one such sample from a cohort of undergraduate and graduate-level initial teacher preparation candidates in our secondary education programs in the spring of 2013.

On the first and fourth days of the course, candidates were asked to rate whether they *own*, *know*, or were *unsure* of each of three key concepts related to our conceptual framework of assessment literacy. (See the operational definitions of the three levels beneath Figure 1.) As depicted in Figure 1, these self ratings were converted to a 3-point numeric scale, and self-reported evidence of teacher candidates' learning is evident. Within this sample, teacher candidates had some sense that they already "owned" Bloom's taxonomy prior to instruction in the assessment class (anecdotally reporting that they were introduced to it in a previous educational psychology course); they "knew" about unpacking objectives; and they were "unsure" about a table of specifications. By the end of the fourth day of the course, teacher candidates indicated strong ownership of each of these key concepts.

Figure 1

Mean of Teacher Candidates' Self-reported Understanding of Key Concepts (n=42)



3-point self-report scale:

- 3 = I "own" this concept and could provide a clear explanation and examples to someone else.
- 2 = I "know" with concept, meaning that I am familiar with it, but could provide only a limited explanation.
- 1 = I am "unsure" about what this means and could not confidently provide an explanation or illustration to someone else.

Figure 1 represents only one cohort, but we have collected similar data with previous cohorts, elementary teacher candidates, and even from in-service teachers when we lead similarly structured professional development initiatives. The pattern depicted in Figure 1 is consistent with every group of

pre-service and in-service teachers with whom we have worked, which suggests to us a clear impact on teachers' understanding of these key concepts.

Strengthening teachers' understandings is necessary but not sufficient in developing their assessment literacy, since, by definition, assessment literacy must be applied. In our work with teacher candidates, there are two culminating assignments that they must acceptably complete in order to pass the course. First, candidates create a paper-pencil unit assessment using the principles and processes they have practiced through in-class activities and follow-up exercises. The central tool that they use is the table of specifications, which serves as the means through which essential elements such as validity and reliability are attended to in practical ways. Additionally, the original assessment must be accompanied by a narrative explanation of the purposes, structure, validity, and potential reliability of the assessment. Of course, we use an aligned rubric to evaluate teacher candidates' products, and they must meet or exceed expectations as operationally defined on the rubric. Through this culminating assignment, we have evidence that teachers are able to construct valid and reliable classroom-based assessments.

The second culminating assignment in the course is for teacher candidates to administer their original assessment in the field. Then, guided by four focused prompts, teacher candidates (1) analyze student results in the aggregate and draw inferences about student learning, (2) analyze the learning of two or more individual students and draw inferences about their learning, (3) make instructional decisions about what to do in the near term and what to do in the long term based upon the inferences they have drawn, and (4) critique the evidence of the validity and reliability of their assessment and revise the assessment accordingly for future use. This second culminating assignment represents a significant indicator of a teacher candidates' assessment literacy, for through this process, they are making use of student results on an assessment for purposes of progressing the students' learning. Similar to the assessment creation assignment, the assessment analysis assignment is graded using an aligned rubric, and teacher candidates are required to meet or exceed expectations in order to pass the

course. Since the course is required in order to complete the teacher preparation program, we ensure that each graduate is able to demonstrate the ability to analyze and use assessment results. In short, they are able to use assessment *for* learning (Earl, 2003).

Implications for Improving the Assessment Literacy of Novice Teachers

In 2008, Rick Stiggins published a white paper titled *Assessment Manifesto: A Call for the Development of Balanced Assessment Systems*. In it he made this clarion call:

I issue this assessment manifesto because I believe that we have reached a tipping point in the evolution of our schools when we must fundamentally reevaluate, redefine, and redesign assessment's role in the development of effective schools. The work to be done is so crucial as to require urgent pedagogical, social, and political action. (p. 2)

Stiggins went on to make three key points: (1) We must always be clear about our purposes when assessing student learning; (2) assessment should always be used to inform instructional decision making and, in turn, student learning; and (3) the current era of accountability has co-opted and misused "assessment," necessitating a reclamation of effective classroom-based assessment practices by teachers.

We agree, and, as we reflect on our respective roles as teacher educators, we would add these final thoughts to clarify our sense for our role. First, assessment should not be considered an after-thought of instruction, a necessary evil, or something that is done in order to put a grade in the grade book. In other words, there are innumerable *misuses* of assessment in classrooms. Since much of what teacher candidates know about assessment is based upon their own experiences as students, we sometimes have to undo the previous learning that has occurred with many of our candidates. To reiterate an earlier essential understanding at which we aim, assessment must ultimately be made integral to instruction. A second thought is that a great deal is already known about assessment as a field of research and scholarship. However, collectively, we have not done a particularly good job heretofore of translating this body of knowledge into practices that work for novice teachers. As teacher educators, we believe this is one of the great challenges that is before us, and, as we undertake this, we must always

ensure that the principles, tools, and strategies that we aim to develop in our teacher candidates are not only appropriate and technically adequate, but also feasible and, ultimately, useful to the process of teaching and learning (Joint Committee on Standards for Educational Evaluation, 2003). Third, to reiterate a point from the introduction to this article, the approach that we have described is couched within a one-credit course. Such a short duration is not wholly adequate to the development of assessment literacy, in our judgments. Were we to expand the course by two credits, we would strengthen the attention given to item construction, performance-based assessment practices, grading practices, and analyzing results of curriculum-based standardized assessments (such as the Standards of Learning tests). Finally, we saw in ourselves many years ago that our own assessment literacy was lacking, and we took it upon ourselves to change that through action research, empirical research, collaboration, and application to our own practice. For many of us in teacher education, assessment literacy is, indeed, a relative weakness. Therefore, it is incumbent upon us to develop our own competencies in this domain so that we are able to model and teach best practices to current and future teachers.

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