

Are We There Yet?
**Using Rubrics to Support Progress Toward Proficiency
and Model Formative Assessment**

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Abstract

Classroom assessment, especially formative assessment, is one of the most challenging areas for new teachers, so it is imperative that teacher educators model effective classroom assessment practices. This article describes the use of rubrics in formative assessment, to support candidates in their progress toward mastery of course outcomes and to model effective formative assessment. A rationale for the use of rubrics in formative assessment, embedded in the literature, is followed by an example of how each author has used rubrics during the learning process to enhance learning and contribute to a supportive learning environment in their teacher education courses. Recommendations are made for requiring candidates to engage in rubric-based self- and peer evaluation and involving them in co-construction of rubrics.

Keywords: formative assessment, rubrics

This paper is a result of multiple conversations among the authors about how rubrics can be best used in undergraduate courses, both to improve our own instruction and to model effective assessment practices for our teacher candidates. Our interest in rubrics stems from our belief that all students can learn, and that our role as educators is to support students in their progress toward proficiency. These collaborative reflections have influenced our implementation of rubrics in ways that we believe have improved our instruction, enhanced our teacher candidates' learning, and given teacher candidates a greater role to play in assessment and evaluation. After summarizing the benefits of formative assessment and the advantages of using rubrics, we describe how we have used rubrics not only for grading assignments, but also as formative assessment to improve learning and to model effective implementation of formative assessment.

Literature Review

Assessment and evaluation are terms that are sometimes used interchangeably. We use McMillan's (2007) definition of classroom assessment as "the collection, evaluation, and use of information to help teachers make decisions that improve student learning" (p. 8). Evaluation is one step in the broader process of classroom assessment. Specifically, evaluation is the "interpretation of what has been gathered through measurement, in which value judgments are made about performance" (p. 10). Whether assessment is formative or summative, evaluation is the process by which assessment results are designated as excellent, good, acceptable, below expectations, or whatever indicators of quality are selected. Descriptions of these levels of quality are described on a rubric.

The role of assessment in the learning process has undergone a paradigm shift in past decades. No longer is it considered effective to "teach, test and hope for the best," using only summative assessment to determine end-of-term grades (Wiggins, 1998, p. 10). Summative assessment serves to document the learning that has occurred. Good summative assessment that allows for valid, reliable, and bias-free measurement and evaluation of learners'

progress toward desired learning targets (Angelo & Cross, 1993) will always be important. But formative assessment is now considered a central component of effective instruction.

Formative Assessment

Formative assessment is concerned with monitoring progress with the intent of gathering and sharing information that can be used to advance learning and improve future performances (Popham, 2011; Wiliam, 2011). Bell and Cowie (2001) define formative assessment as “the process used by teacher and students to recognize and respond to student learning in order to enhance that learning, during the learning” (p. 536). Indeed, Good (2011) suggests the use of an alternative, more accurate phrase, “formative use of assessment information” (p. 1), emphasizing that the main difference between formative assessment and summative assessment is in how the assessment results are used. Results of formative assessments are not included in end-of-term grades because grades are a result of summative assessment that takes place after learning has occurred. Formative assessment results are used to inform both the teacher and the student, who can then make corresponding adjustments to instructional strategies and study practices, respectively. Formative assessment is not a new phenomenon, but it has increased in prominence in recent years. Originally used in the context of classroom assessment by Benjamin Bloom in 1969 (as cited in Wiliam, 2011), formative assessment became especially prominent after Black and Wiliam (1998) published a landmark review of research on formative assessment, concluding that formative assessment plays an extremely important role in improving learning.

Using rubrics in formative assessment may also influence students’ motivation to learn (Wiliam, 2011). Stiggins and Chappuis (2012) claim that involving students in the process of assessment builds their self-efficacy, thereby creating an “emotional foundation” (p. 16) that explains the power of formative assessment. Based on a review of research on motivation, Pintrich (2003) identified several principles for the design of learning experiences

Kinne, Hasenbank, and Coffey

that enhance students' motivation. Two of these design principles are especially relevant to our work with rubrics: (a) "Use task, reward and evaluation structures that promote mastery, learning, effort, progress, and self-improvement standards and less reliance on social comparison or norm-referenced standards," and (b) "Provide clear and accurate feedback regarding competence and self-efficacy, focusing on the development of competence, expertise and skill" (Pintrich, 2003, p. 672). The first principle relates to rubrics because a rubric enables criterion-referenced evaluation by explicitly describing the criteria against which a student's work will be compared. Self-improvement is not dependent in any way on the performance of peers, but depends on the individual student's demonstration of proficiency. The second principle is similar; having established the criteria by which competence will be judged, feedback will necessarily focus on the degree to which competence has been attained. In a similar vein, McMillan (2007) claims that motivation is increased by assessments that are "(a) meaningful and authentic, (b) use immediate and specific feedback, and (c) use learning goals that incorporate specific performance standards" (p. 81). Moreover, how students perceive the classroom environment is likely to influence their motivation. "If students perceive the environment as supportive, motivation is likely to be enhanced..." (Ambrose, Bridges, Lovett, DiPietro, & Norman, 2010, p. 79). Using rubrics is one of the ways that Ambrose et al. suggest establishing a supportive classroom environment.

Advantages of Rubrics

Using rubrics has advantages for both the instructor and the students. The process of constructing a rubric for a particular project helps instructors to clarify the learning targets they wish to measure, which can in turn support the identification of authentic performance tasks (Andrade, 2005). Construction of a rubric requires clarity about the particular standards or criteria that should be measured and about the characteristics that would distinguish varying levels of quality.

When students' performances are evaluated with a rubric, the

rubric helps to ensure fairness in grading, bringing a level of objectivity to what might otherwise be viewed as subjective grading (Diab & Balaa, 2011; Reddy & Andrade, 2010). Using a rubric to evaluate student products facilitates giving targeted feedback to students (Andrade & Du, 2007; Schamber & Mahoney, 2006; Stevens & Levi, 2005; Schamber & Mahoney, 2006; Andrade & Du, 2007), because the characteristics that are deemed markers of each level of quality on each relevant criterion have been pre-determined in the process of rubric construction.

A few studies have explored students' perceptions of rubrics. Just as the process of developing a rubric helps the instructor to clarify his/her own expectations for a particular assignment, the rubric itself, when shared with students, helps students understand the instructor's expectations. Students felt the quality of their work was better when rubrics were used, but only if the rubric was available to students as they worked on the assignment (Reynolds-Keefer, 2010). Students also perceived that instructors who used rubrics were more likely to get graded assignments handed back more quickly (Reynolds-Keefer, 2010), and to give more helpful feedback (Reynolds-Keefer, 2010; Walser, 2011). They also believed that grading was more likely to be fair in classes where the instructor used a rubric to grade student products (Andrade & Du, 2007).

Some students in Reynolds-Keefer's (2010) study reported that having a rubric provided a reference point for communicating with the instructor. Instead of feeling that they did not even understand the assignment enough to ask questions, they had a concrete document from which to ask questions. This suggests that rubrics may help to improve communication between instructor and students, fostering a supportive classroom climate.

Given these advantages, it is surprising that rubrics are not used in all courses. Diab and Balaa (2011) surveyed the students in their courses and found that 97% reported that their rubrics were useful, but 80% had never before taken a class in which rubrics were used. When rubrics are used, they seem to be most often used in summative assessment to determine final grades on student products

Kinne, Hasenbank, and Coffey

(Tunon & Brydges, 2006). However, using a rubric in summative assessment does not preclude its use in formative assessment. When rubrics are discussed with students and are available to students while they are working on the assignment, the rubric can become an integral component of the instructional process (Andrade, 2005).

Although studies exploring how rubrics influence learning are few, there is some evidence that students invest more metacognitive effort, such as evaluating their own work (Bolton, 2006; Jonsson & Svingby, 2007), and earn higher grades (Andrade & Du, 2007; Howell, 2011; Andrade & Du, 2007; Vandenberg, Stollak, McKeag, & Obermann, 2010) when rubrics are provided. In reviewing research on the use of rubrics in formative assessment, Panadero and Jonsson (2013) found some evidence that the use of rubrics has a positive impact on student learning, especially when the rubric is used in a formative way in combination with metacognitive activities such as using the rubric as a frame of reference for required exercises in self- or peer evaluation. However, Reynolds-Keefer (2010) found that not all students reported taking the initiative to use the rubric to reflectively evaluate their own work before handing it in. The opportunity for self-evaluation afforded by the rubric was under-utilized by the students.

Rubric-Based Self-Evaluation and Peer Evaluation

Panadero (2011) defined self-assessment as "... qualitative assessment of the learning process, and of its final product, realized on the basis of pre-established criteria" (p. 78). This is not a process of rating or scoring one's own work; it is a metacognitive judgment of the degree to which one's work approaches some known criteria. Providing a rubric and discussing it together with students serves to make the pre-established criteria accessible to students for use in self-evaluation. In this way, the instructor provides an opportunity for students to begin to internalize the criteria, which may have a positive impact on students' motivation (Panadero & Alonso-Tapia, 2013).

Andrade and Valtcheva (2009) describe three critical steps in the

self-evaluation process. First, the instructor shares his/her expectations with students, usually through presentation and discussion of a rubric. Second, students look at their work, comparing it to those expectations. Third, students use what they learned in their self-evaluation to revise their work. The opportunity to revise and improve is critical, because students "...will not self-assess thoughtfully unless they know that their efforts can lead to opportunities to actually make improvements..." (Andrade & Valtcheva, 2009, p. 14). The same process is used in peer evaluation, with students looking at one another's work.

Using a rubric for self-evaluation should result in improved student performance, and the same should be true for peer evaluation. Diab and Balaa (2011) required their students to peer evaluate one another's work using a rubric the instructor provided. The students reported finding this helpful. The instructors observed that the rubric may have helped students to become more engaged in learning, as their undergraduate students demonstrated improved writing performance when they were required to engage in rubric-based peer evaluation. Cartney (2010) organized students into small groups to review one another's essays and provide feedback to one another. Students were unanimous in reporting that this exercise helped them to improve their essay. Some commented that it was not only the feedback that was received, but also the process of giving feedback on peers' work that contributed to their understanding of how to improve their own essay. Orsmond, Merry, and Callaghan (2004) provided training that introduced students to their rubric criteria for posters in a biology class, and then led them in working together to use the rubric to evaluate an exemplar before they engaged students in peer evaluation of one another's posters. On a feedback questionnaire administered afterward, students reported that the peer-evaluation process had promoted both dialogue and reflection and had moved them away from a mindset of "redoing" to one of "rethinking" (p. 288). That is, rather than making surface level improvements to improve their grade, students used the peer-evaluation process to think deeply about the quality of their work and how it could be improved, demonstrating what

Dweck (2007) refers to as a “growth mind-set” (p. 34).

In some instances, feedback from peers may be as beneficial as feedback from the instructor. Ozogul and Sullivan (2009) found that when teacher candidates had been trained to use a rubric to evaluate their peers’ lesson plans, the feedback provided by peer evaluations was very similar to the feedback provided by instructors. Teacher candidates were able to improve their lesson plans to the same degree, regardless of whether they received feedback from their peers or their instructors. Topping (2009) makes the important point that because of time constraints, more feedback—and more timely feedback—is likely to be available from peers than from instructors. Hattie and Timperley, in their 2011 review of literature on quality feedback, provide a strong argument that peers can provide effective feedback.

Using Rubrics in Formative Assessment – Our Experiences

For each of the authors, the use of rubrics has been something of a journey. Realizing that we should be modeling good assessment practice, particularly when working with students who were pre-service teachers (henceforth, candidates), we began using rubrics, but primarily in a summative manner. Although we did hand out the rubric in class as we explained the upcoming assignment, we assumed that candidates would, on their own initiative, use the rubric to self-evaluate their product before submitting it for grading. Our experience was consistent with the findings of Reynolds-Keefer (2010) – that a few candidates did this, but many did not. It was only as we graded candidates’ products that we discovered aspects of the rubric that they had misunderstood or interpreted differently than intended. In those cases, we either modified the rubric so we had an improved tool for the next group of candidates or made sure to discuss those aspects with candidates the next time. This meant that use of the rubric informed our continuing instruction with the next group of students, but it was not formative for current students. We came to realize that we wanted the rubric to not only help us in grading, but to help our students in learning. We

were eager for candidates to involve themselves in the evaluation process, but we had not explicitly invited their involvement.

Therefore, we set out to be more intentional about using our rubrics formatively, to support candidates in moving toward their ultimate target of demonstrating proficiency in the area being assessed. We have found it helpful to use an analogy developed by the third author when we introduce the concept of rubrics to candidates. This analogy, included as Table 1, uses the familiar idea of a road trip—a life experience to which our students can relate—to help students better understand the function of a rubric. By monitoring where their work is on “the map,” candidates are made aware of what is still needed to make progress toward the goal. As explained by Vandenberg et al. (2010), the rubric serves as a sort of global positioning system (GPS) guiding the candidate toward proficiency. This analogy helps to create a shared vision that allows for the possibility of bringing candidates into the process of co-developing a rubric. It also helps communicate to candidates the value of comparing their own work to the criteria on the rubric, just as one might compare the street signs one is driving past with the names of the streets on the road map.

Table 1

Analogy for a Rubric: Imagine that Your Task is to Get From Grand Rapids to Detroit. Here’s How a Rubric Might be Used to Evaluate Your Trip.

Grade	Outcome	Description
F	Grand Rapids	Because of a lack of understanding or effort, you spun your wheels and never really left Grand Rapids.
D	Chicago	It’s obvious you put a lot of effort into this trip, but you went in the wrong direction. You did not meet most of the intended goals.
C	Lansing	You’re headed in the right direction, but there is still a lot to do before you reach your destination.
B	Windsor	Whoa! You overshot the goal. An occasional side trip is to be expected (encouraged, even), but be aware.
A	Detroit	You made it! You provide an efficient and insightful route from Grand Rapids to Detroit.

Kinne, Hasenbank, and Coffey

Once candidates have been introduced to the idea of a rubric, they are better prepared to use a rubric to self-evaluate their own work. Rather than handing in an assignment and waiting for the instructor to inform them of their score, candidates who engage in self-evaluation changed their focus from “what’s my score” to “what did I do well and how could I do better,” thereby shifting the focus of evaluation from an implied norm-referenced focus to an explicit criterion-referenced focus, and simultaneously providing an opportunity to discuss these important assessment concepts. The goal in evaluating candidates’ work, both for the candidates as they self-evaluate, and for the instructor as he/she evaluates candidates’ products, becomes providing clear feedback about the performance while identifying potential areas for growth.

To this end, the second author began employing the rubrics shown as Tables 2 and 3 for candidate self-evaluation in a mathematics education course. His aims were twofold. First, he wanted to provide more timely feedback so candidates would be able to improve their performance within the 15-week time frame of the semester. Second, he desired to get candidates more involved in the assessment process. Roughly every other day, the instructor asked candidates to use one of these rubrics to evaluate their performance on a short quiz after comparing their work with an exemplar solution. To allow some autonomy and choice in this process, and thereby promote intrinsic motivation (Deci & Ryan, 1985), candidates selected which of the two rubrics they preferred to use. Both the product and the self-evaluation were then reviewed by the instructor. The process of candidates critically reflecting on their performance and comparing their self-evaluation with their instructor’s evaluation provided timely, targeted feedback on the strengths and weaknesses of their performance. It was particularly illuminating when a candidate identified a mistake as “minor” that the instructor would characterize as a significant misconception; these occurrences opened up wonderful learning opportunities, increasing both the amount and the academic quality of candidate-instructor interactions.

Although these rubrics were developed for use in a mathematics

education content course, with minor wording changes they could be used with various types of assignments or projects within a teacher education program. In an educational psychology course, rubrics like these could be used when candidates analyze video clips to discern students' developmental levels. In an assessment course, they could be used when candidates describe the benefits and challenges of different grading approaches. In a classroom management course, they could be used when candidates analyze the motivational theories underlying various classroom management strategies. In each of these settings, the instructor can encourage self-evaluation by providing the rubric to students at the time the assignment is explained and by explicitly inviting students to evaluate their own work against the rubric. To use rubrics for peer evaluation, we use an early due-date for in-class peer evaluation and a later one for instructor evaluation. We have found that using the rubric to guide an in-class exercise of peer evaluation promotes deep in-class discussions, supports growth, and results in stronger final products.

Table 2
First-level Holistic, General Rubric Used by Students to Evaluate Their Own Performance

Level	Description of Performance
3	Shows complete understanding
2.5	Made a trivial mistake; shows understanding
2	Good start; shows partial understanding or relies heavily on guess and check to obtain answers
1	Sustained effort; shows limited understanding
0	No sustained effort; does not show understanding

Table 3
Six-level Holistic, General Rubric Used by Students to Evaluate Their Own Performance

Level	Description of Performance
Distinguished 5	I demonstrated complete understanding. My answers and explanations are clear and correct. I could help others understand this.
Proficient 4	I demonstrated understanding, but made minor mistakes or portions of my explanation were unclear or missing details.
Nearing Proficiency 3	I made some progress and showed some understanding but I made a significant error, omitted part of the analysis, or my explanation was weak.
Limited proficiency 2	I struggled with this one. I have some correct ideas, but my response suggests I do not yet fully understand this concept or I did not have time to finish it.
Incomplete 1	My work suggests I may have some significant misconceptions to overcome regarding this topic.
0	I did not attempt this task, or I had no idea where to begin.

Our candidates' experiences using rubrics for self-evaluation and peer evaluation prepared them for the work of developing and using rubrics for formative assessment of their future PK–12 students' work. We have sometimes provided candidates with practice in rubric construction by involving them in the co-construction of rubrics. The second and third authors used this process to develop a rubric that would eventually become part of a new portfolio assessment based on accreditation guidelines for secondary mathematics field experiences. After introducing the accreditation standards, we collaborated with our candidates to draft language that would describe how high, medium, and low levels of candidate proficiency might appear in the context of their current field experiences. Co-constructing an initial draft of the rubric gave our candidates a voice in establishing the criteria by which their work and the work of future candidates would be evaluated, and it invited them more fully into the assessment process. Once the initial framework was established, the instructors worked to refine

the rubric before inviting candidates to offer a final review of the criteria we developed. Our collaborative effort struck a balance between empowering our candidates and heeding the cautionary advice offered by Wiliam (2001):

It is important to note that developing learning intentions or success criteria with students is most definitely not a democratic process. The teacher is in a privileged position with respect to the subject being taught and knows more about the subject than the students do, and it would be an abdication of the teacher's responsibilities to let whatever the students feel should be valued be adopted as the learning intentions (p. 59).

Wiliam's advice is relevant both to PK–12 teachers and to teacher educators. Inviting students to collaborate with the instructor in developing rubrics works well on aspects of the learning process that students are already familiar with such as engagement, online discussions, or presentations. Inviting candidates to co-construct a rubric for learning targets they are unfamiliar with is unproductive because they do not know what the road to proficiency looks like if it is a road they have never traveled.

Conclusions and Recommendations

We have found that the use of rubrics supports and improves our teaching effectiveness. When we used rubrics only for summative assessment, it improved the objectivity of our grading. But once we began to intentionally use rubrics in formative assessment and involved our teacher candidates more in the assessment process, we began to see marked improvements in their performance. As candidates spent more class time on self- and peer evaluation by applying the rubric criteria to their own work, they began to develop a better understanding of the criteria, and their performances improved. On writing assignments, we have found rubric-based peer evaluation to be very helpful to our candidates as they gain timely feedback they can use to revise, rethink, and refine their work prior to submitting it for grading. As we continue to use

Kinne, Hasenbank, and Coffey

rubrics for formative assessment, we are seeing candidates becoming more invested in their learning and more focused on their own improvement rather than simply striving for a particular grade.

Using rubrics in formative assessment has also influenced the affective aspects of our courses. Candidates who are regularly engaged in peer assessment become aware of both their own strengths and weaknesses and those of their peers. They develop a degree of trust of one another's judgments and learn to seek one another's input, becoming true collaborators in learning. As candidates are brought into the assessment process, they begin to understand that the professor is there to help them learn the content, not solely to judge the adequacy of their knowledge. As they come to see their instructor's eagerness to support their progress, they become more willing to ask questions and become more engaged in the course.

For teacher educators, the parallels to the PK–12 classroom are obvious. We want our candidates to use effective formative assessments, to engage their students in self- and peer evaluation, and to encourage their students to become more invested in their own learning. As we model these practices, we also need to make them explicit to our teacher candidates to increase the likelihood that they will implement effective formative assessment practices in their own classrooms. We believe that the use of rubrics can play a vital role in this process.

For teacher educators who are not yet using rubrics, we have several recommendations. First, beginning to use a rubric, even if it will be used only for summative evaluation, requires reflection on the essential elements of learning. In the process of developing a rubric, the instructor clarifies what knowledge and skills candidates are expected to demonstrate in the assignment or project. Thinking about one's current mechanism for assessing those elements and trying to characterize in words that which you typically see in a poor performance and that which you would like to see in an exemplary one is key. This process enables one to develop a rubric around these ideas, share it with candidates when the task is introduced, and use it to evaluate their submitted work. In our

Are We There Yet?

experience, the process of developing a rubric helps to clarify and communicate our expectations to our candidates. Applying the rubric to candidates' work and providing each candidate with a marked copy showing their evaluation against the established criteria enhances the feedback process. Using rubrics for summative assessment is a good way to begin, as it allows the instructor to make adjustments to the rubric before inviting candidates to use it for self-assessment.

For teacher educators who are using rubrics in summative assessment, we highly recommend explicitly engaging your candidates in rubric-based self- or peer evaluation. We predict this will have a positive impact on candidates' learning and will help them to become more invested in their own progress toward proficiency. This will require that the rubric be written in such a way that the levels are seen as supporting progress rather than just sorting levels of proficiency. It will also require that candidates be explicitly introduced to how rubrics work, understand what specific rubrics say, and be given a chance to apply the rubrics to their own work and make revisions as needed. Once candidates have practiced using a rubric for self-evaluation, we recommend engaging them in rubric-based peer evaluation. Our experiences have paralleled those of Orsmond, Merry, and Callaghan (2004) in that rubric-based peer evaluation has increased the level of our candidates' dialogue and discussion, thereby deepening their understanding of evaluation criteria.

We would like to emphasize that the rubrics we have presented here are not perfect. Each of us continues to review and revise our rubrics from semester to semester, and in doing so we continue to clarify our own expectations and the clarity with which we communicate them to our candidates as we strive for continued alignment with our desired learning outcomes. Our use of rubrics has become an important tool for providing clear feedback that our learners can use to improve their performances. Using rubrics has improved the quality of our teaching.

Finally, we are aware that rubrics are not all alike. The rubrics discussed in this paper are general rubrics, intended for use with

multiple assignments. Other rubrics may be “task-specific” (Popham, 2011). Such rubrics can be very useful and could also be used in formative evaluation. However, it is important to note that when rubrics are too specific, it becomes possible for students to use the rubric only as a recipe for a successful grade, without understanding deeper concepts they should be learning. Reynolds-Keefer (2010) referred to this as students using the rubric as a “map or laundry list of things that are required to complete an assignment” (p. 6). Still, depending on the nature of the content, the maturity of the students, and other factors, there may be situations in which a task-specific rubric is preferred.

We are also aware that the degree to which a rubric is helpful in improving our teaching is highly dependent on both the quality of the rubric and the way it is used. We agree with Mansilla, Duraisingh, Wolfe, and Haynes et al. (2009) that “the power of a rubric rests on the degree to which it captures meaningful dimensions of the work without which a quality product could not be achieved” (p. 337). To promote meaningful learning, students should complete authentic tasks and receive relevant, timely feedback on the important components of their work. We must also help our students develop the skills to evaluate their own work. This is true at both undergraduate and PK–12 levels. A well-crafted rubric can be a useful tool toward achieving those ends.

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Kinne, Hasenbank, and Coffey

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