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Creating Columns or Breaking Down Barriers:

A Self-Study into Exploring Rubrics

By

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Abstract

This was an action research based self-study project. This study explored three different types of rubrics developed to assess student learning and their use in my instruction. It consisted of a two-part exploratory cycle. Within each of the two cycles, I designed and implemented three different types of rubrics; *holistic*, *analytic descriptor*, and *single point*. Throughout this three-month project, I documented changes in my thoughts and in my actions and instruction. During this time, I journaled about the process, and within that, four themes emerged: *changes over time*, *theory to practice*, *rubric expectations and outcomes*, and *flaws and rules*. On finding that, I realized that initial expectations and outcomes rarely align. Even though I had planned to avoid flaws identified in the literature for building rubrics, I avoided them only partially. I also discovered that the theories embedded in my research framework, *constructivism* and *differentiation*, were deeply integrated into my research and practice.

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Chapter 1

Introduction

Background and Rationale

In the final summer of my master's courses, I remember being handed one of my final rubrics for this program. I was unfamiliar with this particular rubric then; however, it completely changed the course of my education and teaching. The rubric was called a Single-Point rubric. This small action set me on a path that took me into new depths of understanding through exploration and research.

Educators at any level can tell you their job focuses on ensuring that their students know and understand the content at the end of that lesson, unit, or course. Our job is to distinguish whether the students understand the content or if they are not quite achieving the intended goal. It may even look like some students surpass the goal while providing advanced evidence in their understanding. But, at the same time, other students show little to no understanding of that concept. So, how does a teacher communicate to a student that they have reached the expectation? This comes down to defining that expectation, what generally, is referred to as a certain level of proficiency.

Cambridge Dictionary defines *proficiency* as “the fact of having the skill and experience for doing something” (*Proficiency*, 2023). In the educational setting, teachers continuously check students' work to ensure they obtain and demonstrate proficiency in many instructional areas. They do this through various assessments, both informal and formal. Teachers also use

multiple tools to determine where the students are in their understanding and where they need to get them to be in the coming days and weeks.

In the book, *The New Art and Science of Teaching*, Marzano (2017) states that informal assessments are used as a 'barometer' to check for an understanding with the students in that particular classroom. Informal assessments can be used as quick checks to ensure that students progress at the right pace. These types of assessments can take on the form of exit tickets at the end of the lesson, a verbal question and response, or a fist-to-five type of exercise; this is a self-reflection type response from the students. Marzano explains that teachers use formal assessments to gain specific information from the student at an individual level. Formal assessments are typically more in-depth and can provide more significant details into the students' understanding.

As a way to measure proficiency in formal and informal assessments, Marzano (2017) uses proficiency scales. In my study, I used rubrics. According to Marzano (2017), "The terms *scales and rubrics* are frequently interchangeable, but there are important distinctions. Rubrics tend to be specific to one task ... A scale is more general and describes a progression of knowledge or skill" (p. 11). Proficiency scales focus on the progression of learning longer term, including more extensive standards. Rubrics concentrate on one specific task, like a particular type of writing or a specific standard or topic in a different subject.

Rubrics are road maps that help guide students to a proficient level of expectation for a task, set of tasks, or assessments. However, rubrics have become a broad target. Students can easily hit the target with little effort due to the broadness of this rubric. In this way, students can focus on the minimal requirements to achieve a passing score. If teachers do not build a

zero-score category into the rubric, they could reward points to that portion of the rubric. By including minimal descriptions, the teacher may unintentionally award more points to a student than what they showed as evidence of their skill mastery.

Statement of the Problem

In Popham's (1997) research, they explain that there are four different flaws within building rubrics. Popham calls these four flaws "task-specific evaluative criteria, excessively general evaluative criteria, dysfunctional detail, and equating the test of the skill with the skill itself" (pp. 73-74). Popham explains the intention of these flaws within rubrics. With task-specific evaluative criteria, they state, "A rubric's most important component is the set of evaluative criteria to be used when judging students' performances." (p. 73). Popham's concern here is that the evaluation of tasks can be too specific for that one performance.

Their second concern is connected to the excessively general evaluative criteria. "Many rubrics now being billed as instructionally useful provide teachers and students with absolutely no cues about what is genuinely significant in a student's response, and they offer teachers no guidance on the key features of the tested skill" (Popham, 1997, pp.73-74). Popham states that rubrics are being built to look good and act beneficial, but they are not achieving what they are meant to do. The third flaw states that rubrics are wordy, and all of the specific details add to the length of the rubric. When rubrics become too wordy, the amount of attention that the reader uses declines, as can the comprehension of that task. The fourth flaw is connected to creator error. The person creating the rubric falls under the impression that "the test is the skill itself" (p. 74). Rubric creators need to realize that test-taking skills are essential; they are, however, not the rubric itself. Popham gets to the point by saying, "The vast majority of rubrics

are instructionally-fraudulent. They are masquerading as contributors to instruction, when, in reality, they have no educational impact at all" (pg. 73).

After their work in 1997, Popham creates new rules for rubric creators to follow. In 2017, Popham proposed five new rules. These five rules are focused on skill-focused rubrics. They include, "Make sure the skill to be assessed is significant, make certain all the rubric's evaluative criteria can be addressed instructionally, employ as few evaluative criteria as possible, provide a succinct label for each evaluative criterion, and match the length of the rubric to your own tolerance for detail" (p. 210). Through these rules, Popham wants their audience to build rubrics that focus on the skill the teacher is testing. They also want their reader to check that the skill is essential. For the second rule, Popham wants the rubric builder to understand that all of the criteria built into the rubric needs be taught instructionally.

For the third rule, Popham expects the creator to use as few criteria categories as possible while still maintaining a well-constructed rubric. The fourth rule states that the labels for the criteria should be short and to the point. There is hardly a point in making these category titles seventeen word long. The description of the criteria should not be intertwined into the category title. Popham's final rule gives power to the rubric creator in terms of creating rubrics that match the tolerance of lengths in which they can handle. If the creator wishes to build lengthier rubrics, so be it. If they prefer shorter ones, that works too. As these rules were discovered late in my research, I discuss this more in my results.

Purpose of the Study

This project aimed to use self-study as action research to explore what the creation of different types of rubrics looked like in within my instruction. While comparing the benefits and

consequences of each rubric to themselves and their counterparts, I also looked at Popham's (1997) flaws to see if they existed within the creation of my rubrics. Popham leaves the reader with this warning "If these flawed rubrics are not rapidly replaced with instructionally helpful ones, then the educational promise of rubrics will surely not be realized" (p. 75). After exploring rubrics through two parts, six cycles, I compared my findings to those flaws. Did these rubrics still have the same four flaws, or did one rubric have better results? This project's design helped to find the answer to understanding if the rubrics I created were masquerading as fraudulent rubrics or if they had an educational impact, especially on myself.

Research Question

The research question that guided this study was:

- What does the process of exploring the use of several types of rubrics in my instruction look like?

Chapter 2

Literature Review

Introduction

Teachers have always been tasked with figuring out what their students know. As educators know, there are many ways to find their students' proficiency levels. A rubric is a tool to evaluate the quality of students' assignments or performances, see Figure 1 (Ito, 2015; Brookhart, 2013; Popham, 1997; Boer et al., 2021; Wolf & Stevens, 2007).

Figure 1

Analytic Rubric

Figure 1 Analytic Rubric

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Food	Most food is colder or warmer than it should be, is under- or over-seasoned, or is under- or overcooked.	Some food is colder or warmer than it should be, is under- or over-seasoned, or is under- or overcooked.	All food is at the correct temperature, adequately seasoned, and cooked to the eater's preference.	All food is perfectly cooked and seasoned to the eater's preference. Additional condiments are offered.	
Presentation	More than one item (tray, napkin, or silverware) are dirty or missing.	Tray, napkin or silverware may be dirty or missing.	Food is served on a clean tray, with napkin and silverware. Some decorative additions may be present.	Food is served on a clean tray, with napkin and silverware. Several decorative touches are added.	
Comfort	Wake-up is abrupt, little to no help with seating, and the recipient is rushed and crowded during the meal.	Wake-up is somewhat abrupt, recipient may struggle with seat adjustment, or there may be some rushing or crowding during eating.	Recipient is woken gently, assisted in seat adjustment, and given reasonable time and space to eat.	Recipient is woken gently and lovingly, assisted until seating is just right, and given abundant time and space to eat.	

Note: This is an example of an Analytic Rubric. (Know Your Terms, 2014)

For this literature review, I introduced my theoretical framework first to present a background of what ideas for this project were used. Then, I explain the history of rubrics. Next, I describe the three types of rubrics that were explored in the overall project, looking at the benefits of their use and the consequences of each rubric. Finally, I provide background for the backwards design process and justify how I integrated this process into this project.

Theoretical Framework

For this research, I used the lenses of constructivism and differentiation. "Constructivism is the theory that says learners construct knowledge rather than just passively take in information" (*Constructivism*, 2022). When someone provides a learner with new information, they rely on any prior knowledge to help establish those new connections within the brain. For example, when construction on a new building begins, the builders start at the foundation and work their way up. As construction on the building begins, new material is included. The new material adds to the overall appearance and functionality of that building. The foundation is a crucial part of the learning. Everything that comes after that foundation relies upon that previously constructed information.

Kindergarten is the formal foundational building blocks in a students' career. Everything the student learns is tied back to that basic information. Once that person leaves an educational setting, this theory is practiced continually. "Knowledge is constructed by learners, and so they need to have the opportunity to construct by being presented with goals and minimal information (Kirschner et al., 2006). So, constructivism is basically a philosophical theory of learning that goes way beyond K-12 education. It encompasses everything that

learning brings to a learning situation; this is the framework for new knowledge. Kirschner states that the information a learner starts with is minimal but also needs goals.

Differentiation was the second lens used in this literature review. “Differentiated instruction is a philosophy of teaching purporting that students learn best when their teachers effectively address variance in students’ readiness levels, interests, and learning profile preferences” (Tomlinson, 2005). This theory states that not every learner is in the same place with their background knowledge. Each student comes to the classroom with different ideas, experiences, or connections to the concepts discussed in class. These experiences are where constructivism and differentiation overlap. Differentiation further states that some learners need extra support to reach their educational goals. While others require little support reaching similar goals, they may need help extending their knowledge or finding new ways to express that knowledge.

Both theories root themselves within the rubrics. Constructivism has students take minimal information and build upon those beginning ideas. With rubrics, minimal knowledge results in an overall score of Basic or Below Basic for that specific category. Differentiation states that to move beyond basic learning, teachers need to create new ways of piquing interests or readiness levels. Teachers must consider these to help deepen a student or knowledge. Not every student has the same background knowledge at the beginning of the lesson, this is where constructivism and differentiation overlap. In society, buildings start with a foundation and build upward. In a learning setting, new pieces of information establish the beginnings of a new foundation or are directly tied to other related information. Ultimately, how that specific learner builds their tower of knowledge will look different from their peers,

depending on the connections they made along the way. The goal is to have the same information in each learner's building. However, the outside of that building can look remarkably different. As an educator in the classroom, both of these theories play an important role in creating rubrics.

History of Rubrics

Croenen (2018) reminds their readers that the initial use of the word rubric depends on its origin of use. “‘Rubric’ is the vernacular equivalent of the Latin term ‘rubrica,’ derived from the adjective ‘ruber,’ meaning ‘red’ or ‘ruddy.’ The vernacular and Latin forms ‘rubric’/‘rubrica’ are polysemic and potentially ambiguous. In classical Latin, ‘rubrica’ refers to a range of different but related realities” (2018). Other sources (Lee, 2021; *Rubric | Etymology, Origin and Meaning of Rubric by Etymonline*) state that the word rubric comes from the 13th century, where its origins connect to the word red. In religious texts, the authors wrote the directions in that color.

The word holds true to its roots of being red lettering and transitioned into headings. “Chronology and geography of the changes that seem to have led to a much more generalized presence of rubrics in books in the 13th, 14th, and 15th centuries” (Croenen, 2018, p. 1). Over time, the word took on a new identity; rubricators and rubrication. Rubrication was the decoration of text in red ink by other individuals (2018). Rubrication is where some of the book headings appeared with red lettering. Eventually, these red headings transitioned into what worked as chapters. The author initialed their work, and the space after their initials became a natural break, indicating that it was the beginning of a new chapter. “Adding a system of rubrics to historical vernacular texts not only made them conform to expectations about luxury

vernacular manuscripts, it also had the particular advantage of making them look more like the Grandes Chroniques de France, the historical bestseller produced by the Parisian book trade from the 1390s onwards" (Croenen, p. 13). The beginnings of conforming to expectations start here. Beyond this period, the literature only provides a few details from the 15th century until the 20th century.

By 1912, Noyes referenced the work of Columbian University Professor Thorndike and a colleague, Hillegas, in creating a measurement tool for grading writing. Noyes wrote, "In nearly every form of human effort except teaching, the efficiency of different methods of procedure can be and is tested by results" (Noyes, 1912, p. 532). Like in science, Noyes wanted a tool or scale to compare other students' writings. Noyes used the example of a thermometer to help make their point about why measuring and comparing scores on the same scale were so important. If Centigrade and Fahrenheit are the scales used, an everyday basis and understanding is established within both systems. However, Noyes stated that two teachers had different grading scales. Professor Thorndike and Hillegas showed a scale that, if used by teachers, worked effectively as a comparative tool in writing. Professor Thorndike and the team saw this comparison system moving beyond the schools' walls and into the workforce. The word rubric slowly faded into the educational background for a few decades.

Throughout the 1970s, 80s, and 90s, fears of the levels at which students performed rose to the surface. (Weiss et al., 2002) These concerns brought about the discussion of expectations set up for graduation. When expectations at the end of one's schooling increase, so too shall the other expectations down the line follow. One way to ensure students met these

expectations came through assessments. The system needed a standard measurement tool to compare data such as this. That tool brought about the return of rubrics.

Rubrics returned to the educational scene in the early 1990s with a more significant and lasting impact (Lee, 2021). Lee also states that this is where the word rubric starts as a pedagogical term that is synonymous with grading scales. According to Guskey (2017), the educational system focused on the standardization of learning and ways of assessing that learning. These changes in the system brought changes in action. In the 1990s, the typical grading scale (As, Bs, and Cs) shifted into standards-based grading. This change brought the usage of rubrics into the classroom (Conley & Darling-Hammond, 2013).

Using data gathered from multiple-choice assessments turned into building portfolios for students to be used as long-term data collected throughout that student's career. "This portfolio includes a set of ambitious performance tasks—a scientific investigation, a mathematical model, a literary analysis, and a history/social science research paper, sometimes augmented with other tasks like an arts demonstration or analyses of a community service or internship experience" (Conley & Darling-Hammond, 2013, p. 8). If a new depth of grading these portfolios were the overall desire, commonly built rubrics became the response to that desire. As these new portfolios became the goal, the teachers had their students practice with this type of learning and these assessments throughout the year.

As classrooms changed in the 1990s, so did the government and its mandates. 2002 brought the enactment of the No Child Left Behind (NCLB). NCLB increased teachers' expectations and punitive measures if they did not achieve the success the governing body expected. To show that teachers met these mandates, they started looking for standardized

ways of measuring their students. This is how the standardization of goals and assessments led to rubrics being used more frequently in the classrooms. As education moved deeper into standardization of assessments and standards alike, educators knew that rubrics would be around well into the future.

Purpose of Rubrics

Rubrics are measurement tools used in the evaluation of the work completed. (DeBoer, et al. 2021; Popham, 1997; Wolf & Stevens, 2006; Ragupathi & Lee, 2020). "Rubrics represent not only scoring tools but also, more important, instructional illuminators. Appropriately designed rubrics can make an enormous contribution to instructional qualities" (Popham, 1997, p. 75). Popham (1997, 2017) explained that rubrics must have "three essential features: evaluative criteria, quality definitions, and a scoring strategy." In 2017, Popham updated these features with new terminologies to *multiple evaluative criteria*, *prespecified quality standards*, and *judgmental appraisal*, respectively. For the rubrics to be effective, the evaluative criteria must have distinguished acceptable responses. Each evaluative criterion must represent a vital attribute of the skill tested, and these attributes be 'teachable.' Popham expanded this idea by stating the work that the student has completed "must be judged using more than one evaluative criterion" (Popham, 2017, p. 197). Teachers needed to help their students increase the skills being tested.

For prespecified quality standards, Popham (1997) explained that the definitions should describe differences in students' responses and the way those responses are held to a certain standard or judgment. If these definitions need to be clarified, the communication within this tool can lead to the students getting lost in what information they need to represent. These

ideas change slightly in the 2017 approach. They require that a teacher have clear expectations for the students and these expectations need to be ready before using them as a judgment or measurement tool.

Another critical part of rubrics is the judgmental appraisal. Popham explained that in 1997 there were two types of rubrics: holistic and analytic. Since then, the creation of a third rubric, the single point, has been added to the list of valuable rubrics. In 2017, Popham stated that selected-response types of assessments, such as scantron, multiple choice, and true-false, can be graded through a computer. However, in the case of performance-based assessments, they required a different way of measuring the outcome, the judgments that can only come from a person.

Types of Rubrics

Within this project, I used three different types of rubrics; *holistic*, *analytic*, (also referred to as an analytic descriptor) and *single point*. Gonzales, from Cult of Pedagogy (<https://www.cultofpedagogy.com/holistic-analytic-single-point-rubrics/>), provides details on these three different types of rubrics. The first rubric is called a holistic rubric. Popham (1997) explains that this rubric can provide a score based on the criteria as a whole. Gonzalez calls holistic rubrics a general type of rubric. They explain "it's the way the characteristics are all lumped together" (*Know Your Terms*, 2014). In Figure 2, Gonzalez provides an example of a holistic rubric for the expectations of having breakfast in bed. The example offers four different scores. The criterion is explained for each level generally to provide an understanding of the expectations.

Figure 2

Holistic Rubric

Figure 2 Holistic Rubric

Breakfast in Bed: Holistic Rubric	
Score	Description
4	All food is perfectly cooked, presentation surpasses expectations, and recipient is kept exceptionally comfortable throughout the meal.
3	Food is cooked correctly, the meal is presented in a clean and well-organized manner, and the recipient is kept comfortable throughout the meal.
2	Some food is cooked poorly, some aspects of presentation are sloppy or unclean, or the recipient is uncomfortable at times.
1	Most of the food is cooked poorly, the presentation is sloppy or unclean, and the recipient is uncomfortable most of the time.

Note: This is an example of a holistic rubric. The left column shows the overall score. The second column displays the descriptions to obtain the corresponding score (Know Your Terms, 2014).

The second type of rubric is an analytic rubric. "An analytic rubric breaks down the characteristics of an assignment into parts, allowing the scorer to itemize and define exactly what aspects are strong and which ones need improvement" (*Know Your Terms*, 2014). In Figure 1, there are three different categories that the scorer is looking for, using the same example of breakfast in bed. Gonzales used these three categories to break down the overall concept. Then they graded each category based on the evidence from that performance, independently from the other two. Across the top of the rubric, the scoring types include *Beginning*, *Developing*, *Accomplished*, and *Exemplary*. The goal for the performer would be to

reach a rating of accomplished or exemplary. For example, the performer can end up with a score of a beginning for the food category but can also score exemplary in presentation and developing in comfort. Again, each category is separate from the other.

The third rubric studied within the parameters of this project is known as a single point rubric. One of the original authors of single point rubrics, Fluckiger (2010), was introduced to the idea in 2000 while attending professional development. "The single point rubric is a tool for each student to indicate the following: a) I know where I am going; b) I know where I am now; c) I know how to get there; and d) I know how to go beyond" (p. 19). Taking the work of Fluckiger, Gonzalez explains, "A single-point rubric is a lot like an analytic rubric because it breaks down the components of an assignment into different criteria. What makes it different is that it *only describes the criteria for proficiency*; it does not attempt to list all the ways a student could fall short, nor does it specify how a student could exceed expectations" (*Know Your Terms*, 2014). In Figure 3, Gonzalez uses the same breakfast in bed example to show how the single point rubric looked. This type of rubric relies heavily upon feedback. Feedback is provided within the concerns column if the student performs in a way that misses the expectations. There is also an advanced column for students that went above and beyond the proficient-level expectations.

Figure 3

Single Point Rubric

Figure 3 Single Point Rubric

Breakfast in Bed: Single-Point Rubric

Concerns <i>Areas that Need Work</i>	Criteria <i>Standards for This Performance</i>	Advanced <i>Evidence of Exceeding Standards</i>
	Food: All food is at the correct temperature, adequately seasoned, and cooked to the eater's preference.	
	Presentation: Food is served on a clean tray, with napkin and silverware. Some decorative additions may be present.	
	Comfort: Recipient is woken gently, assisted in seat adjustment, and given reasonable time and space to eat.	

Note: For single point rubrics, there are three columns: Concerns, Criteria, and Advanced. The criteria are at the level of proficiency set for this rubric. In addition, anything the student shows that does not meet or exceed expectations is provided as feedback in the appropriate column (Know Your Terms, 2014).

Beneficial Impacts of Using Rubrics

All three rubrics presented above provide benefits as a whole or specific to their structuring. Wolf and Stevens (2006) state that using rubrics clarifies learning targets, guides instruction, provides a fairer approach to assessment and creates an opportunity for peer feedback and self-assessment. Overall, these tools have some benefits that they bring to the classroom. In, Know Your Terms, 2014, Gonzalez breaks down each of them.

Benefits of Holistic Rubrics. According to Gonzalez (2014), the main benefits of using a holistic rubric include timeliness and ease of scoring. Timeliness acts as a benefit in two ways.

First, the holistic rubrics demand a different amount of time to make. Secondly, grading this rubric takes less time. When it comes to grading, it ends up being a glance at the description and providing an overall score to the performer.

Benefits of Analytic Rubrics. There are benefits to providing students with analytic rubrics. "It gives students a clearer picture of why they got the score they got. It is also good for the teacher because it gives her the ability to justify a score on paper, without having to explain everything in a later conversation" (Know Your Terms, 2014). Analytic rubrics rely heavily upon the details of expectations. The descriptions provide clarity to the students in helping them understand the expectations and what evidence needs to be shown to obtain that score. Written feedback must be more detailed here, provided it appears within the description.

Benefits of Single Point Rubrics. According to Gonzalez (2014), single point rubrics have several advantages. Timeliness, wordiness, and open-ended feedback categories are some benefits. In, Know Your Terms, 2014, just like the holistic, the amount of time spent building this rubric is lessened. This directly connects the length of descriptions that the task performers need to provide, to time spent building the rubric. If a teacher can provide a manageable amount of detail, it becomes a shorter project. Students benefit from this because they are more willing to read the expectations. "Like holistic and analytic rubrics, a single-point rubric breaks down the assessment tasks into categories and outlines the standards for proficient student performance, but deliberately leaves open-ended the areas for success and shortcomings" (Ragupathi & Lee, p. 86, 2020). A benefit of this specific rubric is the open-ended columns for feedback.

Teachers do not have to guess where the pitfalls of their students might appear. Instead, they can provide honest feedback that helps the student progress toward proficiency. With that, teachers do not necessarily have to anticipate or define the levels in which their advanced students might ultimately be educationally. This leaves positive surprises to be discovered in the work of the student.

Consequential Impacts of Using Rubrics

The literature warns us that there are general detrimental flaws within rubrics. “Although rubrics are receiving applause from educators, the vast majority of rubrics are instructionally fraudulent. They are masquerading as contributors to instruction when in reality, they have no educational impact” (Popham, p. 73, 1997). This trap is what rubric creators need to be aware of. The creators think their rubric does what they intended it to do. However, that can be deceptive. Another issue with rubrics is that they “can act as a straitjacket, preventing creations other than those envisioned by the rubric-maker from unfolding. (“If it is not on the rubric, it must not be important or possible.”) The challenge then is to create a rubric that makes clear what is valued in the performance or product—without constraining or diminishing them” (Wolf & Stevens, p. 13 2007). Intention can go a long way in creating rubrics, but intentions are not always successful.

Consequences of Holistic Rubrics. One of the main consequences of using holistic rubrics is that all expectations fall into one category. This does not allow time nor space to provide specific feedback. “The main disadvantage of a holistic rubric is that *it doesn’t provide targeted feedback to students*, which means they’re unlikely to learn much from the assignment.” (Know Your Terms, 2014). Without providing feedback, it leads to students

guessing how their teacher concluded their final score. Another issue is that the teacher measured the student's work against one criterion category. Holistic rubrics do not break down the more immense expectations into smaller categories so students cannot figure out where they are successful or struggling.

Consequences of Analytic Rubrics. In, *Know Your Terms*, 2014, Gonzalez details two consequences that analytic rubrics bring with their use. First, they state that analytic rubrics take a lot of time. In taking time, teachers must provide all of the necessary detailed descriptors. All of the details within that particular rubric add to its overall length. The wordier and lengthier a rubric is, decreases the amount of time a student is willing to spend reading and understanding what the expectations are behind the rubric.

Consequences of Single Point Rubrics. For this type of rubric, Gonzalez (2014) only provides one consequence. In their research, they state that after the student has turned in their work, the teacher has more written feedback to provide than the others. Gonzalez says, "If a student has fallen short in many areas, completing that left-hand column will take more time than simply highlighting a pre-written analytic rubric" (Single-Point Rubrics, para 5). If a student shows above and beyond work, the same effort in written feedback needed to be provided.

Backwards Design

Backwards design is a process in which one plans their instruction looking for the desired results at the end of that lesson or unit (Martin et al., 2019; Ziegenfuss & LeMire, 2019; Graff, 2011, McTighe & Wiggins, 2014). For example, an educator setting up their weekly lessons starts with their end goal in mind. This starts with focusing on the standards or

objectives that the students need to know. This work can range in time. In some cases, there are 15-day plans that use backwards design. Other possibilities include a week-long plan. Backwards design “provides a structure with which to help prospective teachers in a content methods course to begin to transform their content knowledge into pedagogical content knowledge and to develop sensitivity to both the horizontal and vertical curriculum” (Graff, 2011, pp. 154-155). This transformation helps educators understand the why behind their work so that they can communicate it to their students. According to McTighe and Wiggins (2014), there are three stages to the backwards design process.

First, when starting, the planner needs to identify the desired results for their lessons. The main focus is on the students and figuring out what the students need to know by the end of the unit. The desired results are the ultimate goal; however, priorities must be set. Some expectations may not be as necessary, so they must be let go for now. It is important to remember in this process that students need to be able to transfer their knowledge or skills from this unit.

In the second stage, McTighe and Wiggins (2014) state that the assessment evidence needs to be determined. To figure this out, teachers can ask themselves, "How will we know if our students achieved the desired results?" (2014). By looking at the desired results and connecting those ideas to the end-of-unit assessment, teachers start thinking about what questions appear on the assessment. They will know how to get their students to the desired results when they understand the “what” that is being asked for on the assessment. This step happens before even looking at the specific lessons.

The final stage of backwards design is to 'plan the learning experiences and instruction' (2014). The question from this stage is, "How will we support our learners as they come to understand important ideas and processes?" (McTighe & Wiggins, p. 6, 2014). This is where the planning of the daily lessons or activities takes place. Teachers can design their lessons from the assessment backwards to the first lesson. By doing this, they ensure they know the desired results for the unit, have looked at or built the assessment needed, and have prepared lessons that act as intentional stepping stones to get all students to the final task or assessment with the same collective knowledge.

Conclusion

From the color red to the usefulness of a standardized measuring tool, rubrics have changed over time and have become an essential part of education. The benefits are many and the consequences are important to avoid. There are theories of practice that are deeply rooted within every rubric that was explored in the literature. Rubrics are powerful tools that educators need to take a closer look at.

Chapter 3

Methods

Introduction and Context

I created this project to answer the question, what does the process of exploring the use of several types of rubrics in my instruction look like? I chose action research as my framework because it provided a way to study the process of creating rubrics for the mixed-level science class I taught. In addition, self-study was a way to record and analyze my responses to developing and implementing the rubrics. I collected data for this project between January and March 2023.

I am a self-proclaimed "singleton." At my rural Wyoming school, I teach multiple subjects to mixed-grade classes. I am the only teacher in my building to teach those students that subject matter. This research provided a way to reflect on my practices and the creation, exploration, and usage of three different types of rubrics within the context of science.

Data Collection and Procedure

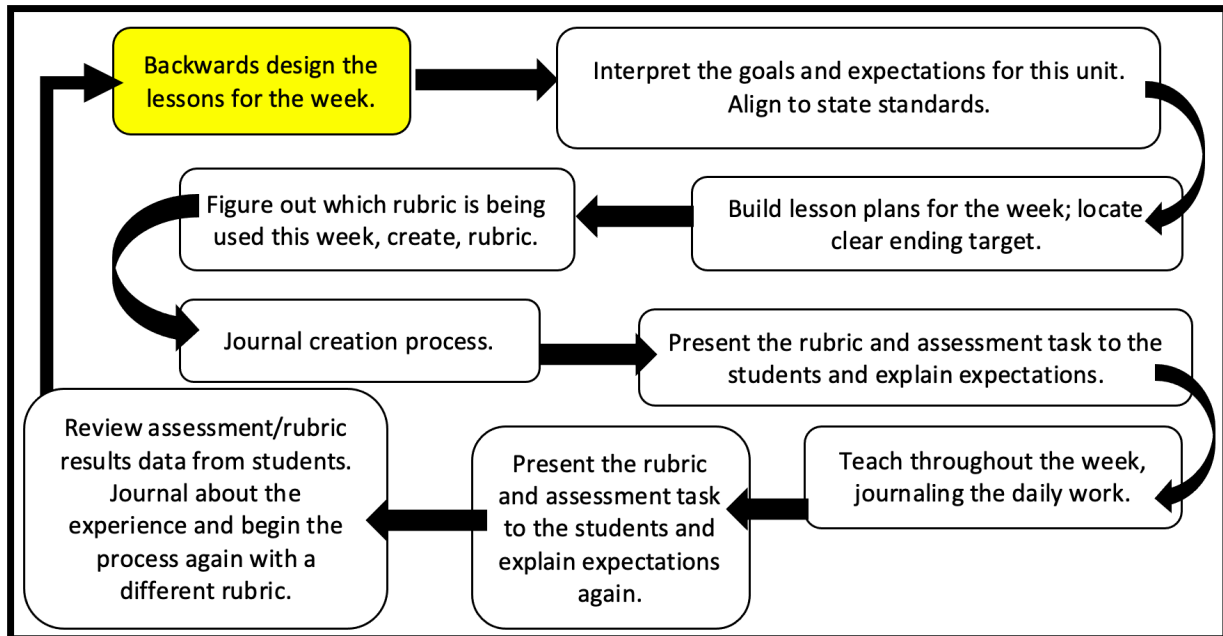
Starting in January, 2023, I mapped out my six cycles of study for my data collection process. Figure 4 shows how I set up the cycle based on my weekly lesson planning and the unit context. If the class were in the middle of a unit, I provided the rubric at the end of the week. If the class were at the beginning or end of a unit, I still provided the rubric at the end of that week. A total of six cycles were conducted. Each cycle involved exploring the material that I covered over that week. I mapped it out throughout my four-day workweek. Monday began the cycle and Thursday ended it. Wednesdays were our specials when students attended

Counseling, Music, and Library. If our specialists could not make it to our school, I pushed the science lesson forward one day.

Figure 4

Data Collection Procedure

Figure 4 Data Collection Procedure



Note: This figure shows the data collection process for each cycle. A total of six cycles were conducted, two for each rubric. The process began with the box highlighted in yellow. Created by John Beitler.

Qualitative Data Collection

Journaling

On Sundays, I started the cycle for the week (highlighted in yellow in Figure 4). First, I planned the main objectives for the week using the curricular program. Then, I checked the alignment of the standard(s) and compared them to what I covered for that week. Finally, I used the assessment boundary to guide my rubrics. On the right-hand column of Figure 5, after

completing the six cycles, I placed all my notes and observations in that column. Then, I used that data in a modified constant comparative process to identify themes.

Figure 5

Weekly Plans

Figure 5 Weekly Plans

Date: 1/8/23	Rubric: Holistic	Notes/Observations/Themes
<p>Planning it all out:</p> <p>For this week, I am tasked with creating a holistic rubric focused on the subject of photosynthesis. Along with this being a challenging area in terms of rigor and being abstract, I am a little nervous. The lessons are set up to look at how energy flows through the system as a whole. That is where my ideas are going to stem from in terms of expectations. The idea still relates to photosynthesis but hits more on the target of the standard.</p> <p>From STEMscopes (my curriculum): MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.</p> <p>Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.</p> <p>Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.</p>		<p>Holistic 1 Overall: Pros: Easy to use and create</p> <p>Cons: Too broad and lacked depth</p> <p>Holistic 1 and Holistic 2: Pros: Great introduction type of rubric, easy to use and build</p> <p>Cons: Lack of depth and keeping content broad was a challenge, especially if later in the learning cycle. Content can make or break the use of this rubric.</p>

Note: This figure is an example of my weekly lesson planning based on the curriculum program provided by the district. I added the notes, observations, and themes at a later time.

After reviewing the curriculum and unit expectations, I planned the following three lessons for the week, see Figure 6.

Figure 6

Backwards Design Process

Figure 6 Backwards Design Process

<p>Backwards design: Main focus for the unit: What do plants use for energy?</p> <p>Day 1: Investigative Phenomena - looking at video of sugar and connecting it to plant energy. Gaining student background knowledge on plant energy.</p> <p>Hook activity: Sunlight activity</p> <ul style="list-style-type: none">- Students will cut out construction paper and lay it on photo-sensitive paper.- Discuss the changes in the paper's color and the energy. <p>Day 2: Explore 1- Modeling Photosynthesis</p> <ul style="list-style-type: none">- Students will move through three stations creating water and carbon dioxide block models and grab photo block models.- Connect photosynthesis to a chemical reaction and the byproducts of that reaction.- Photons + water + carbon dioxide → glucose and oxygen gas.- CER (Claim, Evidence, Reason) - relate energy flows from plants being eaten by a rabbit where does the energy go how does the rabbit gain it? <p>Day 3: Explore 2 - Importance of light</p> <ul style="list-style-type: none">- Students will run an activity with light on and light off on an elodea	
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Note: This is an example of my thought process for backwards designing lesson plans. The end goal for the week contributed to what was on the rubric. Sample pulled from John Beitler's journal.

By starting with Thursday's lesson, I backwards designed the end goal for the week and identified the steps I took to achieve that goal successfully. That increased the chances of success for my students, making sure I had hit the points along the way. I knew those points were crucial for the students' summative assessment. Figure 7 shows an example of my observations of a week's sequence of lessons. Making and reviewing this information helped

keep me on track and provided information regarding the adjustments needed to keep the class on track.

Figure 7

Lesson Review – Example

Figure 7 Lesson Review Example

<p>Throughout the week:</p> <p>Monday 1/9/23: Students, as a whole, had a pretty good understanding that plants needed soil, air, water, and sunlight to grow.</p> <p>I guided them in an understanding up on the board. Started to create the energy path that they would model on Thursday (1/12/23).</p> <p>Sun (radiation/photons) → enters into plants = growth of plants</p> <p>Tuesday 1/10/23: Students made great connections to previous knowledge of chemical reactions. They easily grabbed onto water, carbon dioxide, and photons reacting with byproducts being glucose and oxygen.</p> <p>I guided them through the energy path again, Sun (radiation/photons) → enters into plants = growth of plants</p> <p>This time, I guided them with the added information: Sun (radiation/photons) enters into plants (chloroplasts) = growth of plants and chemically reacts with water and carbon dioxide, byproducts are oxygen gas and glucose.</p> <p>Wednesday 1/11/23 **This was an added day in the schedule due to weather (typically no science on Wednesdays)</p> <p>Students built on previous knowledge of modeling the chemical change from water, carbon dioxide, and photons from the previous day.</p>

Note: Example of observations from a week's lesson sequence. Sample pulled from John Beitler's journal.






After teaching lessons for the week, I gave the students the rubric and assessment task. I then started working on the Likert scale, see Figure 8. I created a Likert scale for each rubric so that I was able to compare my data in a modified quantifiable way. This scale consisted of four

large categories: *Overall, Creation Style, Timeliness, and Content*. These four categories echoed the flaws that Popham (1997) discussed in his paper. I rated each category using a five-point scale, with five being the best. I also created qualifiable categories to align with these scores, five being *Very Satisfied*, four *Satisfied*, three *Neutral*, two *Unsatisfied*, and one being *Very Unsatisfied*. At the start, I also created a definition to ensure all my data adhered to those same standards throughout the project.

Figure 8

Likert Scale Example

Figure 8 Likert Scale Example

Holistic Rubric					
	5	4	3	2	1
Rating:	Very Satisfied	Satisfied	Neutral	Unsatisfied	Very Unsatisfied
Overall			X		
Creation Style	X				
Timeliness	X				
Content				X	
Pros	This rubric was really easy to create in terms of use of time and style.				
Cons	I feel that a con to creating this type of rubric is that was too broad in expectations. The expectation of my content made this a challenge in aspects of focus. I really liked how broad I could keep it but the struggle came in the form of depth and I do not feel that my overall target was hit. I checked the box on this one as the focus of my week did not go as planned. I				
Overall	This was a quick and easy rubric to create. It was a challenge to keep the information focused and not let it get too broad, I felt like it ended up broad and did not help focus my targets as much as I would have liked. This rubric would be beneficial to newly introduced information in general. I do not necessarily dislike this rubric but this content proved to be a challenge in terms of building the expectations of learning.				

This rubric would be great for an introduction type or overall encompassing (exit) type of rubric.

Note: This is a completed example of my Likert Scale from my first holistic rubric from cycle 1. I used this scale to create quantifiable data in a project that focused on qualitative data.

The first *overall* category was related to how the rubric performed overall. This was how I created my scale and its ratability. In Figure 8, notice that there are two overall categories. The first overall category represents the overall rating for that specific rubric. It is a compilation of use and ease. The *creation style* refers to the ease of creation. It was rated very unsatisfied if it was a challenging style to build.

On the other hand, if it were easy to create, I chose 'very satisfied' instead. The *timeliness* category was a rating for the time it took to develop the rubric. Very satisfied was used for rubrics with a minimal amount of time taken. In contrast, being very unsatisfied was used when the rubric took an amount of time that was not beneficial to the overall assignment. The *content* category focused on whether this rubric fit that content meaningfully. If the content was too abstract to fit the criteria or needed to be more flexible to allow students to show their knowledge, very unsatisfied became the label. If the content fit were perfect for that rubric, very satisfied was the label used. Next, I created the *pros* and *cons* categories to provide meaningful feedback, which became a large part of my analysis. Additionally, these categories were a way to measure the benefits and consequences of that rubric. The final *overall* category at the bottom of the chart was for looking at the big picture of the rubric.

Analysis

In my analysis, I compiled all six cycles of data. Of these, I viewed them as two separate parts of this project. The first part consisted of cycles for three types of rubrics I developed. They were Holistic 1, Analytic Descriptor 1, and Single Point 1. Part two consisted of cycles four through six. These included Holistic 2, Analytic Descriptor 2, and Single Point 2. Next, I compared each rubric to its counterpart, e.g., Holistic 1 to Holistic 2. In this comparison, I

looked for the *pros* and *cons* that aligned between the two (see Figure 9). I made this same comparison across three different rounds. Through this action research, I used a modified constant comparative method (Thomas, 2017) to analyze my data.

Figure 9

Holistic 2 – Notes

Figure 9 Holistic 2 - Notes

Date: 1/30/23	Rubric: Holistic	Notes/Observations/Themes
<p>Backwards design: Main focus for the unit: How does the food we eat give us energy? And What processes cause the cycling of Earth’s materials?</p> <p>Day 1: 1/30/23 Assessment Day - Cellular Respiration - this will be a challenge for the students. They are not quite understanding the concept nor are they excited about the content in general.</p> <p>Day 2: 1/31/23</p>		<p>Holistic 2: Pros: Great introduction type rubric, easy to create, takes a limited amount of time, and the structure is easy to build.</p> <p>Cons: Felt very basic giving it late in the learning cycle. The content was a struggle with this attempt.</p>

Note: This figure extracts the first round of data by looking at the overall pros and cons.

For the first round of analysis, I compared the general aspects of the pros and cons, see Figure 5. As an example of the process, in that comparative portion, the pros for the Holistic 1 rubric were easy to use and easy to create. The cons for the Holistic 1 rubric were too broad and lacked depth. Further, the Holistic 2 rubric data provided more detail. This was useful because Holistic 1 did not provide the information or depth I needed to continue the comparison effectively. The data from the Holistic 2 rubric also showed that it worked well as an introduction type of rubric. It was effective in timeliness, and the structure was easy to create. In the third round, I explored the data and identified my themes.

Coding

When I first started looking at my data, I read through it. I wanted to see which themes emerged naturally. As I reviewed my Holistic 1 data, I highlighted my data in different colors—the colors represented other ideas that emerged, see Figure 10. After reviewing my data for the first time, I noticed that the concept taught became important. Next, I noticed I had lots of feeling words in my data. While using a holistic rubric, I noticed I had pre-existing expectations for the rubrics I created, and the outcomes looked different. Another emerging theme was that theoretical frameworks were apparent throughout my teaching. I approached Analytical Descriptor 1 similarly, looking for those same themes and any other ones that may appear. This process continued into Single Point 1, where I changed gears and actively sought to locate those themes in part 2, cycles four through six.

Figure 10

Notes, Observations, and Themes

Figure 10 Notes, Observations, and Themes

Date: 1/8/23	Rubric: Holistic	Notes/Observations/Themes
<p>Planning it all out:</p> <p>(YELLOW) For this week, I am tasked with creating a holistic rubric focused on the subject of photosynthesis. Along with this being a challenging area in terms of rigor and being abstract, (GREEN) I am a little nervous. The lessons are set up to look at how energy flows through the system as a whole. That is where my ideas are going to stem from in terms of expectations. The idea still relates to photosynthesis but hits more on the target of the standard.</p> <p>From STEMscopes (my curriculum): MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.</p> <p>Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.</p> <p>Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.</p> <p>Steps to get there: (LIGHT BLUE) Rubric: Holistic rubrics look at learning as an all encompassing activity. There may be gaps in the learning (underpinnings) but the overall understanding of the concept is reached and assessed through the rubric. ></p>		<p>Coding:</p> <p>(YELLOW) Concepts:</p> <ul style="list-style-type: none"> ● Photosynthesis: challenging area in terms of rigor and being abstract <p>(GREEN) Teacher:</p> <ul style="list-style-type: none"> ● Feelings: <ul style="list-style-type: none"> ○ I am a little nervous. ○ I really liked how broad I could keep it <p>(PINK)</p> <ul style="list-style-type: none"> ● Rubric Expectations/Outcomes: <ul style="list-style-type: none"> ○ This type of rubric is too broad in expectations. ○ The expectation of my content made this a challenge in aspects of focus. ○ struggle came in the form of depth ○ The focus of my week did not go as planned. ○ This rubric would be great for an introduction type or overall encompassing (exit) type of rubric. <p>(LIGHT BLUE) Framework:</p> <ul style="list-style-type: none"> ● Constructivism/Differentiation: Students made great connections to previous knowledge of chemical reactions. <p>Students built on previous knowledge of modeling the chemical change from water, carbon dioxide, and photons from the previous day.</p>

Note: In the Notes, Observations, and Themes column, I placed the ideas that later became my emerging themes.

In the example above, I demonstrated how this modified constant comparative method worked (Thomas, 2017). In studying the observations and writing I produced that accompanied the development and implementation of these rubrics (the self-study portion), I used multiple sets of reviews. Each time, I added new themes and reviewed the rest of the data for these themes as I cycled through my analysis.

Chapter 4

Results and Discussion

The four themes that emerged were: *changes over time*, *theory to practice*, *rubric expectations and outcomes*, and *flaws and rules*. Each theme had multiple parts that I explored deeper in this chapter. Table 1 provides an overview of this chapter's results and order.

Table 1

Key Themes

Table 1 *Key Themes*

Changes over time	Theory to Practice	Rubric Expectations and Outcomes	Flaws and Rules	
			Flaws	Rules
Thoughts Actions/ Instruction	Differentiation Constructivism	Holistic Analytical Single Point	Task-specific evaluative criteria	Make sure the skill to be assessed is significant
			Excessively general evaluative criteria	Make certain all the rubric's evaluative criteria can be addressed instructionally
			Dysfunctional detail	Employ as few evaluative criteria as possible
			Equating the test of the skill with the skill itself	Provide a succinct label for each evaluative criterion
				Match the length of the rubric to your tolerance for detail

Themes

Theme #1 – Changes Over Time. The theme of changes over time emerged in two parts: thoughts and actions/instruction. For instance, in development and implementation of Holistic 1, I used phrases like 'I am a little nervous.' This was concerning the overall concept that I taught. It also was the feeling I had connected with, as well as how to use a Holistic rubric for this content and find success in its use. At other times my nervousness turned into feelings of inadequacy. I demonstrated this when I wrote, "I did not know how high I could set the bar without being too aggressive in their academic stretch." If I had set the bar too high for my students, I felt it ultimately set them up for failure. At another point, my nervousness and anxiety turned into frustration. "I have found this [cellular respiration] to be the most frustrating concept to teach [I have taught] all year." Despite this, even if I felt like I was not a strong teacher with these concepts, the rubrics I used overall changed those feelings. I used these rubrics in ways that left me feeling empowered.

I felt empowered as an educator, as I did not have to be afraid and I was bound to find success with teaching with rubrics. Rubrics gave me an end goal that I knew my students could reach their goals if I took the proper steps along the way. I also felt empowered when my students found ways to explain their thinking, as it was an open-ended assessment. Toward the end of one of the cycles, I wrote, "I really liked how broad I could keep [the holistic rubric]." For the single point rubric, I wrote, "I liked adding the category of "What Else Do I Know." So, even though I started many of my rubric cycles feeling frustrated, nervous, or confused, I typically ended the cycle feeling less nervous, more empowered, and confident. These resulted from using rubrics, backwards designing, and reflecting on my work.

Within my reflection, I noticed a change in my thoughts over the period I had collected the data. When my thoughts changed, so too did my actions and instruction. Using backwards design became a significant part of this research. In the beginning, I used it as a way to set checkpoints. After the first cycle, I noticed that it was a necessary process. I used this process to ensure I was aware of where my students might struggle and found ways to pivot the instruction or came to the realization on when I needed to spend more time on that concept.

In the case of the cellular respiration concept, which is an abstract one for my students, they needed to understand what started the process, the reaction, and the byproducts that were left behind. I found myself pulling back on group work and taking more control with direct instruction to make sure the students had a better background to build their understanding of this abstract concept. I noted in my observations that this worked well, as the class took more time to work through the activities, and the overall assessment score increased dramatically. I cannot say, without a doubt, it was the change in how I presented the concept but how I laid my instruction out in a much more structured manner. If the class was in the middle of a concept and I gave my rubric, the information from that rubric helped establish where I needed to increase the rigor or slow the class down to review. If I asked students to provide models on the rubric, I created models throughout the week as practice. This helped to set the expectations when starting a new cycle, see Figure 4.

Theme #2 – Theory to Practice. This theme was the most surprising theme to emerge from my data. I had known that differentiation and constructivism were important beliefs, I wanted to put into practice, when it came to being an educator. However, when I pulled the information from the data, shown clearly in black and white, I knew I had practiced what I

believed. This theme appeared in comments like, "Students made great connection[s] to previous knowledge of chemical reactions." In the chemical reactions unit, I had gone to great lengths to have my students understand the appropriate level of depth. When the students had the skills and knowledge they could rely on from that foundation and start building upon it, I knew I had done something right. That knowledge I built a few months back and I also noticed that it created day-to-day connections. "Students built on previous knowledge of modeling the chemical change from water, carbon dioxide, and photons from the previous day." Building upon that foundational work in education was very impactful no matter how much time had passed. It was not just the students I noticed who chose to start setting that foundation – I had made choices too. With the Analytic Descriptor 1 rubric, I found evidence of this. "All of this information will play into background knowledge in the next unit, as they are looking at the energy flow out of the plant and into food chains." I made choices in my teaching in which I was preparing my students not just for tomorrow's lesson but also for the upcoming units. Building the foundational knowledge was vital as it allowed the students to make connections later on.

Keeping students at the foundational level did not help them construct further knowledge. In this project, rubrics helped to create new pathways in which the student had a little more control over how they constructed their understanding of different concepts. For example, in the photosynthesis unit, I wrote, "One specific reading had [the students] look at the chemical formula for the photosynthesis process. This was built into my rubric as an advanced category." In each unit, students were able to build upon their knowledge. First, the curriculum program had lessons based on background knowledge, then led them into new learning through a few hands-on activities, and finally, it solidified this information through

reading. Despite how each student learned, the program had built-in multiple ways that encouraged learning. Aside from the different activities, my class worked in pairs, groups, and occasionally alone if the student preferred. I kept them mainly in groups so they could share and build upon their ideas.

Theme #3 – Rubric Expectations and Outcomes. From the beginning, I had expectations for each rubric already established mentally. This is where my biases showed up. I started this adventure by trying to prove that single point rubrics were the new standard. In comparison, I thought holistic rubrics were throw-away rubrics that held little to no purpose. I felt that analytic rubrics were too wordy and typically used for writing.

By using my Holistic 1 rubric, I had a very negative attitude, and my overall expectations were low. I wrote that it was too broad. "The struggle came in the form of depth." I found using a holistic rubric challenging if I wanted to find evidence that had my students provide their own evidence their understanding. Holistic rubrics required minimal, too broad, information from the class. "This rubric would be great for an introduction type or overall encompassing (exit) type of rubric." I thought this rubric had little benefit in creating an opportunity for the students to explore and show what they knew. I needed to use it as an introduction measurement tool.

By Holistic 2, my ideas had not changed, but my attitude had "With this holistic rubric creation, the second round, I was able to create an all-encompassing basic understanding rubric." The holistic rubric had benefits already integrated within the introductory process checks. This rubric worked well as a beginning check for understanding. "It is easy to create, takes a limited amount of time, and the structure is easy to build." Because making this rubric was quick and easy and had a familiar structure, it did not take long to create a successful

holistic rubric. I wrote this about this particular holistic rubric. "It was a struggle to use as a major end-of-the-unit cycle assessment, and had this been different content, I do not see the value in the data it would have provided." I will continue to use holistic rubrics just as long as the students are in the infancy of their learning.

I gave analytic rubrics the same positive approach as holistic rubrics, familiar with the structure, but the potential for teachers to use it as a torture device existed naturally. By that, I mean "the rubric allows for pitfalls to be set up by the teacher." This became a challenge for me as an educator. I didn't particularly appreciate how I could purposefully set my students up for failure. If I wanted to set up a question requiring a student to have a deep understanding that seemingly was unachievable, I could do that and call that section advanced. Even with being a teacher that presumed positive intentions with my students, I still could be pigeonholed into creating a rubric that created pitfalls within my classroom due to the structuring of this rubric. "Teachers must create levels. I started with Proficiency being a "3", and then moved to Advanced, "4", then to Basic "2", and with the Below Basic "1" category. This created issues, as the situation forced me to find ways to set the levels apart, typically in ways that I found unhelpful.

To set the levels apart, I nitpicked little details to separate the levels of learning and the evidence the students provided. In some ways, these pitfalls were quantitative, e.g., the student modeled three steps in the process, or they modeled two steps in the process. I understood how that separation set clear boundaries for levels. However, this created more significant issues regarding quality for the students and me. For example, in the first analytic rubric I built for my energy path category, a level three was represented with this expectation:

"The student can build and explain the energy path as has been discussed in class." Level two was represented by "The student can build or explain the energy path as has been discussed in class." The only difference separating proficient and non-proficient students was the word "and." I established this criterion to decide whether a student passed or failed based on one word. Ultimately, it was the student's job to know the material, but I struggled with setting those barriers in the classroom. These barriers were only sometimes a con, though.

By the second time I approached this rubric, I found "I liked how the content and the rubric worked well together. The categories were a great fit, and overall, it did not feel too busy or confusing." These rubrics work well with a wide range of content. Another thing I noticed while building Analytic Descriptor 2: "I liked how straightforward it was in that area; I did not care for the extension I had to do to create points for advanced or the no-effort categories, but they were a must overall for this type of rubric." It worked well as an introduction and accessing depth of knowledge type of rubric." It is here where an "Ah-Ha! Moment" appeared.

The rubrics I worked with started to show an unexpected pattern. They worked in a way that built upon each other. In other words, holistic rubrics were great gateway or introductory-type rubrics. Analytic rubrics worked well as introductory rubrics. They also worked to set up specifics within its natural structuring. So, even though analytic rubrics put me into a difficult builder role, they had some benefits built within them. I was excited to discover how I used a holistic rubric to construct an analytic one.

While using single point rubrics, my initial expectations were that this rubric would be the easiest to work with. This rubric would save me time, effort, and, hopefully, some educational sanity. In my mind, these single point rubrics would become my magnum opus. On

my first attempt at making a single point rubric, I discovered, "The single point rubric clarifies the expectations of the task or assignment given." Success is easier to obtain when the expectations are clear and the presented communication is clear.

Another benefit of the single point rubric was "It also leaves room for interpretation in terms of depth and showing what a student knows. This rubric has natural boundaries in which students find where they are successful." This rubric allowed students to show what they knew and explain it in their terms, the way they wanted. "I created six different categories that allowed for greater detail[ed] exploration of comprehension and connections beyond the content. This rubric was open-ended and I did not set too strong of parameters where the students could move beyond my expectations to show new knowledge." It was freeing knowing that my students could finally show how their thinking worked and what connections they were making in their lives to make their learning relevant to themselves. I finally got a snapshot of what was going on inside their heads. At the middle school level, this was an important part of learning to tap into. "I was able to build off of the previously built analytical descriptive rubric and fine-tune it." This idea showed up again in my single point. I improved and used the important parts of the previously built analytic rubric. "I liked adding the category of "What Else Do I Know". This section allowed the students to move beyond the expectations of the content and explain new learnings that I did not ask about."

Even with this surging positivity behind the creation of the rubric, I still found issues. "To create a focused and yet open-ended rubric, the creation process took more time than previous work even though the main goals had been taken from a previously built rubric." Time is essential to a teacher. However, my biases were still very apparent. "I also liked how this rubric

would allow me to create scaffolds to find spots where the students might struggle; this came in the form of vocabulary and other basic content explanations. This was probably the best tool for student knowledge exploration that I have worked with out of the three." The pitfalls from the analytic descriptor were a huge issue that I refused to overlook within its constructs. This same issue for single point rubrics turned out to be a problem I sought to solve and turn it into a benefit.

For the second attempt at a single point rubric build, I found, "I really liked the structuring of this rubric." Like its analytic descriptor counterpart, the structuring, though unique, worked well in this manner; again, the bias appears. Single 2 was easy to create, saved time, and helped students understand the expectations required from their perspective and mine. The second time around began with far fewer struggles. "The categories and content fit well within this structure. I did not have to stretch the categories or content to make this rubric fit the overall objective." I did not have to create pitfalls for my students. They either achieved the expectations or they did not. Trapping students into one mode of explaining or representing their work did not occur. From my perspective, "It allowed for feedback to be given to the students." This was a valuable addition to this rubric.

Theme #4 – Flaws and Rules. I initially looked at Popham's (1997) flaws for this theme. In Table 2, I had tried to keep myself cognizant of these flaws. As a first-time focused rubric builder, my attempts still fell short. This included all six cycles. So, I may have passed one section for one rubric but found flaws in its counterpart. If both rubrics had not passed the requirements provided by Popham's definitions, it received a "flawed" score. On the other hand, if both rubrics passed Popham's definitions based on my understanding, I gave it received

a passing score. Based on this information, Popham would favor the holistic rubric above the others regarding the pass/flawed scenario. To this day, I still a lot of work to do to avoid these flaws that Popham warned of their readers. It was challenging to look back at the time and effort I put into these and realize how much work was put into them to create effective rubrics. Even though I had focused on avoiding these flaws, my perspective changed when building rubrics with the intention of wrapping up their learning after only having completed three lesson every week. Perhaps, it was this short amount of time that had created these flaws to be so prevalent within the work.

After I had concluded my work, I found Popham's (2017) work. I wanted to know if Popham's ideas had changed over those 20 years. Their warnings turned into helpful guides to rubric builders. Not only did I see a change in Popham's work, but it seemed like they were working on creating ideas and pathways for educators to take when taking on this task. For example, Popham created five rules for skill-specific rubrics.

Table 2

Flaws and Rules

Table 2 Flaws and Rules

Flaws and Rules – Pass or Flawed	Holistic	Analytic Descriptor	Single Point
Task-specific evaluative criteria	• Flawed	• Pass	• Flawed
Excessively general evaluative criteria	• Flawed	• Flawed	• Flawed
Dysfunctional detail	• Pass	• Flawed	• Pass
Equating the test of the skill with the skill itself	• Pass	• Flawed	• Flawed
Make sure the skill to be assessed is significant	• Pass	• Pass	• Pass
Make certain all the rubric’s evaluative criteria can be addressed instructionally	• Pass	• Pass	• Pass
Employ as few evaluative criteria as possible	• Pass	• Pass	• Flawed
Provide a succinct label for each evaluative criterion	• Flawed	• Flawed	• Flawed
Match the length of the rubric to your tolerance for detail	• Pass	• Flawed	• Pass

“Rule 1: Make sure the skill to be assessed is significant.” (Popham, 2017, p. 210). They advise that the skill being measured is worth the time and effort the builder puts into building the rubric for that skill. "It makes more sense to measure a modest number of truly important skills properly than to do a shoddy job in measuring a shopping-cart full of skill." All of the

rubrics passed this rule. The time and effort I put into them, as a whole, was worth it. When I had started out and was learning something new, it took more time. By the second cycle, the time it took to develop the rubrics decreased and a rhythm started to play out when I worked on them.

“Rule 2: Make certain all the rubric’s evaluative criteria can be addressed instructionally” (2017). Again, all three types of rubrics passed. Popham states, "You must scrutinize every potential evaluative criterion in a rubric to make sure you can actually teach students to master it" (2017). After reviewing standard expectations in the curricular program and using the backwards design process, I found success here. After this point, only some of the rubrics passed.

“Rule 3: Employ as few evaluative criteria as possible” (2017). Popham explains that to be effective in the criteria practice, the rubric builder should keep the evaluative criteria to three or four categories. My holistic and analytical rubrics ranged in categories from one to three. The first single point had six categories and the second one had four. I had improved in the number of expectations.

“Rule 4: Provide a succinct label for each evaluative criterion” (2017). When I had to give this a flawed score, I was disheartened. The reason behind the rating was because Popham stated, "These one-word, easy-to-remember labels will help you *and your students* of what's truly important in judging mastery of the skill being assessed" (2017). Unfortunately, all of my labels contained two or more words, thus resulting in a flawed score.

“Rule 5: Match the length of the rubric to your own tolerance for detail” (2017). This is where Popham allowed educators to explore rubrics to find what works for them. Popham

explained how some teachers prefer longer, more detailed rubrics because it provides more details and communicates clearer expectations to the students. Other teachers prefer less wordy rubrics as it keeps the length down as is more approachable for students. Popham's recommendation is to keep rubrics under two pages in length. Holistic and single point rubrics passed this rule; analytic rubrics did not. This rule was a challenge. Yes, I kept the rubrics under two pages. However, the wordiness and length of the analytic descriptor led it to receiving a flawed score.

Limitations

There were four questions I explored the limitations of this action research self-study project. First, using action research allows researchers to study their practice at a specific time and place. It allowed me, as a researcher, to dig deep into the problems of practice and learn from them. Choosing each rubric had benefits and consequences that impacted my teaching, the content, and my students' abilities to show what they knew.

Action research and self-study would not show the same outcomes if another teacher used this process with a larger number of participants, in different locations, or under a different content. With that, I cannot generalize this study. This allows the reader to make their own generalizations.

I learned that this project was short in duration, but it still was a powerful project in creating new connections and bringing to light my choices as a teacher. I was able to change various practices within my classroom. In the end, this project helped me to understand that rubrics can build on one another, and it is like having a range of skill-measuring tools ready to be used in my classroom. I better understood backwards design and how to integrate

constructivism and differentiation into my classroom practices more meaningfully. This project taught me much about who I am as a teacher and how I can help my students. By helping my students, I now have new approaches I can use in other content areas. Integrated into this project were my biases without checks and balances, aside from trying to be honest with the ones that I am aware of. Also, I conducted this project with a multi-grade level setup with the students all learning the same material in the same way. Another teacher would not replicate the results in another setting, nor would I expect if this same project were conducted next school year in the exact location. My results were based on my site, with this specific group of students, involving this material.

I recommend that another person research the same two-part cycle and see what results they gain from it. Given the rurality of this project, I recommend that someone explore this process with a larger population. Perhaps they have more students or more teachers in their study. Another recommendation I want to put forth is to study which rubric is the best quantitatively. Do the numbers support that one rubric is better than another?

Conclusion

At the beginning of this project, I set out to answer, "What does the process of exploring the use of several types of rubrics in my instruction look like?" Well, in short, it is messy. This is because the project, in general, was integrated, as are most practices within education. The process explored three types of rubrics: holistic, analytic, and single point. After looking at the standards I needed to teach, I backwards designed my lessons. I then looked at that rubric type that I was set to use for that week. After building the rubric, I journaled about what I had done and what had happened inside the classroom environment. By the end of the week, the

students took their assessment; I reviewed their work and made changes for the next week. Then, the process started all over again with a different rubric. This process happened throughout two cycles, three rubrics per cycle.

After doing this project, I found some interesting ideas emerge. First, I discovered that I put theory into practice more than I had thought. Constructivism and differentiation are critical to me as an educator and this project showed that. I also found it surprising that my biases were misaligned. I never considered those boundaries when I only thought positively about a particular rubric. Instead, I viewed these boundaries as problems that needed solving. On the other hand, when I only looked at the rubric with contempt, those same biases were boundaries that created deficiencies that I did not care to overcome. Instead, I used them to explain why they were useless in my classroom. Finally, I had some great reveals about rubrics in general and how I can now implement any type in my classroom. Even though they all have built-in problems, they have benefits that empower teachers to help themselves and their students.

To my readers, I hope you find encouragement in using rubrics and start to see the many benefits they can bring to your life, not just in education. I hope you find answers to the problems I have discovered in this process and that your overall process surpasses my efforts. Finally, as a reader, I hope you take action, for it is within action that you discover accomplishment.

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Appendix A

Holistic 1

Holistic 1	4 - Advanced	3 - Proficient	2 -Basic	1 - Below Basic	0 - No effort
Energy Path	Can effectively name all of the steps in the energy path and in the correct order.	Can effectively name 2-3 of the 4 steps in the energy path in the correct order.	Can effectively name 2-3 steps in the energy path but may not be in the correct order.	Can effectively name 1 step in the energy path.	No effort.

Analytic Descriptor 1

Analytic Descriptor 1	4 - Advanced	3 - Proficient	2 - Basic	1 - Below Basic	0 - No effort
Energy Path	The student can build and explain the energy path as has been discussed in class and expand on the next steps.	The student can build and explain the energy path as has been discussed in class.	The student can build or explain the energy path as has been discussed in class.	The student can build the energy path as has been discussed in class.	No work/effort shown
Chemical Reaction	The student can name the type of energy in the process and explain the chemical reaction in the photosynthesis process. They also can write the chemical equation out and explain what that equation means.	The student can name what reacts in the chemical reaction in the process and explain the chemical reaction that occurs in the photosynthesis process.	The student can name what reacts in the chemical reaction in the process or explain the chemical reaction that occurs in the photosynthesis process.	N/A	No work/effort shown
Reactants/ Products	N/A	The student can name the reactants and byproducts of the process, as discussed in class.	The student can name 2-3 of the reactants and byproducts of the process, as discussed in class.	The student can name 0-1 of the reactants and byproducts of the process, as discussed in class.	No work/effort shown

Single Point 1

<u>Photosynthesis/Cellular Respiration Single Point Rubric</u>		
Below Expectations Feedback	Content Expectations	Exceeds Expectations Feedback
	<p><u>Model –</u></p> <ul style="list-style-type: none"> • Draw and label the energy cycle between plants and organisms <ul style="list-style-type: none"> ○ Include the location where the energy is formed for plants and organisms and the reactants/byproducts. 	
	<p><u>Cellular Respiration –</u></p> <ul style="list-style-type: none"> • Name the reactants and products discussed in class for cellular respiration. 	
	<p><u>Photosynthesis –</u></p> <ul style="list-style-type: none"> • Name the reactants and products discussed in class for photosynthesis. 	
	<p><u>Explanation –</u></p> <ul style="list-style-type: none"> • How is this system a cycle? • Why is the sun so important to this cycle? • Can plants or organisms exist without each other? Explain using scientific reasoning. 	
	<p><u>Vocabulary –</u></p> <ul style="list-style-type: none"> • Use the scientific vocabulary we have discussed and used in class. 	
	<p><u>What Else Do I Know –</u></p> <ul style="list-style-type: none"> • What else would you like to share about this topic that you know but may not have been asked? 	

Holistic 2

Holistic 2	4 - Advanced	3 - Proficient	2 -Basic	1 - Below Basic	0 - No effort
Cellular Respiration	N/A	Can effectively model and explain all of the steps in the cellular respiration process in the correct order.	Can effectively name and explain 2 steps in the energy path but may not be in the correct order.	Can effectively name 1 step in the energy path.	No effort.

Analytic Descriptor 2

Analytic 2 - Rock Cycle	4 - Advanced	3 - Proficient	2- Basic	1 - Below Basic	0 - No Effort
Rock Cycle Model	The model is detailed and explains, using words AND arrows, etc., how the rock moves through the cycle. The student also connects all four (4) rock types to all of the other types.	The model is detailed and explains, using words AND arrows, etc., how the rock moves through the cycle.	The model is detailed and explains, using words, how the rock moves through the cycle.	The model is detailed and explains, using arrows, how the rock moves through the cycle.	No effort/ model created does not show an understanding of the rock cycle.
Stages/Process	Explains in great detail what the four (4) types of rock/stages are and how they are formed.	Explains in detail what the three (3) types of rock/stages are and how they are formed.	Explains in detail what two (2) types or fewer of rock/stages are and how they are formed.	Provides minimal information in the explanation of what three (3) or fewer of the rock stages are.	No effort/ Details are wrong within the explanation.
Energy	Explains where the energy source for four (4) of the rock stages comes from.	Explains where the energy source for three (3) of the rock stages comes from.	Explains where the energy source for two (2) of the rock stages comes from.	Explains where the energy source for one (1) of the rock stages comes from.	No effort/ does not explain where the energy comes from; the details are wrong.

Single Point 2

<u>Rock Cycle Single Point Rubric</u>		
Below Expectations Feedback	Content Expectations	Exceeds Expectations Feedback
	<p><u>Rock Cycle Model –</u></p> <ul style="list-style-type: none"> • Draw and label the rock cycle <ul style="list-style-type: none"> ○ Include the location of where: <ul style="list-style-type: none"> ▪ the 4 (four) rock types are formed and how ▪ the energy comes from each of the 4 (four) types of rock stages discussed in class. 	
	<p><u>Explanation –</u></p> <ul style="list-style-type: none"> • How is this system a cycle? • Explain what the two energy sources that impact the rock cycle are and which stages they impact. 	
	<p><u>Vocabulary –</u></p> <ul style="list-style-type: none"> • Use the scientific vocabulary we have discussed and used in class. 	
	<p><u>What Else Do I Know –</u></p> <ul style="list-style-type: none"> • What else would you like to share about this topic that you know but may not have been asked? 	