

A Journey Toward Course Assessment as a Relational Practice in Mathematics Methods

Alyson E. Lischka, Natasha Gerstenschlager, & Jennifer Seat

Assessment

Mathematics Methods

Relational Teacher Education

A future teacher sat across from Alyson and tearfully pleaded, “How do I get those points back on this lesson plan so that I can have an A?”

Rather than a response, unspoken questions came to Alyson’s mind: Why are the points the issue? Shouldn’t this be a conversation about improving practice? What message am I sending in my class structure that makes the points the most important thing?

Developing a relational teacher education [RTE] practice (Kitchen, 2005), which supports prospective teachers [PTs] in developing their teaching practices, is sometimes burdened with barriers. Examination of specific threads which weave together RTE practice provides ways to improve practice, remove barriers, and develop meaningful relationships to support PTs in developing their personal practices. This self-study arose as part of Alyson’s journey toward developing a RTE practice, with specific attention to the thread of student assessment within a mathematics methods course.

During previous investigations of feedback practices (Kastberg et al., 2018), Alyson encountered a living contradiction (Whitehead, 1989) between perceived expectations and cultural norms for feedback in her mathematics department and her own vision for RTE practice in her mathematics methods course. As a teacher educator espousing constructivist theories of teaching and learning (Kastberg, 2014; Steffe & D’Ambrosio, 1995) and striving to build a RTE practice (Kitchen, 2005), the traditional assignment of numerical and letter grades within her course did not serve the “constructive alignment” (Biggs, 1996, p. 347) she sought. Instead, the traditional point system of grading often produced frustrating conversations such as that in the opening vignette rather than discussions that focused on growth and improvement. In this paper, we first describe the tapestry of theoretical contexts in which the work is situated and then describe the local context, data collection, and analysis methods used to support the study.

Findings support the argument that shifting assessment away from traditional numerical grading removed one perceived barrier and made space for practices that support RTE but also revealed previously unrecognized tensions in RTE practice.

Theoretical Perspective

This study took place at a southeastern U.S. public university in a secondary mathematics methods course in which constructivist teaching (Kastberg, 2014; Steffe & D’Ambrosio, 1995) and RTE (Kitchen, 2005) served as underlying theoretical perspectives for the structure of the course activities. Kastberg (2014) characterized constructivist teaching as the “study [of] mathematics teaching and learning constructions of teacher-learners in a learning space whose

design is based, in part on a working knowledge of teacher-learners' concepts of mathematics teaching and learning" (p. 352). It revolves around the instructor valuing PTs' autonomy and viewing PTs' existing models of teaching as rational. Instructional activities that align with constructivist teaching include situations "designed for teacher-learners that support awareness of self as a model builder" (Kastberg, 2014, p. 353) and provide opportunity for reflection and interactive communication in order to corroborate ideas about teaching and learning.

With constructivist teaching as a perspective, knowing PTs becomes an essential action for instructors so that situations designed as class activities can allow space for PTs' model building. Kitchen's (2005) RTE, described as "a reciprocal approach to enabling teacher growth that builds from the realization that we know in relationship to others" (p. 17), provides a framework for understanding what it means to *know* PTs. Drawing from Rogers' (1961) *helping* relationships, RTE respects the experiences that PTs bring to teacher education classrooms and builds knowledge from those experiences in authentic ways. Kitchen described seven characteristics central to RTE: understanding one's own personal practical knowledge, improving one's practice in teacher education, understanding the landscape of teacher education, respecting and empathizing with preservice teachers, conveying respect and empathy, helping preservice teachers face problems, and receptivity to growing in relationship (2005, p. 18). In concert with constructivist teaching practices, a methods course guided by RTE is focused on building knowledge of teaching collaboratively with PTs through their own experiences.

Assessment of learning is a required aspect of any course, including those situated in constructivist teaching and RTE. Traditional forms of assessment which utilize summative assessments and letter/percentage grades prevail in higher education (Buhagiar, 2007; Rojstaczer & Healy, 2012) and have historically served the purpose of "selection and certification" (Buhagiar, 2007, p. 39). In addition, classroom assessment can be used to screen students, diagnose strengths and weaknesses, and provide opportunities for creating records of learning or feedback on progress. However, traditional assessment is most often used as a tool for motivation or control within a system structured around rewards and punishments (Buhagiar, 2007; Kohn, 1999). This conventional system of assessment is contradictory to the ideals of autonomy and model building set forth in constructivist teaching (Buhagiar, 2007). This study aimed to attend to this disconnect through self-study examination of assessment practices situated within existing research.

Most research on assessment is focused on the effectiveness of standardized and large-scale assessment rather than characteristics of classroom assessment. However, grading practices in teacher education have been the focus of self-studies, though not particular to RTE. McClam and Sevier (2010) reported on the turmoil that arose when they attempted to implement an alternative grading practice in an elementary methods course, revealing the cultural role that assessment plays in education institutions and in society. Brubaker (2010, 2012, 2015) reflected on a move to individual grading contracts as a way to negotiate and enact authority differently in his teacher education course, which provided greater alignment with his theoretical perspective and the goals of the course. Findings from these authors point to the need for a greater understanding of the thread of assessment within RTE and the tensions that arise when aligning assessment and practice.

Aim

In response to the living contradiction Alyson experienced in assessing PTs in her mathematics methods course, Alyson revised her grading policy in the course to remove all numerical values for activities completed. Instead of assigning traditional percentage or number grades on assignments, PTs received written feedback on their work and were informed of whether they had met expectations on indicators for each task through written and verbal feedback. PTs were encouraged to revise all work. A final course letter grade was assigned by Alyson according to whether PTs had met expectations on all, most, some, or no indicators on assignments through original submission or revision of their work.

Aiming to better understand the role that assessment plays in RTE, this study built on prior research to investigate the elements of RTE that are strengthened when a numerical grading system is removed from course tasks and the focus

of assessment is turned toward feedback to inform learning and growth (Hattie & Timperley, 2007) within a mathematics methods course guided by constructivist teaching. The study was guided by the question: How does implementing a non-numerical assessment system in a mathematics methods course allow the instructor to cultivate RTE practice?

Method

This study was conducted in a secondary mathematics methods course taught by Alyson and housed in a mathematics department in a mid-size university in the southeastern United States. The mathematics department is comprised of units that focus on the teaching of theoretical mathematics, applied mathematics, statistics, actuarial sciences, and mathematics education. The grading system at the university requires instructors to assign grades of A, B, C, D, or F, with plus/minus grading allowed since 2000 and implemented in the mathematics department after 2013. Debate in mathematics department meetings concerning the allowance of C- to count toward graduation credit for majors demonstrated this faculty's general adherence to and belief in a traditional grading system structured around summative assessments and percentage scores. Alyson had taught this methods course for five years, and data was collected during her sixth year of teaching, as she successfully progressed through the tenure and promotion process.

Alyson has engaged in self-study of RTE practices over the previous six years. In this study, she introduced Natasha and Jennifer to self-study methodology by engaging them as critical friends (Schuck & Russell, 2005). Natasha, an assistant professor at another institution, has collaborated with Alyson in writing research and practitioner articles, in theoretical discussions of teaching, and in grant opportunities for six years. Jennifer is currently a graduate student in Alyson's program, interested in exploring ways to improve the preparation of teachers. Together, we subscribe to self-study methodology as interactive and improvement aimed (LaBoskey, 2007) and characterized by openness, collaboration, and reframing (Samaras & Freese, 2009). The openness allowed Alyson to make her practice visible to Natasha and Jennifer, enabling reflection about practice that revealed aspects of RTE that emerged in a new assessment context and providing insights into areas for additional improvement. Alyson asked Natasha and Jennifer to engage in constructive listening (Weissglass, 1990) in order to aid in reflection and reframing but also to look for themes and challenge her reflections as the group read and discussed the data.

To gain understanding of the impacts of new grading practices, we gathered and analyzed a variety of data throughout the study. The primary sources of data were an instructor's journal, which was written after most class sessions, and transcripts of conversations between the authors as they reflected on the instructor's journal, which happened bi-weekly. Alyson journaled regularly throughout the course with particular attention to pivotal class sessions and episodes of providing feedback to PTs. Natasha read and commented on the journal prior to the bi-weekly meetings, preparing questions for discussion. Jennifer observed many class sessions in person and used her observations to support researcher discussions. All three authors then participated in recorded bi-weekly constructive conversations about the events of the course as noted in the journal and recollected by the authors, which included Alyson's reactions to and thoughts about assessing major tasks of the course. During these conversations, all three authors reflected ideas from the data back to each other and made sense of instances from the classroom as relevant to themselves and the work of RTE. Additionally, student assignments (including written reflections and reactions to feedback), class session recordings, and interviews with the PTs (conducted by Jennifer following the conclusion of the course) were collected as secondary sources and used to corroborate Alyson's perception of events. After the course concluded, the data were coded according to Kitchen's (2005) characteristics of RTE with additional codes that identified excerpts as particular to the instructor's and PTs' reactions to assessment practices in the course. Alyson first coded all of the data, and Natasha and Jennifer verified the coding, with disputes on codes resolved during analysis discussions.

Next, we tell the story of the threads of assessment in Alyson's methods class in narrative form through vignettes and recollections of events that occurred during class and analytical discussions among the authors. We present the findings in this way in order to demonstrate the emergence of RTE practices alongside previously unacknowledged tensions. By weaving the story across classroom discussions, journal entries, and research team conversations, we build trustworthiness in the findings (Mishler, 1990).

Findings

Alyson's concerns about assessment in her methods course arose during her work to develop RTE practice and through frequent encounters such as the opening vignette. Alyson revised her assessment system in response to her concerns. As she worked to become comfortable with her new non-numerical grading system, Natasha urged her to consider how the grading system might impact the receptivity to growing in relationships with PTs. Alyson realized,

I think I have been so fixated on the grading policy this week that I have not tuned into the building of relationships as I wanted to. . . This week I have let the grading policy sit in the middle and be the thing that I thought was the big issue instead of focusing on letting me just get to know these students. So I really feel like next week what I need to do is just put it aside and forget about it and know that as long as I am recording and gathering all of their journals . . . if they have an issue they will let me know. But I have to work on building that relationship. (Meeting 08/31)

Alyson was concerned about PTs' reactions to a different grading system and almost let it become central in the course rather than building relationships to help them grow in their teaching practice. However, review of class conversations and PT journals indicated the PTs did not appear to be concerned about the change in grading system.

Alyson began to gain confidence in the PTs' lack of concern about assessment when, early in the semester, PTs asked questions about feedback. After a question in class from a PT concerning feedback on their written reading reflections, Alyson wrote,

I liked that the discussion was about 'am I on track in how I am responding' rather than 'is my answer correct.' The discussion was not asked for in the 'what is my grade' way. Instead, the question was about whether or not students are on track in how they are interacting with the readings. (Journal 09/06)

Then, a few days later the class was discussing a letter-writing activity. The activity involved PTs learning to give feedback to high school mathematics-learners through a pen-pal correspondence. One of the PTs asked "Are you going to give us feedback on our feedback? I want to know how I am doing" (Class 09/18). In the research team discussion of these events, Natasha noted the emphasis on development of practice rather than numbers that defined a grade: PTs were asking questions about how they could improve and sought feedback from Alyson that would help them accomplish this improvement.

Growing confidence in the new assessment system allowed Alyson to reflect on how she was providing feedback differently in this environment. From her own recollections on grading and in-class feedback, Alyson noted that she was able to focus her feedback more closely on PTs' professed goals and weaknesses along with her own observations of their work to support them in improving, genuinely conveying respect and empathy for PTs and their ideas. For example, one PT, Clark, shared a goal of grounding his teaching of new concepts in real-world connections. Clark later produced a lesson plan that did not align with his belief. Rather than feeling constrained by a point system, Alyson had conversations with Clark focused on aligning the lesson plan with his espoused beliefs (Journal 10/22) and resulted in an improved plan that built on his personal goals.

With another PT, Kelly, Alyson was able to focus her feedback on the assets Kelly brought to her practice in order to bolster Kelly's confidence. In a journal entry, Kelly, a PT who lacked confidence, had beautifully written about building relationships so that students "trust me enough to be vulnerable with their learning progress" (Student Journal 10/10). Alyson provided feedback that drew on Kelly's clear articulation and encouraged Kelly to continue connecting with learners, again conveying respect and empathy for the PT. After receiving the feedback, Kelly confidently contributed meaningful arguments in an equity discussion during the following class that clearly drew on the feedback Alyson had provided and challenged the class to consider the landscape of teacher education.

Throughout the course, Alyson found evidence of asset-based discussions that built on PTs' experiences and goals and focused on helping PTs to build their own practices. Even though Alyson was encouraged by texts from colleagues that said "The students are sitting here in the office talking about what great feedback they get from you, and how much they

appreciate it" (Text 12/03) she still questioned her practice. Along with the emergence of clear aspects of RTE came the recognition of other tensions.

As she reflected on this text with Natasha and Jennifer, Alyson wondered "but will [my feedback to the PT] have any impact on their teaching?" (Meeting 12/03). This refrain was continued from early in the semester when Alyson wrote:

There was some discussion but the PTs are still looking to me to verify their responses. I want them to start making some decisions about value themselves—maybe I am not providing feedback in a way that helps them to do this. I still felt like the conversations were unidirectional (teacher to student) rather than getting the PTs engaging with each other. (Journal 09/25)

Alyson was confident that the feedback she provided was focused on building on PTs' strengths and helping them to use those strengths to continue to build their ideas about teaching practice and address problems of practice. However, she was not sure about how PTs were taking up the feedback. In a conversation, she shared about her feedback on lesson plans:

I felt like they can take this now and can use this feedback to improve what they have here. Now they all have the option of making revisions and resubmitting it by next Monday. I have not seen my students yet ... so I don't know how they've taken it up. (Meeting 12/03)

Alyson had growing discontent with the new assessment system and wondered if simply removing numerical grades was enough.

In addition to Alyson's discontent with the ways in which her assessment system promoted PTs' self-reflection, she came to realize that the shifted focus highlighted difficulties in building relationships with some students. As Alyson attempted to provide feedback with one particular student, Kevin, she struggled to do so in a way that built on Kevin's experiences.

I have come to realize, though, that part of the trial is that he sees mathematics in such a different way than I do. Kevin is approaching everything from an algebraic perspective and expecting his students to just know to perform some of the algebraic manipulations. He does not connect to visual elements in his lessons—particularly in lessons for which the visual explanations are where he would be able to provide access to struggling learners. I tried to comment on this and I sent him an article . . . He does not move in that direction, however, and leaves me feeling flat after reading his plans. (Journal 11/05)

In several research team discussions, Alyson shared her frustrations about Kevin and her concerns that her "own perception of him is kind of crowding out the ability to really see what he is doing" (Meeting 11/30). Alyson was concerned that her assessment system would be influenced by her lack of effective relationship building with Kevin.

Amidst difficulties with Kevin, Alyson also struggled to consider how she could articulate her grading practices to colleagues. Early in the study, Natasha challenged Alyson to consider "how you might respond to people who say you still have to record a grade" (Meeting 08/31). As a junior faculty member, Alyson's concerns were situated in her own experiences at her institution. Alyson had a prior experience with grading in which her class's remarkably high average on a common final exam was questioned by colleagues. Alyson later recalled she "felt like I had to have that evidence because they were coming to me and saying well 'Why are your grades so high?'" (Meeting 12/14). In justifying her final assigned grades for this methods course, Alyson relied on rubrics for each course assignment and a general course rubric that focused on improvement of practice as evidenced in submitted work. In searching for ways to discuss her grading system, she found herself comparing the non-numerical grading system with a traditional grading system:

The other question I had with grading is: okay even when you have numbers you look at the numbers and you look at the name and you say is this the grade that this student has earned? And I don't think that that process is any different for me right now. (Meeting 12/14)

Although Alyson had growing confidence in the changes in her assessment system, she continued to struggle to support her practice in ways that inspired trust in her practice.

Discussion and Implications

This self-study takes up Brubaker's (2010) call for teacher educators to "document their efforts to question the taken for granted in their grading practices and develop at both the personal and professional levels the knowledge essential for reconstructing conventional practices" (p. 266). Through examination of data collected during a course in which a non-numerical grading system was enacted, the authors engaged in exploration of the impact a shift away from traditional assessment can have on RTE. The data revealed that Alyson focused on the relational practices of respecting and empathizing with preservice teachers, conveying respect and empathy, and helping preservice teachers face problems (Kitchen, 2005) through asset-based conversations in which PTs' strengths and experiences served as a starting point for growth. Alyson's conversations with PTs about their progress were noted to lack reference to overall grades and instead focused on ways to improve practice, all evidence of enactment of RTE. Even in Alyson's struggles to build a relationship with Kevin, the discussion focused not on the grade Kevin was earning but instead on Kevin's experiences and how Alyson was, or was not, finding ways to connect with those. This result demonstrates that Alyson was creating "constructive alignment" (Biggs, 1996, p. 347) between her assessment practices and her theoretical foundation of constructivist teaching. Alyson's assessment practices were now focused on supporting the PTs' constructions of models of teaching.

In turning back to the self and improvement of practice, reflections on conversations demonstrated Alyson's growing confidence in a non-traditional assessment system but revealed a need for further change. Alyson's doubts concerning what PTs take up from the feedback they received calls to question the impact of simply changing the way in which a final grade is determined. Although this one step resulted in positive shifts in Alyson's classroom, her discontent indicates that the change was not sufficient to transform conventional assessment practice to be fully aligned with constructivist teaching. Alyson still felt that students were not taking authority for their own learning and reflecting on their own growth in productive ways. In order to be more fully aligned, changes should be made so that PTs become owners of their own assessment and develop the authority to reflect on their own work and assess progress in rigorous ways.

Traditional assessment practices have changed little in the last century (Rojstaczer & Healy, 2012) and are not sufficient to support constructivist teaching. Buhagiar (2007) urged:

If we truly believe in inclusion and diversity—which builds on the understanding that everyone is capable of learning and worthy of the best possible investment in his or her education—it becomes unsustainable to continue using an assessment model that has traditionally developed to focus on selection, certification and accountability. (p. 41)

The changes Alyson enacted in her methods class take one step in the direction of supporting PTs to develop their practice, but do not sufficiently reach the call set forth by Buhagiar (2007) and Brubaker (2010) to reconstruct assessment practices in ways that support PTs in constructing teaching practice so that PTs will carry with these practices into their teaching careers. In order to reach this goal, teacher educators must continue to publicly examine and question the threads of practice, such as assessment, that form the tapestry of the work we conduct in preparing teachers. Further, teacher educators must support each other in making brave changes that resist traditional practices but encourage prospective teachers to develop skills needed for success in the profession.

References

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education*, 32(3), 347-364.

- Brubaker, N. D. (2010). Negotiating authority by designing individual grading contracts. *Studying Teacher Education: A Journal of Self-Study of Teacher Education Practices*, 6(3), 257-267.
- Brubaker, N. D. (2012). Multiple layers of self in an evolving pedagogy of teacher education: Conflict and compromise in a quest for classroom democracy. *Studying Teacher Education: A Journal of Self-Study of Teacher Education Practices*, 8(1), 3-18.
- Brubaker, N. D. (2015). Critical moments in negotiating authority: Grading, accountability, and teacher education. *Teaching Education*, 26(2), 222-246.
- Buhagiar, M. A. (2007). Classroom assessment within the alternative assessment paradigm: Revisiting the territory. *The Curriculum Journal*, 18(1), 39–56.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.
- Kastberg, S. E. (2014). The power of what we know: Further directions for exploring constructivist model building. *Constructivist Foundations*, 9(3), 352-354.
- Kastberg, S., Lischka, A. E., & Hillman, S. (2018). Characterizing mathematics teacher educators' written feedback to prospective teachers. *Journal of Mathematics Teacher Education*. DOI: 10.1007/s10857-018-9414-6
- Kitchen, J. (2005a). Looking backward, moving forward: Understanding my narrative as a teacher educator. *Studying Teacher Education: A journal of self-study of teacher education practices*, 1(1), 17-30.
- Kitchen, J. (2005b). Conveying respect and empathy: Becoming a relational teacher educator. *Studying Teacher Education: A Journal of Self-Study of Teacher Education Practices*, 1(2), 195-207.
- Kohn, A. (1999). *Punished by rewards: The trouble with gold stars, incentive plans, A's, praise, and other bribes*. Houghton Mifflin Harcourt.
- LaBoskey, V. K. (2007). The methodology of self-study and its theoretical underpinnings. In J. Loughran, M. L. Hamilton, V. K. LaBoskey & T. Russell (Eds.), *International handbook of self-study of teaching and teacher education practices* (pp. 817-869). Springer.
- McClam, S. & Sevier, B. (2010). Troubles with grades, grading, and change: Learning from adventures in alternative assessment practices in teacher education. *Teaching and Teacher Education*, 26(7), 1460-1470.
- Mishler, E. G. (1990). Validation in inquiry-guided research: The role of exemplars in narrative studies. *Harvard Educational Review*, 60(4), 415-442.
- Rogers, C. (1961). *On becoming a person*. Houghton Mifflin.
- Rojstaczer, S., & Healy, C. (2012). Where A is ordinary: The evolution of American college and university grading, 1940–2009. *Teachers College Record*, 114(7), 1–23.
- Samaras, A., & Freese, A. (2009). Looking back and looking forward: An historical overview of the self-study school. In C. Lassonde, S. Galman & C. Kosnik (Eds.), *Self-Study research methodologies for teacher educators* (pp. 3-20). Sense Publishers.
- Schuck, S. & Russell, T. (2005). Self-study, critical friendship, and the complexities of teacher education. *Studying Teacher Education: A journal of self-study of teacher education practices*, 1(2), 107-121.
- Steffe, L., & D'Ambrosio, B. (1995). Toward a working model of constructivist teaching: A reaction to Simon. *Journal for Research in Mathematics Education*, 26(2), 146-159.
- Weissglass, J. (1990). Constructivist listening for empowerment and change. *The Educational Forum*, 54(4), 351-370.

Whitehead, J. (1989). Creating a living educational theory from questions of the kind, 'how do I improve my practice?'.
Cambridge Journal of Education, 19(1), 41-52.



[Alyson E. Lischka](#)

Middle Tennessee State University



[Natasha Gerstenschlager](#)

Western Kentucky University



Jennifer Seat

Middle Tennessee State University



This content is provided to you freely by Equity Press.

Access it online or download it at

https://equitypress.org/textiles_tapestries_self_study/chapter_25.

