CHARACTERIZING FEEDBACK GIVEN AMONG MATHEMATICS TEACHERS: CLASSROOM OBSERVATIONS

CARACTERIZANDO LOS COMENTARIOS ENTRE MAESTROS DE MATEMÁTICAS: OBSERVACIONES EN EL SALÓN DE CLASE

Erin E. Krupa
North Carolina State University
eekrupa@ncsu.edu

Mika Munakata
Montclair State University
munakatam@montclair.edu

The objective of this study is to analyze the nature of feedback given among 58 middle school mathematics teachers participating in a targeted professional development program. As part of the professional development, teachers participated in instructional rounds in which they worked in groups of five or six to observe and give each other feedback on classroom visits. The feedback was written on forms during the observations and discussed during debrief meetings after the observations. This paper characterizes the feedback written by teachers as they observed their colleagues teaching. The preliminary results show that teachers' written feedback was largely descriptive and focused on instructional, rather than mathematical, elements of the lesson.

Keywords: Teacher Education – Inservice / Professional Development, Systemic Change, Instructional Vision, Middle School Education

The purpose of this research is to characterize the feedback middle school mathematics teachers provide to their peers as part of Instructional Rounds (IR). Instructional Rounds have been proposed as an alternative to the periodic, short-term professional development (PD) workshops that are typically held for a few days during the school year or summer (e.g., Goodwin et al., 2015; Teitel, 2015). They involve a collaborative effort among teachers as they observe each other in the classroom and learn from their collective expertise (City et al., 2009). Instructional Rounds exemplify other features of PD programs that have been shown to have an impact on teachers' practice. For example, they take place in the context of schools (Mewborn & Huberty, 2004; Quick et al., 2009) and encourage teachers to collaborate and problem solve as they reflect upon their experiences of teaching (Hawley & Valli, 2000). Specifically, the research question guiding this research is: *How can the feedback teachers give to one another as part of Instructional Rounds be characterized?*

Theoretical Framework

This study is grounded in the premise that IRs are one way in which teachers can learn and improve their practice as they share their expertise and reflect on their own practice with their peers (Kennedy et al., 2011). However, there is a dearth of research on the types of feedback teachers provide to one another on classroom observations. Scheeler et al. (2004) conducted a meta-analysis of research feedback and found that of the 208 teachers included in the meta-analysis, only 9 teachers were inservice teachers. The nature of feedback university supervisors provide to preservice teachers has shown that immediate feedback following a teaching episode (Cornelius & Nagro, 2014) or using bug-in-ear technology during live teaching (Scheeler et al., 2006) can lead to change in practice.

With respect to inservice teacher education, the recent emergence of video clubs for teachers has provided opportunities to study teachers' observation (e.g., Star & Strickland, 2008) and noticing (e.g., Sherin & van Es, 2005) skills. These studies have described the results of the implementation of video clubs (e.g., Beiseigel, 2018; Wallin & Amador, 2018), or have analyzed teachers' responses to viewing rich clips of classroom episodes (van Es & Sherin, 2008). However, more research is needed to understand how teachers provide feedback to their peers and to categorize and describe the nature of their feedback.

Methods

Context

The participants of this study were 58 middle school mathematics teachers from 7 local school districts. The teachers participated in a three-year PD program consisting of a two-week intensive Summer Institute, followed by four days of follow-up PD during the academic year. In the final year of the program teachers participated in IRs, starting with norms development and team-building during the Summer Institute, and involving peer classroom visits and feedback cycles during the school year. Teachers worked in teams of five or six throughout the IR process.

During the PD teachers participated in targeted activities to help them understand the importance of using one another as instructional resources and to practice giving meaningful feedback. After reading an article on the teachers implementing IRs in schools (Troen & Boles, 2014) and discussing the differences in peer feedback and the standard evaluation measures, teachers practiced giving feedback on a classroom video of a teacher not in the program. Then, teachers gave a short model lesson and received feedback from their peers in the audience. In this way, they practiced giving and receiving feedback in a safe space with their teams.

During the school year, every team traveled together to observe each of their teammates' classrooms. The visits included a pre-observation meeting where the observed teacher described their mathematics and instructional goals for the lesson, a classroom observation, and a post-lesson debrief where the observers provided feedback to the teacher.

Data Collection and Analysis

The data for this study came from the observation forms teachers completed during their classroom visits. To record their thoughts for the debrief sessions, each observer was provided with a form with a section for "Mathematics Goal", "Instructional Focus", and "Other". We collected 244 forms for the observed teachers. The observation forms were parsed into units of analysis that were feedback units distinguished from the next by turns in content. In sum, there were 3,595 feedback units in the teachers' observations forms (μ=14.79).

Based on Schwartz et al. (2018), pre-determined codes for the observation forms were used to code the feedback units. The first level codes determined whether a feedback unit was mathematical (M) or instructional (I) in focus. Feedback related to mathematical thinking, mathematics content, terminology, or notation, was coded as Mathematical (M). Comments related to instructional decisions that were not specific to mathematical content were coded as Instructional (I). The second level determined whether the comment was descriptive (D), suggestive (S), or complimentary (C). Descriptive refers to comments that summarize or describe a situation without any intended suggestion or judgement. Suggestive refers to comments that were meant to have the teacher consider alternatives or to question a move or explanation of content. A comment was coded as complimentary if it connoted a positive attribute of the lesson.

If a feedback unit was coded as descriptive (MD or ID), no additional sub-codes were assigned. Each of the *suggestive* second-level code was coded as either *consideration* (C) or *imperative* (I). A *suggestive, consideration* comment indicates that the mathematical objective or instructional focus was not hindered and that the observer was merely giving the observed teacher a question or alternative to consider. An imperative suggestion includes comments that stood in the way of the mathematical objective of instructional focus being met. A feedback unit with a complimentary code (MC or IC), was either general (G) or specific (S). General compliments consisted of phrasings such as "nice lesson", whereas specific compliments referred to a particular instance during the lesson. Examples of each set of codes are provided in Table 1.

Table 1: Coding Scheme with Examples

Level 1 Code	Level 2 Code	Level 3 Code	Examples
Mathematical (M)	Descriptive (M, D)		"Added all angles to make sure they were 180"
	Suggestive (M,S)	Consideration (M,S,C)	"A 'math talk' anchor chart may help guide discussions"
		Imperative (M,S,I)	"Never really answered the question (problem)"
	Complimentary (M,C)	General (M,C,G)	"Topic well covered"
		Specific (M,C,S)	"Loved the calculator analogy—have to know to use the tool properly"
Instructional (I)	Descriptive (I,D)		"Had the kids organized before the lesson started"
	Suggestive (I,S)	Consideration (I,S,C)	"Students may be more willing to share ideas if they can formulate them first on paper"
		Imperative (I,S,I)	"Wait time—need more"
	Complimentary (I,C)	General (I,C,G)	"Ms. K has a very approachable demeanor"
		Specific (I,C,S)	"These tips are a great foundation to encourage more group talk later on in the year"

Reliability

Each feedback unit was coded by two coders. After initial coding, any discrepancies were discussed until agreement was reached. Thus far, 338 feedback units from one team have been coded for this preliminary analysis. The initial agreement between the coders was 89% for Level I codes (M vs. I), 86% for Level II codes (D/C/S), 82% for Level III codes (C/I or G/S). By October, all ten groups and 3,595 feedback units will be coded and analyzed. Results from the first team, Teachers Being Outstanding (TBO) are presented below.

Results

The raw data for the 338 codes provided by the TBO team are provided in Table 2. The most frequent feedback was instructional descriptive (ID). Though the feedback units coded as mathematical were infrequent, when teachers provided feedback coded as mathematical, it was mostly descriptive in nature. Of the suggestive feedback, none were imperative and there were almost three times as many instructional suggestive consideration (ISC) feedback units than mathematical suggestive considerations (MSC).

Table 2: Counts for Each Code Across TBO Team

Code	MD	MSC	MSI	MCG	MCS	ID	ISC	ISI	ICG	ICS
Count	56	13	0	1	25	144	34	0	13	52

An analysis of Level I codes shows that there were 95 feedback units coded as mathematical and 243 codes as instructional. For the level two codes, there were 200 descriptive, 91 suggestive, and 47 complimentary. At level three there were 47 feedback units coded as consideration and 0 imperative feedback units. There were 14 general level 3 codes and 77 specific, however twice as many feedback units, coded as specific, were instructional in nature.

The percentage of each feedback unit code for the TBO group is provided in Table 3. The percentages represent the frequency of each code relative to the total number of feedback units given by the observer for all teachers observed. For each observer, the code that was most frequent is highlighted in gray. Across all six teachers, the most frequent codes were instructional in nature, with the instructional descriptive codes being the most common among the team of observers.

Table 3: Percentages of Each Code by Observer

	MD	MSC	MSI	MCG	MCS	ID	ISC	ISI	ICG	ICS
Ebony	18.87	1.89	0.00	0.00	0.00	58.49	7.55	0.00	5.66	7.55
Condi	27.27	0.00	0.00	0.00	4.55	31.82	4.55	0.00	9.09	22.73
Tammy	20.72	5.41	0.00	0.90	13.51	23.42	9.01	0.00	2.70	24.32
Karmen	7.84	0.00	0.00	0.00	13.73	39.22	11.76	0.00	3.92	23.53
Meegs	16.46	1.27	0.00	0.00	2.53	70.89	7.59	0.00	1.27	0.00
Jameka	0.00	19.05	0.00	0.00	0.00	19.05	33.33	0.00	9.52	19.05

Discussion and Conclusions

These preliminary results show that teachers tend to focus on instructional aspects of mathematics lessons and that it is more common for them to provide descriptive comments than suggestive or complimentary, despite the emphasis on constructive and meaningful feedback during the PD sessions preceding the IRs. It is rare for teachers to provide mathematical or instructional suggestions that they believe are imperative in nature. It will be important to conduct this analysis across the other nine IR teams and to disaggregate the results by observer and by team to determine if there are any differences in feedback based on the structure of the teams.

These results have implications for professional development and mathematics teacher leadership programs. Professional development and programs seeking to develop mathematics teacher leaders should consider developing activities to facilitate teachers' observation skills to include a critical eye for providing feedback to their peers. Whole group discussions, interspersed with IR observations, that provide opportunities to review the feedback and consider ways to make it more meaningful would allow for this type of intervention. A study that describes teachers' growth under this model would be illuminating.

Creating a network of teachers that can provide critical, non-evaluative feedback to one another has the potential to make small incremental and sustainable improvements to teachers' practice. The present study shows that teachers provide a range of different feedback types and also suggests that PD should focus on helping teachers provide more suggestive feedback.

References

Borko, H. & Mayfield, V. (1995). The roles of the cooperating teacher and university supervisor. *Teaching and Teacher Education, 11*(5), 501-518.

City, E. A., Elmore, R. F., Fiarman, S. E., & Teitel, L. (2009). Instructional rounds in education (p. 30). Cambridge, MA: Harvard Education Press.

Christopher DeLuca, Don Klinger, Jamie Pyper & Judy Woods (2015). Instructional rounds as a professional learning model for systemic implementation of assessment for learning, *Assessment in Education: Principles, Policy & Practice, 22*(1), 122-139, DOI:10.1080/0969594X.2014.967168

Cornelius, K. E., & Nagro, S. A. (2014). Evaluating the evidence base of performance feedback in preservice special education teacher training. *Teacher Education and Special Education*, *37*(2), 133-146.

DeLuca, C., Klinger, D., Pyper, J. & Woods, J. (2015). Instructional rounds as a professional learning model for systemic implementation of assessment for learning, *Assessment in Education: Principles, Policy & Practice, 22*(1), 122-139, DOI:10.1080/0969594X.2014.967168

Fund, Z. (2010) Effects of communities of reflecting peers on student‐teacher

development – including in‐depth case studies, Teachers and Teaching: theory and practice, 16:6, 679-701, DOI:

10.1080/13540602.2010.517686

Goodwin, A. L., Del Prete, T., Reagan, E. M., & Roegman, R. (2015). A closer look at the practice and impact of "rounds". *International Journal of Educational Research, 73*, 37-43. doi:10.1016/j.ijer.2015.06.006

Hawley, W. D., & Valli, L. (2000). Learner-centered professional development. Phi Delta Kappa Center for Evaluation, *Development, and Research Bulletin, No. 27*, 1–7

Kennedy, A., Deuel, A., Nelson, T. H., & Slavit, D. (2011). Requiring collaboration or distributing leadership? *Phi Delta Kappan*, *92*(8), 20-24.

Mewborn, D. S., & Huberty, P. D. (2004). A site-based model for professional development in mathematics at the elementary school level. *Pythagoras*, *2004*(59), 2-7.

Quick, H. E., Holtzman, D. J., & Chaney, K. R. (2009). Professional development and instructional practice: Conceptions and evidence of effectiveness. *Journal of education for students placed at risk*, *14*(1), 45-71.

Scheeler, M. C., McAfee, J. K., Ruhl, K. L., & Lee, D. L. (2006). Effects of corrective feedback delivered via wireless technology on preservice teacher performance and student behavior. *Teacher education and special education*, *29*(1), 12-25.

Scheeler, M. C., Ruhl, K. L., & McAfee, J. K. (2004). Providing performance feedback to teachers: A review. *Teacher education and special education*, *27*(4), 396-407.

Schwartz, C., Walkowiak, T.A., Poling, L., Richardson, K., Polly, D. (2018). The Nature of Feedback Given to Elementary Student Teachers from University Supervisors after Observations of Mathematics Lessons. *Mathematics Teacher Education and Development, 20*(1), 62-85.

Sherin, M., & van Es, E. (2005). Using video to support teachers' ability to notice classroom interactions. *Journal of technology and teacher education*, *13*(3), 475-491.

Star, J. R., & Strickland, S. K. (2008). Learning to observe: Using video to improve preservice mathematics teachers' ability to notice. *Journal of mathematics teacher education*, *11*(2), 107-125.

Teitel, L. (2015). Making Rounds Work. *Principal*. *94*(4), 32-35.

Troen, V., & Boles, K. C. (2014). *The Power of Teacher Rounds: A Guide for Facilitators, Principals, & Department Chairs*. Corwin Press.

van Es, E. A., & Sherin, M. G. (2008). Mathematics teachers' "learning to notice" in the context of a video club. *Teaching and Teacher Education, 24*(2), 244-276. https://doi.org/10.1016/j.tate.2006.11.005

Wallin, A. J., & Amador, J. M. (2019). Supporting secondary rural teachers' development of noticing and pedagogical design capacity through video clubs. *Journal of Mathematics Teacher Education*, *22*(5), 515-540.