

THE VALUE OF WENGER'S CONCEPTS OF MODES OF PARTICIPATION AND REGIMES OF ACCOUNTABILITY IN UNDERSTANDING TEACHER LEARNING

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Ongoing efforts to include social contextual dynamics in research on mathematics education require theoretical frameworks that allow researchers to zoom their focus out to include the social sphere (Lerman, 1998). This is especially important when studying teacher development, as teachers learn in a wide variety of social contexts. Here we illuminate two key concepts that are helping us better understand the affects of various communities on the development of our cooperating teachers. These concepts are Wenger's (1998) modes of participation and regimes of accountability. By looking specifically for variation among different communities' regimes of accountability, and the modes of participation they engender, we are able to better understand the development (or lack thereof) that we are seeing take place in our participants.

INTRODUCTION

In a recent special issue of *Educational Studies in Mathematics*, Kieran, Forman, and Sfard (2001), and their contributing authors, present examples of, and potential directions for, the ongoing movement toward inclusion of the social in the study of learning mathematics. This movement, which entails efforts to coalesce cognitive views of learning with social and cultural views of learning in communal practice, has led to much rich theoretical and methodological development. The editors note, however, that this social turn in education research presents a great difficulty. This difficulty stems from the complexity that considering potentially innumerable social factors brings to the task of developing coherent theoretical and methodological frameworks from which to satisfy the need for scientific trustworthiness. Lerman specifies some of those factors:

The mathematical practices within a class or school, the way in which they are classified and framed, the state/community/school values which are represented and reproduced, and teachers' own goals and motives, form the complex background to be taken into account by the research community (Lerman, 2001, p. 101).

We believe that the study of teacher learning presents an especially perplexing case of this problem. Whereas the learning of school mathematics happens for students within an individual classroom community where these other factors can be considered as (certainly essential) "background," we are beginning to understand the great extent to which these other factors are actually part of the foreground for the teaching of mathematics. That is because mathematics teachers participate as adults in the communities formulating the factors Lerman lists, and the teaching of mathematics happens at the intersection of these communities. In our attempts to understand how, why, and what teachers learn, we are increasingly understanding these communities and the multitude of entailments they encompass as the necessary targets of, rather than as a supplementary resource to, our research. We follow others (Zeichner, 1985; Raymond, 1997; Stein, Silver, & Smith, 1998) in adjusting the zoom of our gaze (Lerman, 1998) out to include a broader range of social factors in our research on teacher development.

In this paper we use a case to illuminate two concepts from Wenger's (1998) work – modes of participation and regimes of accountability – that have been pivotal in helping us do just that. Our goal is to illustrate how these concepts have aided our understanding and to propose broader adoption of them as a means of adding to the theoretical coherence of the field of socially-oriented research on teacher development.

MODES OF PARTICIPATION & REGIMES OF ACCOUNTABILITY

Our desire to understand the affects of a range of different communities on the learning and practices of mathematics teachers has led us to operationalize, in a framework for our analytic coding, Wenger's (1998) ideas about the social nature of learning in community. We have done this with a conceptual framework we call mathematics teacher identity (Bohl & Van Zoest, 2002). With this framework we've attempted to delineate and organize the capacities that individuals develop relative to teaching mathematics in a way that makes clearer the relationships between those capacities and the social contexts within which they are learned. The framework places different forms of cognition and social capacity along a continuum from cognitive to social. On the extreme social end are what Wenger (1998) calls modes of participation. These are the ways that people act and interact relative to the endeavors of a social group.

Wenger proposes three forms of activity that comprise a community's modes of participation. The first is mutual engagement. A teacher does this directly in the community of the classroom with her students or in school department meetings with other teachers. This also happens indirectly when teachers act in a particular way as a result of identification with a specific broader community, such as a university's reform mathematics education community (see, e.g., Skott, 2002). The second mode of participation is understanding and fine tuning the jointly-held conception of what is to be done. This happens as participants negotiate their jobs individually and together with the community's end goals in mind. This is particularly relevant to current work in reform mathematics education as the ideal classroom practice, i.e., the end goal, is still relatively ill-defined and open for negotiation. The third mode of participation is developing a shared repertoire of resources, discourses, and styles for accomplishing the necessary tasks. This regards the "how" of actually implementing the types of practice that will support a community's goals.

Modes of participation are learned through engagement with others and, perhaps more importantly, are also entirely embedded within acts of engagement with others. One's competence, or lack thereof, within a community (be it a classroom, a professional organization, or a cohort group of teachers) is related to the ways that one can use knowledge gained from other participation experiences to develop a set of modes of participation that is evaluated positively within the standards of the community.

This concern with the evaluation of individuals' participation is where the concept of regimes of accountability comes in. With this idea, Wenger folds into his conception of communities issues of discursive power and the ways it impacts social activity. A community's regime of accountability is the set of discursive characteristics and administrative arrangements that serve to regulate people's activities by providing criteria and systems for their evaluation. These are both explicit and implicit. Explicit parts of a school's regime of accountability might be a set of rules regarding teachers' need to

adhere to a specific regional curriculum guide to determine what content needs to be taught and when. This can come to bear on teachers through either a regime of official school sanctions related to teaching according to the guide, or through unofficial channels like variations in administrative support. An example of an implicit aspect of a regime of accountability might concern the types and quantity of homework that a community deems appropriate (e.g., as in Forman & Ansell, 2001). Such values might come to affect a teacher through either colleague's differential levels of willingness to engage in conversation about other homework options, or through differential levels of support provided the teacher by administrators when parents question new and different homework assignments.

THE CASE OF SILVIA

To illustrate the way in which we have found the ideas of modes of participation and regimes of accountability useful in the interpretation of our data, we offer a case scenario from our recent research. This case serves two purposes: it illustrates many of the issues that we have seen in our own and others' research studies, and it allows us to frame these concerns within the conceptions described above. Although the case concerns a new teacher, Silvia, many of the issues apply to experienced teachers we've worked with as well.

Silvia graduated from a pro-reform mathematics teacher preparation program and was part of a special project that involved her in professional meetings and development opportunities during the final two years of her program. She came to her methods courses believing strongly in the reform effort because she felt she had not developed much understanding of mathematics herself during her "successful" history of mathematics courses. In terms of actual teaching experience, Silvia participated in several extended periods of classroom participation prior to her internship. She also interned with a reform-supportive veteran teacher who was herself in the process of formulating what a reform-oriented classroom community would look like. Her internship specifically required that she plan lessons using a reform-oriented textbook, and participate in both team teaching and solo instruction over the course of three months. During that time, she established herself as capable and earned the praise of her mentor.

Through her reform-based university coursework, internship in a reform-supportive classroom and school, and many experiences working with reform-oriented teachers, Silvia developed a strong facility with the language and beliefs of the movement. This became apparent in her first job when she found herself serving, relatively successfully, as a spokesperson for her department's reform efforts when parents or the school board needed explanation. She remained active in the broader professional communities which she had joined before beginning teaching, thriving on the sense of mutual engagement toward the goal of improving mathematics education, and drawing much personal strength from her understanding that her efforts to teach in a reform manner were part of a broader national movement.

Within her classroom, however, Silvia had great difficulty developing a repertoire of methods that would support the discourse-oriented classroom community that she described as her goal in several interviews before and during her internship. Her students did not willingly participate in the whole class discussions and activities. When she

attempted cooperative group investigations, students spent much time off task, and when they were working on mathematics they tended to be working individually and using each other only to check the correctness of their answers. There did not seem to be much student development of understanding going on in any of numerous observations.

Troublingly, even though she had a facility with the language of reform and extensive experience evaluating teaching and curricula from a reform perspective, Silvia did not appear to realize the gulf between what she had envisioned earlier and how her current classes were running. She did mention that she was disappointed that she felt she had to tell some students the answers before they would be satisfied. However, she did not perceive that authority problem as dominating her class and turning her whole-class discussions into instances of her dispensing information. She also did not appear concerned about the amount of time students were off-task, or by the fact that there was little substantial conversation going on in her student groups. Indeed she viewed herself as doing a relatively good job of implementing reform, and maintained the belief that she only needed to continue to make small improvements in order to reach her ideal.

In short, her modes of participation as a classroom teacher, specifically her understanding of the task and her repertoire of methods, were very much out of sync with her beliefs both as professed and as exhibited by her modes of participation outside the classroom. Further, her evaluations of her own teaching were much more positive than those of outside observers trained to measure reform instruction. Thus, Silvia seemed to be functioning under a different regime of accountability when in her classroom.

EXAMINING DIFFERENCES AMONG COMMUNITIES

Inconsistencies like those between Silvia's in-classroom and extra-classroom participation were disappointing. She and others had been involved in intense, early, and ongoing participation in multiple communities that supported reform, and had reflected often over a two-year period about what they were seeing in others' classrooms, and what they hoped to achieve in their own. Why was she, then, able to teach in a reform manner less than even moderately well, and only slightly better than others who had not participated in the extra professional and reflective experiences and thus were less versed in reform? Although we are still completing an analysis aimed at addressing this question, our initial findings are indicating to us how the ideas of regimes of accountability and modes of participation provide a coherent framework for considering differential community impact. Here we apply these ideas to Silvia's case as an illustration.

During her teacher preparation, Silvia had been a successful participant in many communities where she had been required to converse and reflect about the tenets of, teaching methodology and curriculum for, and justifications underlying reform teaching. These communities varied in their makeup, but most included both developing and veteran teachers (both reform supporters and reform skeptics), school administrators, and researchers. The modes of participation in these experiences were largely conversational in nature and the regimes of accountability were fairly undemanding. For the most part, successful participation required only reflective, thoughtful conversation about teaching and learning from a reform perspective, and an open mind concerning what it entails. When Silvia moved on to the extra-classroom communities at her job site—her

department and school, the local parents, and the broader professional community—she found regimes of accountability requiring the same conversational modes of participation for her success. Even in situations that involved new dynamics (e.g., discussions with school board members), she was able to utilize her competence because such situations called for modes of participation similar to those she had experienced, and existed within regimes of accountability similar to those she had successfully operated within previously.

In order to understand why a relatively high level of success in these various communities did not translate into a reform classroom practice, it helps to realize that a teacher's own classroom environment is very different from these other communities in terms of what is required for success. This is because the teacher serves as the architect of that community's regime of accountability, within which students function, rather than as an equal co-participant. She acts within the modes of participation that she establishes for herself within that regime, but she is actually not held accountable to it in any real sense. The regimes of accountability within which she acts (or better, to which she is responsible) are those of her department, her school's administration, and the reform community.

Silvia came to her classroom with some experience maintaining a relatively reform-oriented classroom with the help of an overarching authority (the classroom teacher in her field experiences), and no experience either establishing such a community or maintaining one as the sole authority over a group of students. She knew how to discuss the ideal of a reform classroom, but had an insufficiently developed repertoire of resources, discourses, and styles for establishing and orchestrating a regime of accountability that would promote the types of student modes of participation she envisioned. Furthermore, there were no supports in place to assist her in that development and, in particular, no community within which to directly engage in the joint activity of improving the participants' classroom teaching.

Having established some sense for why Silvia had not developed a strong reform program in her classroom, we need to better understand why it is that she was not better able to perceive her shortcomings. We work under the assumption that individuals generally want to experience themselves as being successful, and want others to view them as successful, at the things they choose to do. It follows, then, that individuals will respond in some way to the regimes of accountability of the communities wherein they participate, as it is through those regimes that one's level of success is determined. The immediate regime of accountability to which Silvia felt most answerable was that of her school administrators. The requirements of her administrators were fairly rudimentary, including coverage of material, maintaining a controlled classroom environment, and maintaining positive relationships with her students. However, she wanted to also satisfy the regime of accountability of the greater reform community of which she self-identified as an active member. Further, she needed to accomplish this with a classroom community that she was comfortable orchestrating. In the end, she used "cooperative groups" and "investigations" where students actually worked individually sitting next to one another with the goal of getting correct answers; had students "justify their thinking" by showing all of their work; and "respected students mathematical understandings" by having

excelling students show other students how to get answers. In short, she recontextualized (Bernstein, 2000; Ensor, 2001) the meanings of these reform mathematics terms so that they helped her fulfill several necessary criteria for her success in these various communities. These are: the need to maintain a quiet, controlled classroom where she could cover sufficient material as specified by the regime of accountability of her administrators; the need to be able to describe her practice using the language of reform, as supported by the regime of accountability of the broader reform community; and her need to create a classroom regime of accountability for her students that she and her students felt comfortable working within. This latter regime ended up looking very much like those of the communities with whose modes of participation she'd had extensive practice—the traditional classes of her own mathematical training.

FURTHER CONSIDERATIONS

What we are seeing is that our participants have learned much about the modes of participation that they actually practiced within in our programs, and were better able to transfer that learning to communities where the regimes of accountability paralleled those of the communities wherein they were required to put those modes of participation to use. This is similar to what Boaler (1998, 2002) has documented relative to student learning in different types of classroom communities. She points out that it is not so much the case that students in different types of classrooms (traditional versus reform) develop different *amounts* of capacity, but rather that they develop different *types* of capacity that are related to different types of applications and contexts. Although our tentative finding seems obvious to us in retrospect, we would have been blind to it had we not zoomed our gaze out to include our participants' actions as teachers outside of their classrooms as well as the characteristics of the communities in which they were participating.

Our initial results are helping us develop a sense for the ways that variations in regimes of accountability and modes of participation relate to the transferability of conceptions and action among communities. Although our understanding of the mechanisms of those relations is still tentative, it is clear that the types of community situations where our participants are showing the clearest development are those that are highly similar to the learning situations we provided. We think of this similarity in terms of levels of isomorphism between the learning and application community contexts. The more isomorphic the learning and application contexts were, the more the learning was apparent in application. This is hardly a novel idea; brought to the fore in the current discussion by Brown and his colleagues (Brown, Collins, & Duguid, 1989) two decades ago, this idea has been explored extensively relative to the learning of both mathematics and mathematics teaching (see, e.g., Newmann, Secada, & Wehlage, 1995; Bobis, 2002). The social focus provided by Wenger, though, offers a new perspective that highlights different characteristics of learning contexts that might need to be taken into account in the design of learning opportunities for teachers. As we continue our analysis we will be working to delineate the modes of participation and regimes of accountability of both teacher education and classroom contexts. Our hope is that the resulting knowledge will aid us in our work as professional developers to create communities and activities with regimes of accountability and modes of participation that will improve the likelihood of the learning that takes place becoming a resource for future classroom teaching.

IN CLOSING

Regarding the effects of communities on development, Lerman states that,

As a person steps into a new practice, in social situations, in schooling, in the workplace, or other practices, the regulating effects of that practice begin, positioning the person in the practice. (2001, p. 98)

The social turn in research challenges us to understand those regulating effects and learn how to use them to the advantage of the development of classroom teachers. With this paper we have attempted to illustrate how our own work is moving in that direction. The main point is not so much about the very tentative conclusions we are beginning to draw from our research, but rather about the illumination of the theoretical concepts that are pointing us to them. Wenger's conceptions of modes of participation and regimes of accountability have helped train our gaze on aspects that our analysis suggests are critical when studying teacher development from a socio-cultural perspective. They provide what we believe is a lens appropriate to the task of understanding the complex situation of teaching, where contexts (i.e., communities) vary in form and objective, and overlap to create a hybrid at their intersection in classroom practice. In the introduction we commented on the call to develop a coherent theoretical framework for tying the social into studies of learning. Our hope is that these concepts will become part of that effort, and that other researchers will join us in exploring the implications of the new concerns that they bring into view.

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