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Stories of Supporting Constructivist Pedagogy Through Community

The conceptualization of professional development for educators is shifting from the prevalence of one-shot, quick-fix activities to a lifelong continuum of meaningful experiences, both within and outside of school. The purpose of this article is to examine how 102 educators over a span of three years explored constructivist pedagogy in the Cadre for Authentic Education, a professional development experience grounded in constructivist principles. The analysis of the qualitative data collected throughout the project suggested three stories that reflect the Cadre experiences: stories of frustration, stories of the importance of representing constructivism metaphorically, and stories of community. The stories represented in this article offer readers an opportunity to consider how teachers make sense of their underlying beliefs and assumptions as related to practice in the context of constructivist professional development experiences.

Une évolution s'effectue au sein de la conceptualisation du développement professionnel pour les enseignants. Il s'agit d'un déplacement des activités isolées à solution simple vers un perfectionnement permanent assuré par un continuum d'expériences significatives vécues à l'école comme à l'extérieur de celle-ci. Le but de cet article est d'étudier la façon dont 102 enseignants ont mis en pratique, sur une période de trois ans, la pédagogie constructiviste du «Cadre for Authentic Education», une activité de développement professionnel fondée sur des principes constructivistes. Une analyse des données qualitatives recueillies au cours du projet a fait ressortir trois types d'histoires qui reflètent les expériences des enseignants: des histoires de frustration, des histoires évoquant l'importance d'une représentation métaphorique du constructivisme et des histoires de communauté. Les histoires représentées dans cet article offrent aux lecteurs l'occasion de réfléchir sur la façon dont les enseignants font le lien entre l'exercice de leur profession dans le cadre de leurs expériences constructivistes de développement professionnel d'une part et leurs croyances et hypothèses fondamentales d'autre part.

Introduction

The professional development of novice teachers has attracted increasing attention from researchers in the past three decades (Wideen, Mayer-Smith, & Moon, 1998). The professional development of practicing teachers, although

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somewhat neglected in the past, has also evolved as an increasingly important topic of consideration in recent years (Wilson & Berne, 1999). Although the field has seen increased attention to the ongoing professional development of teachers throughout their career cycle, Lieberman noted in 1996 that "teacher development has been limited by lack of knowledge of how teachers learn" (p. 185).

Wilson and Berne (1999), noting the lack of empirical evidence of how teachers learn, summarized principles and beliefs that have guided the contemporary professional development scene. Citing Ball (1996) and Putnam and Borko (1997), Wilson and Berne suggested that: (a) teachers' prior knowledge and beliefs play a role in their learning and professional development; (b) the context of professional development is important and should be connected to the classroom; (c) time, reflection, and follow-up are important; and (d) teachers need to own and control their professional development. Despite the prevailing acceptance of these principles, the contemporary professional development scene can be characterized as staff development sessions and workshops that are often intellectually superficial, disconnected from deep issues of curriculum and learning, fragmented, and noncumulative (Ball & Cohen, 1999). Furthermore, because scant research is available for supporting policymakers and teacher educators in providing quality professional development opportunities for teachers (Lieberman, 1996; Wilson & Berne, 1999), there is increasing need for research that focuses on how teachers learn in relation to the professional development of practicing teachers.

In view of the need for research and enhanced understanding of professional development, the purpose of this article is to share what our research suggests about how teachers learn. We base our comments on a three-year professional development initiative, Cadre for Authentic Education (Cadre). The stories of Cadre and the conclusions that we offer are based on our experiences as lead facilitator (Jenlink) and evaluator (Kinnucan-Welsch) in the initiative. The goal of Cadre, and the research activities embedded in the initiative, was to explore and understand ways to offer professional development to educators that were meaningful and sustainable in ongoing classroom practice.

A Description of Cadre

Cadre was a three-year professional development experience for several educators who were living and working in a rural area of Michigan, United States. Cadre was a metaphor adopted to reflect a focus on the professional development of teachers as constructivist leaders using a community of learners as the organizing frame. The concept of Cadre also reflected a collective identity of the teachers across communities of practice.

The initiative was funded by the Michigan Department of Education under US Department of Education Goals 2000 authorization. The fiscal agent for Cadre was an intermediate school district in southwest Michigan. Intermediate school districts serve as regional support for local school districts by providing professional development opportunities, technology support, vocational and technical education facilities, and various other services and programs. Funding from this initiative supported participation through stipends and release

time for Cadre participants to attend follow-up sessions in the weeks and months following the two-week summer immersion experience.

The original purpose of Cadre was to change the classroom delivery of a group of math and science teachers from a teacher-directed, product-oriented approach to curriculum and instruction to a more active-engagement and process-oriented approach framed from a constructivist perspective of learning. The first Cadre (Cadre I) was authorized in 1994 and supported a total of 20 participants across seven school districts, including 19 teachers and one teaching assistant.

The positive response to Cadre I prompted the facilitators to seek funding from the State of Michigan for another Cadre, and Cadre II was authorized in 1995. The response to Cadre II was in many respects overwhelming. The desire to participate was in part due to the interest generated by the powerful recounting of experiences by Cadre I members from the previous year. As the number of educators wishing to participate in Cadre II was too great to manage in one group, groups situated in three geographic regions throughout the county were organized. The decision to do this was based on both the number of participants and the facilitators' conviction that bringing the professional development into the regional areas would support local ownership and deemphasize control from the intermediate school district. The three groups of Cadre II became designated as Cadre South (37 participants), Cadre North (22 participants), and Cadre West (23 participants). A total of 102 educators, including teachers, administrators, community educators, and teaching assistants participated in Cadres I and II across the three years of the project.

Constructivism as the Conceptual Frame

Constructivism served as the conceptual frame for Cadre. Constructivism as a theory of knowing (Noddings, 1990; von Glaserfeld, 1990, 1995) and a philosophy of how we come to know in social contexts (Gallimore & Tharp, 1990; Tharp & Gallimore, 1988; Wertsch & Toma, 1995) is a complex phenomenon that many educators are struggling to define (Oxford, 1997; Richardson, 1997). Despite the evident differences among theorists in characterizing constructivism as a theory of learning (Fosnot, 1996), consensus is emerging. As Oxford (1997) notes, "in most people's minds, constructivism refers to the philosophical belief that people construct their own understanding of reality (although some constructivists go even farther by saying there actually is no reality outside of people's constructs or ideas)" (p. 36). Richardson (1997) suggested that from a constructivist perspective, "individuals create their own new understandings, based upon the interaction of what they already know and believe, and the phenomena or ideas with which they come into contact" (p. 3).

Professional development for practicing teachers grounded in constructivist principles of learning has also been difficult to define, and the research has been limited. What research is available, however, is enlightening. Lampert (1997), in revisiting a professional development project for teachers at the Division for Study and Research in Education at the Massachusetts Institute of Technology, remarked that some 17 years after the project was completed, "we still have few tools for examining how teachers cope with practical dilemmas and we know little about how to teach teachers to cope" (p. 85). Kinnucan-

Welsch and Jenlink (1998) found that community and immersion into practice were necessary supports for meaningful teacher learning from a constructivist perspective. Rosebery and Puttick (1998), using a case study design, found that teachers need to grapple seriously for extended periods with complex ideas and connected practice in classrooms. The goal of Cadre was to extend what educators are tentatively suggesting about constructivist professional development.

Richardson (1997) noted that “the place to develop constructivist praxis is in classrooms, with teachers and teacher educators who are interested in pushing theory and practice ahead” (p. 12). Cadre was designed to push theory and practice with teachers and teacher educators learning together. The basic tenets of constructivism incorporated into Cadre included recognizing that learners construct their own meaning and that learning most powerfully occurs in a social context with the assistance of others. The power of building community (Cochran-Smith & Lytle, 1999; Ford Slack, 1995) was affirmed in all Cadre activities, and as facilitators we blended the importance of the individual learner’s construction of knowledge with the importance of the sociocultural context in learning.

Readings relevant to creating more constructivist environments were mailed to the participants before the first session. The text *In Search of Understanding: The Case for Constructivist Classrooms* (Brooks & Brooks, 1993) was purchased for all participants and served as a reference throughout the experience. The language and concepts of social constructivism were also woven into the Cadre experience. Scaffolding, peer-assisted and expert-assisted learning, and building community were incorporated into the design of daily learning activities. The importance of the social context of learning was highlighted in the Cadre design and in the continual adjustments of activities during the two-week immersion.

As a professional development experience Cadre was designed and organized around six components: (a) a two-week immersion in reading, dialogue, and reflective journaling about the nature and process of constructivist pedagogy; (b) a period of practice with students from grades 1-12 (ages 6-18) occurring during the five mornings of the second week of immersion; (c) bimonthly follow-ups to refresh and support; (d) a design process preceding the two-week immersion and each follow-up; (e) a one-to-four facilitation ratio between Cadre staff and participants; and (f) action learning, in which small groups of participants engaged in study and reflection on their own practice. A description of these components follows.

The first component, the two-week summer immersion into the principles and pedagogy of constructivism, was the core of Cadre, providing the foundation on which the follow-up activities during the academic year were based. During the first week the participants and the Cadre staff of co-facilitators engaged in activities and dialogue (Cooper, 1995) about classroom experiences, personal and professional philosophy, and values and beliefs about teaching and learning. The goal of the activities and dialogue was to encourage the participants to challenge currently held assumptions about teaching and learning, seeing both anew through a constructivist lens. An immersion and distancing (Lester & Onore, 1990) process was employed during the two weeks. The

immersion into readings, presentations, and role-playing was followed by distancing and reflection through dialogue. Every Cadre session was videotaped, and these taped segments also offered the opportunity for participants to immerse themselves in a learning activity by watching the videotape and reflecting on the learning experiences of the participants.

The second component of Cadre was the period of practice with students from grades 1-12 (ages 6-18) during the second week of the summer immersion. During this week students from the surrounding districts joined the participants for five mornings of learner-centered activities as students and participants collaborated in problem-based curriculum. For example, a problem in Cadre II South included creating a sustainable environment under water, known as a hydrosphere. One key aspect of the Cadre experience was to engage the participants (teachers and administrators) as co-learners with the student participants. As co-learners with the students, the Cadre participants approached the problem context not with predetermined solutions that the students were expected to accept, but as expert assisters (Tharp & Gallimore, 1988), partners, and resources in the learning process. The idea was for students, with assistance from teachers who were Cadre participants, to co-construct solutions to the problems they encountered.

The third component of Cadre was a series of bimonthly follow-up meetings during the academic year for Cadre participants following the two-week immersion. These follow-ups consisted of common readings, sharing of recent classroom experiences, constructivist activities, and dialogic conversation (Hollingsworth, 1994) about some aspect of constructivist teaching and learning.

The fourth component included a constructivist-oriented design process that charted the course of Cadre. During the initial information meeting held each spring, an invitation was extended to any participant to be involved in the design team. The team met before the two-week immersion and the follow-up sessions and made decisions about the direction of Cadre for the group. Project facilitators, working with members of each Cadre, examined issues of professional development through the lens of educational systems design. The purpose of the design process was to engage Cadre members in taking responsibility for their own professional growth and learning. This was accomplished by focusing on principles of constructivism, particularly as they related to professional development (Lave & Wenger, 1991; Moll, 1990)

The fifth component ensured that the ratio of one facilitator to four participants was built into the Cadre design. This ensured sufficient facilitators to manage logistics, attend to the learning environment needs of the participants, and to support one another in advancing their own understanding of process facilitation and constructivist professional development. In addition, separate follow-up sessions for the co-facilitators became a regular part of the process. This provided a context to enable the facilitators to distance themselves from their own performance as facilitators and learn through reflection in their own learning community.

The sixth component, action learning, was grounded in disciplined inquiry and constructivist principles. It allowed some participants an opportunity to continue their professional and personal growth in a collective inquiry and

learning process. Teachers who became involved in this component of Cadre came together initially for a two-day retreat in the fall following the two-week summer immersion. This retreat was key in reconnecting with the principles of Cadre and with each other. Reading, reflection, and dialogue were essential aspects of action learning, particularly as they focused on questions of practice.

Method

Participants

Participants for Cadre were recruited from information meetings that were held in each of the local districts served by the intermediate school district. Most of the participants were teachers, despite an effort to recruit administrators. All grades from kindergarten through high school were represented. One principal and one community education administrator participated, as well as one teacher's aide and one preservice teacher. Participants received a \$500.00 stipend and \$200.00 for professional materials.

Data Collection and Analysis

We incorporated an educational case study design (Merriam, 1998) for the evaluation and research study. We were participant observers for the sessions, both in the two-week immersion and the series of follow-ups. We included multiple data sources to triangulate across perspectives, as well as multiple points in time spanning the three years of the initiative.

All participants kept a daily journal. We built in reflection time each day of the two-week summer immersion and encouraged the participants to continue to keep a journal during the follow-up period in the year after the summer immersion. The participants were assured that the journal was primarily for their reflections and that sharing the entries with us was voluntary. Most participants willingly shared.

In addition to the journals, Cadre participants shared their impressions and reflections on the project twice during focus group interviews. One set of interviews was conducted immediately following the summer immersions; the second set was held in the spring following one year of implementation. The first author conducted the focus group interviews. Data sources also included numerous artifacts from the two-week immersion and the follow-up meetings, including videotape footage, productions from the learning activities, still photographs, and field notes.

Focus group interview and journal entry data were coded according to themes and categories (Merriam, 1998). Because we wished to explore from the participants' perspectives their experience of Cadre, we did not impose previously determined codes. We started with an open coding process, and then refined our codes by collapsing them into categories as the process evolved. We focused on descriptions of the experience that would help us understand Cadre as a constructivist professional development initiative. The artifacts and still photographs were examined and interpreted in light of emerging themes. We viewed the videotapes of the sessions and wrote narrative responses about our impressions in our research journals. All coded data were examined for categories, themes, and negative cases to construct a representation of the Cadre experience. Three themes from a set of several that emerged from the data are examined in this article. We chose these themes because they highlight aspects of Cadre that represent a constructivist frame for professional development.

Other stories of Cadre may be found elsewhere (Kinnucan-Welsch, 1995, 1996; Kinnucan-Welsch & Jenlink, 1996, 1998).

Findings: Stories of Cadre

The participants in Cadre had the opportunity to develop their conceptual and practice-oriented representations of constructivist principles and pedagogy over a three-year period. Cadre I members participated in monthly follow-up meetings the year following the two-week immersion, and Cadre II had opportunities for bimonthly follow-ups. In the following sections, we describe the Cadre experience through three themes that reveal how the participants grappled with shifting mindsets of practice. We also chose these themes because they were evident in all three Cadre groups. The stories through which we examine participants' experiences include early frustration, the importance of metaphor in the Cadre experience, and the evolving sense of community.

Grappling with the Philosophy and Practice: Early Frustrations

Key aspects of the two-week immersion experience included building a community of learners and exploring how to bring students into the center of the learning process, that is, how teachers can be co-learners with students. For many Cadre participants, building community was a recognized element of creating a safe space in which to learn and to take risks. The focus on process in the first week of the two-week immersion, however, left many participants feeling they really did not know what Cadre was all about, and left many with questions about the specifics of implementing constructivist pedagogy in their classrooms.

On the first day of all four summer Cadre immersion experiences, the teachers were asked to share in writing the concerns they had about exploring authentic education and building a constructivist classroom. Examples from responses regarding initial concerns include several comments that highlight the themes of frustration as they looked forward to the coming school year. One teacher from Cadre West said, "My concern is that in two weeks I will not develop a 'habit' of constructivist teaching ... Will I revert to what's familiar during the school year?" Another teacher from Cadre West commented, "My largest concern at this time is: will I be able to translate/use this in my elementary classroom?" A veteran teacher examined this same worry from her perspective:

As an old, experienced teacher who has seen fads (trends) come and go, do I have the flexibility and open-mindedness to change in my thinking and implement changes in my classroom? I'm so left-brained; need order and stability. Can I let some old ways go and take a risk?

Teachers expressed two areas of concern on the first day of summer Cadre. First, they had immediate concerns about working with the children during the second week of Cadre. The major concern, however, was related to the uncertainty they felt about implementation in their classroom, a dilemma they would encounter when school started in the fall. These two areas of concern were consistent patterns for each of the four Cadres.

Uncertainty and frustration were further exacerbated by the focus on process and the expectation that the participating educators should assume the role of facilitator of student learning. These elements of Cadre, process and

facilitation, required that the participants wrestle with the issues of control that often face teachers, and left many with a real sense of frustration. The following comments represent journal entries from two participants in Cadre II:

Today, when listening to other people's opinions, I became very frustrated, impatient, and at some times, even intolerant of the amount of time spent on a subject matter or a specific problem. This bothers me because if I have such a time listening and staying focused on the interactions in this setting, will I have the same reactions to discussions and interactions in my own classroom? The way I see my own role as a teacher is to be able to listen and allow students to voice opinions and ideas. Maybe I won't be able to handle this successfully and fall back on more comfortable teaching styles (and maybe today was just a bad day). (journal, Cadre II West participant)

I was very frustrated this morning. I felt everyone was getting too worked up. I wished they would be more flexible and less controlling. (journal, Cadre II South participant)

The above comments reflect the frustration with the process that was embedded into the Cadre experience; that is, the time to think and reflect on the topic under discussion. This type of professional development experience, where reflection, process, and a time for constructing meaning in the context of practice, has not been commonplace for teachers. The more typical professional development follows a packaged, prescriptive, "sit-and-get" mode. The teachers in Cadre, as evidenced from these comments, were experiencing the frustration that comes from the uncertainty that is often embedded in reflection.

The teachers also shared their thoughts about frustration and uncertainty in focus group interviews conducted in the spring of the year following the summer immersion. These interviews were an important opportunity for the participants to reflect on how their beliefs and practice were evolving. Follow-up sessions had been conducted throughout the year following the summer immersion, giving the teachers regular opportunities to engage in activities that encouraged deepening their understanding and integration of constructivist principles and practice.

Cadre I teachers brought an interesting perspective to the focus group interviews after one year of follow-up meetings. By the spring of 1995, the second Cadre grant had been awarded, and design teams from Cadre II had already begun the design process for the groups that were to engage in immersion experiences during summer 1995. During the focus group interviews in May 1995, the Cadre I participants shared with humor and empathy a sense of knowing what the Cadre II participants were about to encounter. One of the Cadre I teachers put it this way:

One thing I've learned and that I tell people, especially the person being frustrated, is that you have to put yourself in a very uncomfortable position in order to grow. And that's what Cadre does. It puts you into a position that you're not used to, but it's also a position that we often put students into. And that from there you grow and start to get a better understanding on how we learn, how we can take on the learning process. (Cadre I focus group interview)

The teachers recalled the sense of uncertainty that accompanied the questioning of current practice in which each member engaged in those first days of Cadre. Despite the disequilibrium they encountered, however, many par-

ticipants recognized that frustration was a necessary part of the process of learning and growing.

One of the Cadre II teachers, after one year of follow-up sessions, reflected on this sense of disequilibrium in the focus group interview conducted in the spring of 1996:

If you see yourself on a trampoline—sometimes you're flying high and it's a thrilling experience and sometimes you feel like you're going to fall off the edge and you can't stand being on it. Other times it's a firm base and you hit it, but you have to be able to give as you're coming down and going up and you get more when you have some give, but you never lose your support. If you lose contact with your base, you're not going to have anything. If you know how to give and move with your base, and have some basic idea of how the system works and can challenge the system, then you can do many things. But at the same time, you have that knowledge and work within it because if you don't, then you fall off. (Cadre II South focus group interview)

The passage of time did not dim the memory of those early frustrations. In February 1997 several of the Cadre participants came together for an all-Cadre reunion. These follow-up sessions were not funded, so this was an opportunity for participants to come together and share where they were in their lives and practice. For Cadre I participants this reunion was almost three years after the initial experience. The following comments are taken from an artifact of the day, a travelogue to which each person contributed some thoughts about Cadre as an experience. Again the theme of frustration surfaces:

Prior to beginning my journey, I felt frustrated, wanting to allow learners the control, but manacled to traditional teaching and assessment. I struggled and fought my professional existence, exercising my true self in another venue. (All Cadre travelogue)

Frustration is one of the narrative elements of the stories of Cadre. The teachers often told their stories of frustration when they came together for follow-up sessions to reflect on how they were continuing to integrate more constructivist pedagogy into their classrooms. But the sense of exhilaration and promise was also part of their stories, and this was revealed through exploring metaphors as part of the Cadre experience.

The Metaphors of Cadre

Metaphors played an important role in the evolving perception of what Cadre was as an entity for professional development and what constructivism embraced as a way of knowing and thinking about pedagogy. Many of the immersion and follow-up activities engaged the participants in representing constructivism through metaphor as a way of knowing and Cadre as a professional development experience. One summer Cadre activity in particular immersed participants into the world of metaphors.

The Mobiles of Learning—or, as the participants called it, the mobile activity—engaged participants in comparing their current classrooms and practice with a representation of a constructivist classroom. The Mobile of Learning, designed by the second author, used the art form of a mobile, which has roots in the arts-based disciplines. Connected to the mobile was the concept of changing mindsets related to participants' understanding of teaching and

learning, particularly in the context of their classrooms. Based on collective conceptualizations, the groups created mobiles of learning with two sides, one representing their own classroom and the other a constructivist classroom.

This activity was key to the Cadre experience both as an immersion and distancing activity and as part of the research methodology. Cadre participants had the opportunity during the two weeks to represent their evolving conceptualizations of constructivism as pedagogy through metaphor as they constructed their mobiles graphically and spatially. Furthermore, participants could see how their evolving conceptions were beginning to challenge their operant notions about teaching and learning. The mobiles also became an important data source through which all participants could enhance understanding of the experience as individuals and as a collective.

The mobiles revealed unique interpretations of constructivism and a sense of what Cadre represented to each member as a professional development experience. For example, one group from Cadre II South represented the traditional classroom as three primary colors; in the constructivist classroom the teacher was seen as the artist's hand holding a paintbrush, and the student's hand was laid on the artist-teacher's hand. Another group used a puzzle as metaphor. In the traditional classroom all the pieces were disconnected; in the constructivist classroom the following characteristics surfaced: (a) unlimited possibilities, (b) adaptation to the situation and the needs of the learner, (c) the possibility of an unfinished puzzle, and (d) no specific pattern.

As each group described their mobile, many of the theoretical tenets of constructivism were highlighted through language and through symbolic representation. Each group, however, commented that much of their current practice would be taken from the traditional side and incorporated into a constructivist classroom. For many this posed a dilemma as the necessity of seriously examining theoretical foundations became apparent to some. This dilemma was revealed in the following comments from Cadre II South participants:

I am still thinking quite a bit about how will this fit into my classroom. Realizing that constructivist ideas cannot be used all of the time, I need to give thought to when I should input this type of activity. (journal)

The co-learners (teachers) seem to be struggling with some basic premises/foundational principles about constructivism. Perhaps this shouldn't be a concern—it may be a sign of growth! (journal)

Concern—lack of philosophical/foundational pieces to internalize this or attempt to integrate it. (journal)

One Cadre member revealed a personal insight about constructivism and the process of professional development during the mobile description:

Really, I think that I have many of the pieces of a constructivist classroom in my classroom now and all of us did, but none of us felt that we were constructivist teachers. You can have all the pieces and not be constructivist. It's, I think, what you do with it. (journal)

Cadre North participants also constructed mobiles of learning, and several metaphors were visually represented. Examples included an umbrella, which encompassed many facets of constructivism; and a tapestry, which wove the

tenets of constructivism into traditional theory and practice. The tapestry or weaving offered several symbolic representations of a constructivist classroom. The materials, natural and irregular such as ivy and wheat, represented children's natural curiosity. Cheesecloth represented the filtering of new ideas. An electronic cable represented the flow of energy through life. Ivy represented new beginnings. The teachers emphasized in their representations what they could take from their current knowledge and practice to forge a new way of thinking about teaching and learning. The mobiles became physical representations of how their classrooms might look.

The metaphorical representations of Cadre II West also reflected the current mental constructions of the participants. One group portrayed the current classroom of their group collectively as a pyramid, with the teacher at the top as a source of all knowledge. On the other side of the mobile, a constructivist classroom was represented as a sphere wherein everything was interconnected and the teacher was "in there somewhere." Another group suspended their representations of both the current classroom and the constructivist classroom from a mobius strip, a strip of paper twisted once with ends glued together to present a single edge that turns back on itself. The strip indicated that current practice and the construction of a constructivist environment are fluid with one another; that there must be a balance and a holistic approach to looking at practice in the classroom.

The Mobiles of Learning became a centering activity for the participants. They were not bound by the constraints of language to represent their thoughts about constructivism and their current practice. Enthusiasm and humor often bubbled to the surface during the small-group time allocated every day to work on the mobiles. In many ways the Mobiles of Learning became a representation of Cadre itself as a way to connect current practice with what was possible and to connect with one another as a community of learners.

The Importance of the Community

For most of the participants the importance of Cadre lay in the sense of community that was evolving among the participants. Each Cadre group formed a distinct community based on the experiences unique to each immersion and follow-up session (Kinnucan-Welsch & Jenlink, 1998). But a sense of connection among Cadre participants across groups was also evident. Many factors contributed to the bonds that connected Cadre members. First, the sense of frustration felt during the summer immersion was a common experience that became part of the folklore of Cadre. The stories that the teachers told one another in follow-up sessions and during focus group interviews often incorporated laughter and humor, often about the frustration of grappling with changing mindsets and challenging currently held assumptions. The teachers represented this sense of community, and how important it was to them, through metaphorical images. One teacher from Cadre II West shared the following during a focus group interview after one year of Cadre experience:

Katie: What image comes into your mind when you think of Cadre?

Donna: A fish net, because I think all of us at our different schools feel like we all feel connected, I think. I think that was probably one of the best things to come out of Cadre was just the fact that so many people networked and by the time it was over, I think we all felt like we probably knew each other pretty well. And I

still see that as great. A great net that we are connected in. (Cadre II West focus group)

Another Cadre member saw Cadre as community differently:

I have this picture of Cadre as a ride at Disney and you are accelerating forward and Cadre, this support group, is my cocoon. (Cadre II North focus group)

Another participant from Cadre II North simply stated:

One of the real valuable things is the relationship that was developed with the other people, and I know throughout my career I am one of those people and I know how valuable that is. (Cadre II North focus group)

For many of the participants the follow-up sessions and continued contact with Cadre colleagues were essential elements of the personal and professional growth. The sense of isolation among teachers has been well documented (Lieberman & Miller, 1984), and Cadre afforded the participants an opportunity to engage in meaningful dialogue, activities, and reflection about constructivist pedagogy and their practice. As the funding cycle came to a close, the teachers were faced with the harsh reality that what had become so important in their lives would change dramatically. The following comments indicate their feelings about returning to isolated ways of being:

Katie: How has your perspective on teaching changed?

Pat: Mine has regressed in the last two months, I'm sure. I've missed the last get-together and I am kind of isolated in my area and I haven't been pushed or reinforced. (Cadre II West focus group)

Comments from another teacher also stress this theme:

Katie: What are your thoughts now after one year of Cadre?

Chuck: I mean, we are a family and the specter of not having follow-ups next year was painful. (Cadre I focus group)

It was clear, however, during the all-Cadre reunion in February 1997, that Cadre did have a lasting impact on many of the participants. Teachers continued to share with each other their successes and challenges in incorporating a more constructivist pedagogy in their classrooms.

The importance of community is highlighted in perhaps one of the most articulate statements of what Cadre represented to the participants. This written statement came from an activity in one of the follow-up sessions in which the participants were asked to define Cadre:

Cadre was intended to be a short, convenient name for summer programming for staff development in math and science through constructivist philosophy. Over the last two years the word *Cadre* has come to refer to the learning community of educators who seek strategies and support for transforming themselves and their classrooms into constructivist teachers in a constructivist environment. (Cadre I artifact)

The teachers who participated in Cadre began to see themselves as part of this community that supported learning and growing in ways that were transforming for many of them.

Lessons Learned About Professional Development

Every encounter with Cadre afforded us the opportunity as university-based educators involved in teacher preparation and continuing professional development to deepen our understanding of how teachers learn. We would like to emphasize four central themes that others might consider when thinking about designing professional development opportunities at the university or local level.

First, professional development is a complex phenomenon unique to each individual as he or she constructs meaning from the experience. This conclusion is consistent with the other research and theoretical literature on professional development (Rosebery & Puttick, 1998). By incorporating constructivist principles into Cadre design, the facilitators offered participants numerous and varied opportunities to develop their own meaning constructions of constructivist pedagogy and practice over an extended period. In designing Cadre as a professional development initiative, we were committed to avoiding those workshop and inservice structures that have, as Lieberman (1996) suggested, largely ignored how teachers learn. Instead, we engaged the participants in an initial experience that was two weeks in duration. This was long enough to address issues of substance and to allow for that critical immersion and distancing cycle that promotes uncovering deeply held assumptions. The Cadre design also allowed for actual hands-on experience with students as part of the process. This too was in keeping with constructivist principles.

Second, it was also apparent from the travelogue responses and focus group interviews that the opportunity to learn with peers and colleagues was one of the powerful and lasting aspects of Cadre. The construction of community was paramount, and participants experienced the value of assistance and support from others in the perilous journey of challenging one's assumptions about teaching and learning. One of the Cadre groups continued to meet as an action learning/action research group long after the funding had ceased. For these teachers the opportunity to learn and grow in a community of reflective practitioners was something they were unwilling to abandon. Cochran-Smith and Lytle (1999) discussed this emerging theme in their research on professional development. They suggest that structures of schools do not support teachers in developing and sustaining learning communities. We found in Cadre that the challenge for us was to provide contexts in which teachers can grow and learn through interaction with others in deep and meaningful ways as part of a learning community. As a professional development experience, Cadre afforded that opportunity to many.

Third, we found that long-term professional development efforts grounded in the day-to-day practice of the participants over extended periods reap benefits in enhanced understanding for teachers and facilitators. Through this initiative we all deepened our understanding of constructivism as a way of learning and as a way of teaching. Each follow-up session in the year following the summer immersion extended the learning of individuals and the group. We were able to embed our discussions of constructivism in the unique classroom experiences that each participant brought to the follow-up sessions. Cadre as a professional development experience was not disconnected from the teachers' daily lives, as is the case in many of the workshops and inservice

training offered to teachers. Cadre was “centered in the critical activities of the profession—that is, in and about the practices of teaching and learning” (Ball & Cohen, 1999, p. 13). Consequently, during the follow-up sessions we all learned from stories of bringing a constructivist approach to teaching in the classroom, from the grade 2 classroom to the high school science classroom.

Fourth, we found in the concerns that were voiced at the beginning of the initiative, as well as in the focus group interviews at the end of one year, that administrator support is key to success in innovation and change in pedagogy. This is no surprise, as the literature on professional development has highlighted the importance of embedding professional development in a comprehensive change process in which the administration must be involved (Hawley & Valli, 1999). Some teachers reported that administrators did not understand the changes that were taking place in classroom organization and instruction. Cadre promoted student engagement in active learning, and this often meant classrooms filled with the lively, but substantive conversations of small groups of students. One high school teacher reported that her principal came in to observe her for her annual observation. The students were in small groups solving a problem related to energy, and the teacher was moving about the room supporting the students on an as-needed basis. The principal told her he would come back when she was really teaching. It would benefit all if teachers and administrators could participate in professional development experiences together throughout the year and have extended conversations about pedagogy. We felt that this was one aspect of Cadre in which we did not accomplish what we had hoped.

As we reflect on the Cadre experience as a whole, however, we believe that 102 educators engaged in meaningful professional development for an extended period. Teachers who were part of the Cadre experience have said time and again that they will never go back to traditional ways of staff development delivery. The question that remains, however, is how do we support meaningful and contextually embedded professional development on a broader scale? Perhaps our experiences will encourage other educators to consider this question in their own places of practice.

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