How Do Cognitive and Motivational Factors Influence Teachers' Degree of Program Implementation?: A Qualitative Examination of Teacher Perspectives

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ABSTRACT

Understanding the reasons why teachers vary in their implementation of educational interventions is essential to developing more effective professional development programs. This article used qualitative methods to illuminate and examine the cognitive and motivational dimensions that impacted teachers' adoption of an innovative early childhood education program. The teachers' perspectives regarding "what worked" and "what did not work" helped coalesce a set of themes and recommendations that can be used to inform future professional development efforts.

Introduction

No matter how innovative and well-designed an educational intervention may be, it will be ineffective unless teachers are provided with appropriate professional development to support program implementation. Yet the process of implementing and sustaining a new program often meets with uneven success wherein some teachers enthusiastically integrate concepts into their classrooms and other teachers either never make the effort or quickly give it up. In order to develop more effective professional development programs, it is essential to comprehend the reasons why teachers vary in their degrees of program implementation. The purpose of this exploratory qualitative case study, then, was to examine the cognitive and motivational factors that affected teachers' degree of implementation of an authentic problem-based early childhood education program.

This study is an offshoot of a larger professional development partnership, in which university faculty members at an education department collaborated with a local

public elementary school in a major metropolitan city to implement an early childhood authentic and problem-based educational program. The first author of this study conducted semi-structured interviews with four classroom teachers who had implemented the program with the evaluative intent of uncovering the cognitive and motivational factors that had helped or hindered the teachers' implementation. Though the original purpose of the interviews was to serve as a formative evaluation to refine and improve the program, the teachers' perspectives regarding comprehension and motivation were sufficiently broad that they could serve to refine a theoretical and practical understanding of how to successfully implement professional development programs.

Research on motivation comprises a vast area in the literature; however, most of it focuses on student rather than teacher motivation (Butler, 2007). Furthermore, present models of professional development do not sufficiently address the cognitive and especially motivational issues in program implementation from a teacher perspective. A major contribution of this study to the professional development literature is to "give voice" to teachers by garnering their own perspectives on how teacher comprehension and motivation could be improved to achieve professional development goals. By illuminating the factors that affect teachers' decisions to implement programs and maintain implementation over time, a better understanding will be achieved regarding what matters to teachers and how best to motivate them (Ozcan, 1996).

In a practical sense, findings from this study allow formulation of a best practices framework for program implementers that address both cognitive and motivational aspects of professional development. This framework is aimed at anyone who plans to implement professional development programs; however, the recommendations are especially useful for university faculty who work in partnership with schools. These guidelines can be used to increase the degree of program implementation and thus create more effective professional development partnerships.

Literature Review

This article examined teacher performance and degree of program implementation from the perspectives of cognitive science and motivational research. By way of background and before launching into a review of the cognitive and motivational theoretical models that are used to undergird this study, the next sections will present a brief review of the tenets of effective professional development as well as a synopsis of the professional development schools (PDS) model's essential principles.

Effective Professional Development

Research on effective professional development reveals the following essential criteria for success: providing opportunities for practice, research, and reflection; embedding professional development in daily work; sustaining professional development over time; and creating a sense of collaboration and community among teachers and between teachers and principals (Sparks, 2002). Reitzug (2002) synthesized findings from professional development research into principles. He pointed out that professional

development should take place over an extended period of time, model effective pedagogy, focus on communities of practice instead of individual teachers, and provide follow-up support in terms of modeling and coaching.

Indeed, the consensus in the literature is that professional development efforts should create ongoing support structures and develop collaborative communities of practice in order to ensure effective implementation and sustainability. In particular, professional development activities and follow-up should build community and sustainability through structures like mentoring, modeling, coaching, and increasing leadership capacity (Elmore, 2002; Fullan, 2002; Schmoker, 2004).

Elmore (2002) wrote about this need to create collaborative communities of practice while also noting that professional development efforts should aim to effect systemic change, not just individual teacher development:

> Professional development, in the consensus view, should be designed to develop the capacity of teachers to work collectively on problems of practice, within their own schools and with practitioners in other settings…this view derives from the assumption that learning is essentially a collaborative, rather than an individual, activity – that educators learn more powerfully in concert with others who are struggling with the same problems – and that the essential purpose of professional development should be the improvement of schools and school systems, not just the improvement of individuals who work in them. (Elmore, 2002, p. 8)

Professional development schools (PDS) were designed to support exactly this kind of broader systemic improvement and will be discussed in the next section.

Professional Development Schools, Their Context, and Cultures

The traditional model of professional development is delivered in one- or two-day in-service workshops and has been recently criticized in the professional literature because it is not integrated with the school community, does not form collaborative learning communities, and does not provide opportunities for follow-up to ensure sustained integration of professional development concepts (InPraxis Group Inc., 2006).

The professional development school (PDS) model, on the other hand, represents an evolution towards a more in-depth formation of a sustainable and collaborative learning community. Professional development schools are schools in which university faculty, teachers, and student teachers (from the university) work collaboratively to improve professional development for teachers and staff and enhance student teaching experiences. These goals are achieved through the university faculty's active engagement in the school, formal professional development experiences (in the form of workshops, coaching, consultation, and modeled skill practice), and school-based collaborative research (Reitzug, 2002). Reitzug (2002) cited Little (1994), who argued that issues, such as the complexity of current educational reforms including authentic teaching, fair assessment, curricular integration, and achievement of equity often do not lend themselves to simple skill training. Instead, successful professional development and effective enactment of teaching call for the creation of professional growth cultures in

schools where teachers are supported to function as intellectuals rather than as technicians; i.e., teachers are enabled, supported, and empowered to integrate their newly acquired knowledge and skills into their teaching. PDS work should also be collaborative, develop leadership, create a learning community, and eventually lead to systemic changes. These objectives are clearly aligned with the tenets of effective professional development described in the prior section.

It will also be useful to examine the other side of the coin, in regards to how teachers *respond* to professional development efforts. The next sections will introduce cognitive and motivational models as a lens through which to examine various factors that affect teachers' degree of program implementation.

Expert vs. Novice Paradigm

Novice-expert cognitive models of professional development describe a series of developmental stages in acquiring knowledge, from novice to competent to expert (e.g., Dreyfus & Dreyfus, 1986). Such models contribute towards our understanding of professional development as a progression of initially acquiring basic understanding of concepts (declarative knowledge) and then progressively learning more application and know-how (procedural knowledge) (Anderson, 1983; Anderson & Lebiere, 1998).

The expert-novice line of research has evolved from focusing on the concept of expertise in the area of problem-solving applicable in a wide range of domains (Newell & Simon, 1972) to studying professional development continua in specific professional disciplines, such as with doctors (Patel & Groen, 1991), nurses (Benner, 1984), and teachers (Borko & Livingston, 1989; Carter, Sabers, Cushing, Pinnegar, & Berliner, 1987). This line of research shows that novices move through a developmental progression towards expertise (Daley, 1999).

Cognitive psychologists utilize the expert vs. novice paradigm to study characteristics of expert cognition and performance with the stated intention of developing novices to be experts. In order to help novices move towards expertise in a given domain, they should be engaged in authentic tasks in a "legitimate peripheral participation" (Lave & Wenger, 1991, p. 27), a more peripheral, supportive role with close supervision and feedback, and then transition gradually into more independent roles (Collins, Brown, & Newman, 1989). According to Dreyfus' five-stage model of skill acquisition, novices demonstrate rigid adherence to rules and little discretionary judgment and need close monitoring with instructional feedback in order to progress along the novice-expert continuum (Dreyfus & Dreyfus, 1986).

Experts and novices vary greatly in their knowledge representation and problem solving. Reviewing differences between experts and novices, Chi, Glaser, and Farr (1988) pointed out that experts 1) have a greater amount of domain knowledge, 2) distinguish larger, more meaningful patterns in their field of expertise, 3) complete tasks and solve problems with faster speed and fewer errors, 4) have superior working and long-term memories (due to a capacity to "chunk" pieces of information and automation of basic skills, as well as to their better developed "schemas," which are more elaborate interconnected, detailed, and accessible), 5) conceptualize problems on a deeper structural level, 6) take more time to analyze a problem before attempting to solve it, and

7) have more powerful self-regulating skills that enable them to plan, monitor, and evaluate their progress more effectively.

This study utilizes the concept of the novice-expert continuum in order to classify teachers who exhibit various degrees of program implementation. For example, those who implement a program to a high degree can be considered "experts" of a particular educational reform, and those who implement to a low degree (or not at all) can be classified as "novices." The high implementing teachers in this study demonstrated many of these expert characteristics listed above, and an analysis of the interview data provides specific examples of these featured differences between "experts" and "novices" that will be examined in the Results section.

Teacher Motivation

Research in the field of cognitive psychology suggests that motivation and other affective factors impact both students *and* teachers, and play a significant role in learning (Alexander & Murphy, 1998; Hawley & Valli, 2000). As Butler (2007) wrote, school is an "achievement arena" not only for students but also for teachers, who presumably want to do well at their job but who may have different achievement goal orientations (Pintrich, 2000) and thus may differ in the ways they define success and in the goals they set for themselves and for their students. For example, students or teachers with a performance-goal orientation (Pintrich & Schunk, 2002) judge their own capabilities by comparing themselves with others. Consequently, they may assume they have low ability in an area in which they experience difficulty and may seek to avoid exposing their inadequate ability through "work avoidance" or by not seeking help from others. Thus, due to their perceptions of inferiority, they may be less motivated to seek assistance or take the risks that are necessary for learning and growing.

Danielson (2002) wrote: "(o)nly by understanding *how* people – both children and adults – learn, can educators hope to design instructional programs that maximize learning" (p. 22, italics added). One might also suggest that it is important to understand not only *how* but *why* children and adults choose to learn. Theories of motivation that focus on student learning abound in the literature (Bandura, 1986; Covington, 1992; Deci & Ryan, 2002; Lave & Wenger, 1991; Locke & Latham, 2002; Maslow, 1970; Skinner, 1953; Weiner, 1986; Wigfield & Eccles, 2002); however, there is limited research in the area of teacher motivation. Various authors have emphasized the importance of studying teacher motivation (Goldsmith & Schifter, 1997; Schifter & Fosnot, 1993; Shulman & Shulman, 2004) as highly motivated teachers are more likely to feel happier and stay in the profession longer, engage in educational reform, and more importantly, implement innovative programs to increase student learning (Jesus & Lens, 2005). Research studies that do examine teacher motivation often approach this construct by listing (rather than integrating) multiple theories (Ames & Ames, 1984; Butler, 2007; Hoy, 2008; Kocabas, 2009; Roth, Assor, Kanat-Maymon, & Kaplan, 2007; Smith & Gillespie, 2007). These models also fail to address teachers' motivation for gaining increasing understanding in a particular domain.

Researchers have called for a comprehensive and integrated theoretical model of teacher motivation to understand all aspects of teacher motivation and resulting behavior,

and to suggest possible intervention strategies for program implementation and professional development – the focus of this study. With a "theory-integration approach" (p. 121) Jesus and Lens (2005) set out "to harmonise the specificity and the complementary nature of the theories" (p. 121), i.e., to synthesize various theories of motivation in a global framework that more aptly addresses the complexities of teacher motivation and resulting behaviors. In particular, Jesus and Lens' integrated model (2005) outlines the relationship between teachers' motivation and their resulting professional engagement. Because this study focuses on how teachers' cognition and motivation affect their degree of program implementation, this model offers a fitting lens through which to explore the relationship between teachers' motivation and their degree of program implementation.

Jesus & Lens' integrated model of cognitive-motivational theories. Jesus and Lens' integrated model of cognitive-motivational theories (2005) attempts to coalesce the following concepts and theories into one unified model: 1) learned helplessness (Seligman, 1975), 2) motivational discrepancy theory (Jesus, 1995), 3) self-efficacy theory (Bandura, 1977), and 4) intrinsic motivation theory (Deci & Ryan, 2002). Figure 1 provides a visual representation of this integrated motivational framework. This model explains low teacher performance by integrating the various attribution and expectancy factors that play a major role in teachers' cognitive-motivational behavior.
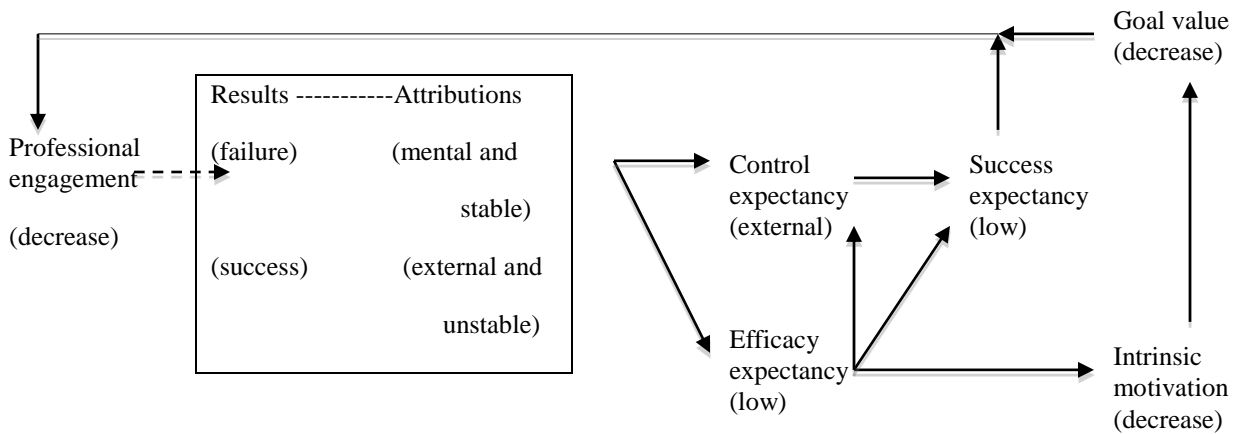

Figure 1. Integrated motivational framework.

First, the integration of Seligman's concept of learned helplessness highlights teachers' potential reactions to experiencing failure. If they attribute teaching difficulties to internal, stable, and uncontrollable factors (e.g., lack of teaching skills), they may come to believe that success cannot be achieved no matter what they do. In other words, they develop an expectancy of external control and believe that only external, uncontrollable, and unstable attributes (e.g., luck or a good day) can lead to success. Perceiving that outcomes are uncontrollable leads to learned helplessness and a low expectancy of success. Teachers may feel that no matter how hard they try, they will not be able to experience success for themselves and their students. Thus, in this state they

can easily become disillusioned and unmotivated. This pattern of thinking usually results in lower effort and decreased professional engagement.

The motivational discrepancy component of this model assumes that teachers' lack of motivation can be attributed to their low expectancy of attaining highly valued goals. This aspect represents an important addition to the integrated model of motivation because it presumes that teachers experience burnout only if they attach high value to a seemingly unattainable goal (e.g., improving their students' achievement levels). Low expectancy of attaining valued goals can thereby explain a teacher's lack of professional engagement and a low desire to implement educational interventions.

In their integrated model of motivation, Jesus and Lens (2005) derive teachers' self-efficacy from various attributions. Using Weiner's (1986) theory of causal attribution, they address how distinctive locus, stability, and responsibility differences in attributions influence teachers' self-efficacy. For instance, teachers who attribute internal, stable causes to teaching difficulties (e.g., poor understanding of a given educational intervention) will experience low expectancy of teaching efficacy. Bandura (1977) states that teachers' performance expectations are influenced by their efficacy beliefs; hence, teachers who do not consider themselves competent tend to have lower expectancy of positive student outcomes. Jesus and Lens (2005) state that expectancy of control over results and teacher self-efficacy influence success expectancy – an important factor related to the degree of program implementation. Teacher self-efficacy also influences whether a teacher is motivated intrinsically or extrinsically since a sense of competence increases a teacher's desire (intrinsic motivation) to be highly engaged in professional tasks and development, and this intrinsic motivation in turn makes teaching goals seem more valuable.

This comprehensive model can contribute to a better understanding of the various motivational factors that may influence teachers' implementation of a new educational program. According to the model's tenets, teachers who are disillusioned may reduce their stress level by lowering their level of professional effort, which in turn may feel more acceptable if they simultaneously attach a lower value to the new program that they are supposed to implement. For example, teachers who experience a heightened level of stress due to a low expectancy of success as well as a perceived low level of competence and teaching efficacy may be more critical of and less motivated to implement a given program.

Since this theoretical model does not include specific suggestions for improving practice, this article will attempt to address this gap by providing a series of practical guidelines to improve professional development efforts by addressing teachers' motivational needs.

Methodology

In order to set the stage for a fuller understanding of the present study, this section briefly describes the original intervention, delineates how a purposeful sample of project teachers was selected for participation in this qualitative study, outlines the research questions and procedures that guided this inquiry, and details the methods used to analyze

the collected data.

Technology-Rich Authentic Learning Environments (TRALE)

Walker and Yekovich (1999) designed the Technology-Rich Authentic Learning Environments (TRALE) project to increase young urban learners' educational achievement by providing opportunities for meaningful learning using authentic, problem-based activities in a technology-rich and socially-based environment. Each classroom assumed a unique authentic role (e.g. store, theater, newspaper publisher, post office, museum) within the larger school-based community (Walker & Yekovich, 1999), which provided meaningful purpose and real-life context within which to practice skills and acquire new knowledge. The authentic, goal-oriented activities were aligned with student learning standards and allowed for contextualized practice of important literacy, math, and technology skills. These activities also had a social communicative purpose (Purcell-Gates, Duke, & Martineau, 2007) for students (e.g., selling goods in the community store) and positively impacted children's motivation. Technology was integrated in the classrooms to facilitate task completion in various authentic activities (e.g., generating invitations for the theatrical performance) in order to support children's learning (e.g., editing one's writing) and to serve as an additional motivating factor for students. A more detailed description is provided by Cave, Yekovich, and Walker (2010).

Participants

Four teachers were selected for inclusion in this study according to a purposeful sampling technique that measured their degree of program implementation. The teachers were selected for participation based upon their scores on a "Degree of Implementation" (DOI) instrument (described below), in order to create a sample composed of both low and high performing teachers. According to the DOI instrument, two teachers were categorized as "high implementers" (HI), and two teachers were categorized as "low implementers" (LI).

In order to measure the effectiveness of professional development efforts, the program coordinators created the Degrees of Implementation (DOI) instrument to assess the degree to which the program had been integrated into the instructional practices of the participating teachers. Data from this instrument were supplemented by additional data from 1) calendars of events, cross-referenced against minutes of the weekly meetings and teacher journals in order to obtain an index of the level to which teachers accomplished their goals, 2) information about the teachers' level of involvement in the program as measured by teachers' attendance at weekly meetings, 3) the quality and quantity of journal entries, and 4) the program coordinator's journal entries that included anecdotal descriptions of teachers' daily implementation of the program.

Classifying teachers along this expert-novice continuum allowed for exploration of the cognitive and motivational factors that either enhanced or hindered teachers' program implementation. The results of the comparative analysis can point to recommendations regarding ways to better structure professional development programs in the future.

Procedures

This qualitative case study utilized semi-structured interviews to inquire into teachers' experiences with program implementation. The interview questions were geared towards developing an understanding of the cognitive and motivational factors that influenced teachers' degree of program implementation and involvement in professional development. The following research questions guided the development of the interview protocol:

1) How did teachers' conceptualization of the project affect the degree and quality of implementation? What were perceived to be the major factors that enhanced or hindered implementation?
    a. How did teachers' comprehension of program goals and activities affect the degree of implementation?
    b. How did teachers perceive that the program's goals and activities could be integrated into their own activities and aligned with standards? How did this degree of coherence affect their implementation?
    c. What factors affected teachers' motivation to adapt the program goals and activities in terms of comprehension, ease of integration, alignment with standards, as well as incentives and compensation?
    d. What did teachers perceive as the major challenges and obstacles that hindered full program implementation?

2) How can professional development programs be better structured to address what failed to work and to promote better development of instructional interventions?
    a. What are teachers' suggestions for improvement?
    b. What other incentives or supports would have been useful or motivating?

Analysis

Each interview was transcribed, analyzed, and subjected to rigorous recursive analysis in order to discern teachers' perceptions of the cognitive and motivational factors that helped or hindered their performance, as well as their suggestions regarding factors that could have improved program implementation. The interview data were analyzed based on the recommendations and procedures created by Bogdan and Biklen (1998) and Miles and Huberman (1984) using a coding system including a list of codes and subcodes for various units and categories of data. The analytic strategy for these multiple cases (i.e., four teachers) revolved around identifying issues within each case and then looking for common themes transcending the cases (Yin, 2003). As themes and categories began to emerge and coalesce, the initial coding system was further refined. The analysis of cases in this way allowed for a broader interpretation of the common themes and factors that helped or hindered program implementation, and illuminates recommendations for improving professional development efforts to better support teachers' cognitive and motivational needs.

Data from the document analysis together with observations and student interviews were used for triangulation purposes. In order to supplement the interview data, field notes were also collected about the impressions of the data collector and extra remarks before, during, and after the interview. The content of the field notes included the entire interview transcripts supplemented by the description of the site and a portrait of the interview participants.

Limitations

Due to the inherent nature of qualitative research, the generalizability of results is sometimes seen as more limited because of the focus upon the experiences of a small group of individuals or upon a single context. However, it is important to recognize that the "transferability" is determined not by these researchers but by those who may apply the findings (Lincoln & Guba, 1985) – whether to inform future research studies or to utilize the recommendations as a foundation for improving professional development practice.

Results

The analysis of the interviews revealed a central dynamic and interactive relationship between cognitive and motivational factors – wherein the degree of teachers' cognitive understanding of the project influenced their degree of motivation to adapt the program. More specifically, teachers' cognitive understanding (or lack thereof!) of the *whats*, the *hows*, and *why*s of the program greatly influenced their capacity as well as their motivation to implement the intervention. In addition to cognitive factors, other intrinsic and extrinsic motivational factors affected the degree of implementation. All of these influences are discussed in more detail below, along with a delineation of teachers' suggestions for improving professional development efforts. In the Discussion section, these suggestions for improving practice are expanded upon and tied back to the research literature.

Expert vs. Novice Paradigm

Results from the data analysis of high and low implementers revealed numerous examples of expert-novice thinking, which are presented and explicated below.

Well-organized knowledge representation. Analysis of the high implementer interview data revealed numerous examples showing that they had achieved a well-organized knowledge representation of the program's key tenets. For example, one high implementer noted the following:

> I understood right at the beginning what I was supposed to do and what the expectations were…there's always more clarification, but it always seems to make sense that…this is all your curriculum, your community was supposed to be your whole classroom (HI #2)…

This was in contrast to the low implementers, who took much longer to grasp the key concepts and thus became less and less motivated to implement the program (a resulting effect on their motivation, which is discussed in more depth in the motivation section of the analysis). For example, one high implementer noted that some of the lower implementing teachers did not sufficiently comprehend the purpose of the program and how it aligned with standards:

> Some people just didn't know what was being asked of them, how it's supposed to fit in. (HI #2)

The high implementing teachers, in contrast, had formed an elaborate schematic understanding of how to integrate the new program into their instruction and how to tie the program's goals to learning standards. One teacher whose classroom role was a theater noted the following:

> I decided to…take the theater and try to form everything around it as much as you could, you know, just try to fit in all the language activities and try to fit in math. (HI #2)

High implementers also spent time initially trying to understand and analyze the project in order to develop a sense of the value it could bring to increasing student achievement. When one high implementer was asked whether her understanding of the project had changed dramatically since the beginning of the program, she responded that:

> There's more understanding now and the effect it can have, you know the positive… at first, I wasn't sure where it was going to turn up and what the kids were really getting out of it, but that knowledge is increasing. (HI #1)

These expert teachers could conceptualize the learning environment on a deeper level and planned their lessons accordingly; i.e., they selected activities only when they were meaningful, standards-based, and instructional rather than superficially appealing. They were faster at creating community events and had a larger repertoire of instructional methodology appropriate for authentic learning. High implementers were able to manage the flow of students with more ease, which allowed them more capacity to focus on student learning and behavior. They also had highly automated computer skills that allowed them to give their students more autonomy in their learning and handling computers. One high implementer noted how students were able to become more independent and help each *other* learn:

> Once the students learned new skills, it was amazing to watch them. I just had them teach other children. I got to the point where I would teach something to the whole class, and if they asked me again about the same thing, I wouldn't help them if they raised their hands… I'd find someone else [another student] in the classroom who knew how to do it. (HI #1)

A low implementing teacher shared that she needed to take the time to do the work consistently in order to build her comprehension and her ability to integrate the skills into her classroom:

> It's just my unwillingness to…not really unwillingness…not really difficulty, if you just, you know, if you just took the time to do it consistently every day, but it's hard to do that… I would actually have to teach it to them, and that's a lot of work. It's a lot of work. (LI #1)

Trial and error and learning over time. High implementers acknowledged that their deeper and more intuitive understanding grew over time and emerged from experience, practice, and their willingness to endure a "trial and error" period of making mistakes and learning from them. High implementers were willing and able to experiment and learn from their own mistakes and experiences. They expected and accepted that first they would feel unsure of themselves, but as time passed, they would gain more proficiency. This sentiment did not impact their self-efficacy negatively, so they were not threatened to ask questions and try new things. They were comfortable with the idea of making mistakes and not achieving perfection immediately. Through trial and error they were able to refine their understanding and become more familiar with expectations from the project staff, school system, and principal. The high implementers displayed more expert-like planning when aligning authentic activities with standards and were more comfortable to give their students more autonomy in their learning. For example, one high implementer noted that:

> Last year…just going through, you pick up things that "Oh I could have done that. Oh that would've worked too. Oh, this just failed miserably." I mean, you really have to experience it to start understanding, this worked, this didn't work, you know, "I could've done this differently, next time I'll do this, this is something I'll keep because it worked really well and the kids liked it." This year has been a lot smoother on the computer…it just flowed, you know, naturally like "Oh yeah, go do that." I don't even have to look at them anymore. (HI #2)

One of the low implementers who experienced difficulty comprehending the various components of the project shared that it took her a long time to conceptualize the role her museum was supposed to play in the community, which certainly affected her degree of implementation:

> It took me… well, I started in September, but I think it wasn't till around January, February till I really actually understood what was going on, what I was actually supposed to do. (LI #1)

Because the integration of the museum activities with the standards seemed confusing and challenging, this teacher could not see the overall framework and experienced difficulty in creating a vision to guide her efforts. She was unsure of herself, in comparison to the other teachers, so eventually, due to the conceptual difficulties and

lessened teacher self-efficacy, her motivation for active engagement decreased. She also confessed to being envious of the other teachers who had understood the program and had successfully operating microcommunities in their classes. She did not ask for help from other teachers or the program coordinator to help hone her understanding. Consequently, this low implementing teacher procrastinated program activities with her students and gradually isolated herself from the community of practice (i.e., she arranged fewer visits to other teachers' classrooms).

Teachers' conceptualization of novice-expert continuum. Teachers reported differences in the level of program implementation across the classrooms in terms of the teachers' relative degrees of comprehension. The high implementers believed that the low implementers may have been able to get on board with program implementation if the program coordinator had set up all activities in their classrooms initially. If the activities had been designed and the classrooms had been set up for their role in the community, the lower implementers would have understood the essence of the program and been able to continue implementation when scaffolded (Vygotsky, 1978):

> I was just like "I don't think [lower implementers] have understood what they're doing and what the community roles are." It's so far apart, it's almost like they're not in [the program]. I know for a fact that some people don't understand the learning communities. How it's supposed to actually work. Some… you can just see the light click on in some people's heads towards the end of the school year and say "Oh, that's how we were supposed to do it? Oh." … and I'm thinking "Where were you before? Why didn't it click in your head?" Granted, I know that everyone is not on the same level, but… I don't even know how it could've been explained better. (HI #2)

This high implementing teacher suggested that the program coordinator could have helped scaffold teachers' understanding by setting up more curriculum help and encouraging the low implementers to make the connection between the program and their own classroom goals. For example, she suggested:

> "I'll set up all your activities around the first play, so you can understand how to do it." I mean, some people needed that. They needed it spelled out. (HI #2)

However, high implementers also pointed out that there are limits of how far and fast a program coordinator can push low implementing teachers, so a balance has to be achieved between "sounding too pushy" or "pounding [new program] in someone's head" and encouraging teachers. According to one high implementer:

> Suggestions were made [to the low implementers], and they weren't even looked at, "I don't wanna do that." And you can't force something on someone else, it has to be your own thought process: "How can I make this work in my classroom?" (HI # 2)

For the low implementer who admitted that it was difficult to understand what she was "actually supposed to do," she suggested that it would have helped scaffold her understanding if she had been able to learn from observing a fellow teacher:

> …(if I could) go to another teacher's classroom who had an African Museum… I'm a 'see person' first – it's hard for me to see it in my head. I had nothing to fall back on… I don't have anybody that's been where I'm trying to go or has done what I'm trying to do. I need to visualize things… I need to see it. (LI #1)

Indeed, in order to be successful, novices have a need for competence, autonomy, relatedness (Deci & Ryan, 2002) as well as a sense of significance, power, (Coopersmith, 1967), and choice (Kohn, 1993). With appropriate scaffolding, monitoring, and explanations, teachers can be guided towards expertise. Low implementing teachers can feel competent when appropriate scaffolding is provided, however, they also need to take the initiative to be autonomous and active participants to feel empowered, significant, and contributing members of the community:

> … you need to go back to the basics and talk about it. You know, "What is your community doing? What are your activities?"… You have to really start to focus in on that, and then balloon out. (HI #1)

Because the low implementing teachers did not feel competent, they tried to control the students by exerting more control than necessary:

> I wasn't comfortable just opening up the center and just letting them to it and was like I had to be in control and I felt like I had to be able to sit there and monitor them. (LI #2)

Taking the initiative to actively participate in program implementation is closely related to the degree teachers feel motivated. The following section of the data analysis explores the motivational variables that teachers identified as affecting their degree of program implementation.

Motivational Factors

In reflecting upon "what worked", teachers tended to stress the inherent motivational aspects of the authentic learning communities (including the program's focus on students' collaboration and contextualized skill practice). They also emphasized the following suggestions that would bolster their motivation to implement the program: clear and consistent feedback from program staff, opportunities to demonstrate what they have done well (public recognition, peer coaching, presenting at conferences), and financial remuneration.

Inherently motivating aspects of the program: Improving student learning, behavior, and self-esteem. Recognizing the value of a particular educational intervention (in terms of its positive effect upon students' learning and the classroom environment) is a powerful, intrinsically motivating reason for teachers to implement a program. Because the students in the project classes enjoyed working and learning together, they helped each other without prompting, and most of them became more self-reliant. When students become independent learners, teachers have fewer challenges with classroom management and meeting diverse students' needs. In the project classrooms, peer coaching became the norm, and time on task increased. Contributing to the classroom role was so motivating for the students that they were more willing to focus their attention on skill practice that is not in itself inherently interesting or fulfilling:

> If they see that this is like the real world, it just sinks in, and then they try to work for it more. (HI #1)

The social nature of the tasks and the activities that were embedded in interactions among the students and across the classes provided an impetus for even the struggling students to get involved in their assigned roles in their microcommunities. The teachers saw how the program's intrinsically motivating tasks could help motivate their students to achieve greater academic success and could be relevant to their future career and life development. These two realizations became salient motivating factors in the teachers' desire to implement the program. Some examples are listed below:

> If they're reading, they're going to be better writers, and they're going to be better employees… (HI #1)

> …in the store they benefit from learning about money. (HI # 2)

> … [working] teaches them responsibility because [students] have to understand and complete their jobs… (HI #1)

> We did the "Rainbow People" in the theater, which was about accepting others as they are, regardless of color. I incorporated color words and got into social studies of how to accept other people. (HI #2)

The opportunity to bolster students' self-esteem and excitement about learning also appealed to teachers:

> I think that they need good self-esteem at a young age, and this really gives it to them, they feel motivated about their part: "I have a part in the play, look at me"… and they get motivated by it: "Other people are gonna see me, and I'm gonna look smart." And that's important at a young age…to think that "I'm important, I have an important part in this because of my role." (HI #2)

> [It's] another way to teach the skill that isn't through workbooks and dittos, and they might get excited about it. (HI #1)

The realization that the program could help address behavior issues in the classroom also became an important motivating factor for the teachers:

> As time went on, I realized it's not only motivational but if I set it up like it's a real job, like the real world, that it might have more effect on those that are real troublesome…if they see this is like the real world… it sinks in, and then they try to work for it more. (HI #1)

> **Attributions, expectancies, and values.** As we can see from the above examples, effective teachers were motivated to implement the program because it helped them achieve some of their valued goals, such as increasing their students' intrinsic motivation, improving student learning and self-esteem, or addressing behavior issues. When high implementers became professionally engaged in the project and experienced success, they attributed their students' learning to their own lesson planning, program understanding, and professional effort. The teachers' internal control expectancy and efficacy expectancy increased; i.e., they came to believe that student learning was within their control and improvement was due to their teaching abilities. On the contrary, the low implementing teachers experienced several setbacks. Though both low implementers were enthusiastic about the program initially, they soon felt overwhelmed by the tasks involved in setting up and running their microcommunities:

> I didn't know what questions to ask in order to get the program moving, and I didn't know what was expected of me from this program. (LI #1)

One of the low implementers even confessed that she could not 'compete' with her colleagues who had their communities set up within a short time:

> I was kind of real scared about having people come down and thinking my kids wouldn't respond appropriately or they would come back and say: "you know, they didn't do anything" based on some of the things that the other teachers did. (LI #1)

From the low implementing teachers' comments it was clear that they felt helpless, hopeless, and overwhelmed in their classes:

> I can't get going. I don't know what to do. I have all these ideas, and I can't get them expressed unless I have the [program coordinator] come in. (LI #2)

When teachers attribute their difficulties to their lack of skills, they can soon feel that no matter how hard they try, they cannot achieve success. This expectancy of external control (believing that an external factor, such as luck, is the only factor that can lead to success) may result in low expectancy of success:

I didn't know the computer, …, it bothered me because I had to … ask other people and that interrupted their classes…, so I was disenchanted about that. (LI #2)

It is easy in this state to become disillusioned and unmotivated. Project staff observed that the low implementers' effort and engagement in the project progressively decreased. Eventually, these teachers placed less and less focus on the program and began to consider it as a supplemental activity for the end of the day or week if time permitted it. One high implementer commented:

It's not a little activity that's for half an hour a day… some people just, "Oh, well, that's my social studies. I'll fit this in when I have time on Friday."

This tendency seemed to indicate that the low implementing teachers' initial enthusiasm for the program lessened, and they attached lower value to the original goal. For example, the video store teacher allowed her students to use the computer very rarely though the children kept asking:

If a student used the computer on Mondays, maybe it would be a couple of Mondays before the same child got the chance again. (LI #2)

The same teacher appeared not to totally understand the concept and value of authentic learning environments. She did think that the video store was a great experience for her children, so they could see how the real world operates. However, she did not make the connection that this learning environment could be used for meaningful literacy activities for her students:

Some children didn't learn to read the covers, but to me, it wasn't important how well they knew how to read the cover, it was "Did they know the process, moving from checkout to paying the money?" (LI #2)

In effect, the teachers who had a poor understanding of the program eventually developed a low expectancy of teaching efficacy and expectancy of positive student outcomes. These two teachers' efficacy lowered and decreased their intrinsic motivation. Low implementing teachers also tended to complain about their students' low level of academic achievement more often than their successful counterparts. It seemed that the lower implementers tended to find external variables (students' low skills upon entering their classes, low project support, unreasonable expectations from principal and school district, and limited time) to explain their lack of progress in the project.

At times, however, all teachers mentioned some external motivating factors that would have helped program implementation, which will be described below. These factors included financial incentives, time to plan, public recognition, personal attention, opportunities to demonstrate their expertise, and appreciation for their hard work.

Teachers' Suggestions for Improving Motivation

Teachers shared candidly that working in the project took an enormous amount of time and required them to stay after school until late hours. Some teachers suggested that having additional planning time during the day would have been a great incentive to increase program implementation and teacher participation:

> It's just a lot of work for one thing… and sometimes I think… is it worth it? Is what I'm doing really worth it? For the amount of work that's expected from me?... It's stress on me, that's stress on my kids…You know, what benefits…it shouldn't be what I'm getting out of it, it should be the kids. But you have to have some incentive to go on. (HI #2)

She returned to this same sentiment later in the interview:

> There's enough stresses and pressure… you have to do all this other stuff for the school district. Then to be asked to put all this other things on top of that and not to be rewarded, it's hard. It's really hard to say "Yeah I'm coming back in and fully implement it 100% next year even though I know I have 15 other things that I have to accomplish, but sure I'll do it!" That's a hard thing. (HI #2)

The teachers also admitted that incentives in many forms (monetary and recognition) would have been much appreciated among participating teachers:

> I tell you honestly money is an incentive. I mean, to think that "OK, I'm putting in all this extra energy in working on something"... I'm like "Yeah, I want supplies, but I want to be rewarded in other ways." … Yeah, supplies are helpful, and I never turn them down, but knowing that other teachers in the building are getting the same things as I am…and they're not working as hard…you know, why should I keep doing it? What's my reward for doing this? (HI #1)

Public recognition and a chance to teach others would have motivated teachers more. High implementers wanted to get published and share what they had learned by presenting at conferences:

> To be able to go to California and explain… to show what I've done. To get some recognition whether it be monetary or some published thing that had my name…if I knew that I've got to go somewhere and present what I'm doing, that would be a big incentive. (HI #2)

Another high implementing teacher wanted to be a peer teacher for low implementers in order to help them master the skills and improve their degree of program implementation:

> … let us be the teacher for other teachers. (HI #1)

Teachers also suggested that receiving more attention and recognition from the program directors would be a motivating factor. Teachers wanted the principal investigators to be present at the school much more often and spend more time in their classrooms observing and helping with student learning. The teachers also wanted to be singled out in their own community as hard working program implementers:

> When you don't see people regularly, or they pop in and pop out… I'm thinking to myself, "Do you really care? Is this really an important thing to you? I know, you're probably doing papers about it, but you're forgetting the people who're doing it for you." (LI #2)

One of the low implementing teachers also shared that she would have enjoyed more recognition and feeling more unique as a member of the project:

> I enjoyed the program better last year. I guess because last year was just a small group of us, and we became pretty much like a family, and then all these other people came in, and we're not as close as we were last year… We don't get the attention that they gave us before…I need somebody who likes what I'm doing… they would just come in, and they would see you work, and they would say "Wow, what a good job you did" and pat you on the back, and make you feel good that somebody really appreciates all that effort. (LI #1)

Discussion

This study aimed at achieving a qualitative understanding of the cognitive and motivational factors that either helped or hindered teachers' implementation of an early childhood intervention program. Analysis of the findings revealed that the low implementing teachers found it challenging to obtain a deep understanding of the program's overall goals and founding principles. It was even more challenging for them to create learning activities that were based on the program's principles and at the same time were aligned with the students' learning standards. The low implementing teachers designed many of their activities based on their appeal with no reference to the standards. Even if a few activities were designed successfully, they did not form an integrated whole, and the message about the purpose of those activities and their real-life applications were not communicated to the students.

On the other hand, the high implementing teachers constructed elaborate schema of the project and refined their understanding as the result of constant feedback from the program directors, the facilitator, and the successes of the activities with children. These exemplary teachers were also able to give a very detailed description of how they integrated the standards into their instruction.

Besides conceptual understanding, there were other relevant factors that played a major role in the degree of program implementation. Teachers shared that additional planning periods, clear and consistent feedback from program staff, financial incentives, further support from the school system, financial compensation, and other forms of

appreciation would have increased their motivation to implement the program to a greater degree.

Suggestions for Future Program Implementation

The school's context is integral to promoting effective, locally situated professional development. Time, resources, leadership, collaboration, focused goals, and support structures are necessary to foster effective and sustained program implementation (Killion, 1999). Based on the teacher interviews that revealed the cognitive and motivational factors that helped or hindered implementation, the following recommendations may prove to be instrumental in engaging teachers in improved professional development and implementation of educational reform programs.

I.   Scaffold teachers' comprehension of a given program.
   a. Improve teachers' cognitive understanding of the essence and goals of the new program and the means to achieve those goals. Clearly and repeatedly state the purpose of the program and make program goals relevant and motivating to teachers.
   b. Discuss research evidence and theoretical principles that underpin the program. Provide overview of central features of the project. Discuss with the teachers how the components of the project fit together and how they are long-term motivating factors.
   c. Prepare a Teachers' Guide (Guthrie et al., 2004) that outlines major principles of the program and gives suggested lessons and strategies for instruction. Teachers can freely adapt these ideas and activities to their own unique classrooms. Include resources with daily lessons designed to meet instructional goals while integrating standards.
   d. Allow for continued ongoing learning and on-the-job support, where you emphasize the development and refinement of both declarative and procedural knowledge (Anderson, 1983).
   e. Provide opportunities for peer teaching and training. Ask each teacher to generate and share examples of lessons from her own classroom. Have high implementers peer coach. Teachers-in-training learn well from exemplary teachers who present model lessons and accompanying student work. Teachers can also watch videos of other teachers at the same grade level who model lessons (Guthrie, 2004). Research has demonstrated that teachers learn best from other teachers (Dede, 2006).
II. Provide continuing support in order to increase teachers' comprehension and motivation.
   a. Provide more consistent and constant support throughout the year that is more closely related to a day-to-day tool to use in classroom. Point out what worked and did not work in the past. Demonstrate activities that fit teachers' interest and skills. Scaffold initial implementation of program components. Have ideas for follow-up activities (in this case, activities for students following visits to other microcomunities).

    b. Model the use of each strategy for teachers and have them present their own lessons to enable teachers with beginning understandings to practice planning and implementing lessons that incorporate the major tenets and principles of the program.

    c. Design instructional environments around collaborative problem solving and cooperative learning.

    d. Make arrangements for teachers to have sufficient time for planning lessons individually, on grade level, and across grades.

    e. Explain what the specific expectations are for program implementation.

    f. Clarify who is responsible for which task and what the deadlines are on a calendar.

    g. Provide adequate monitoring and specific and timely feedback. As with any new program, teachers must receive ongoing and effective support to understand, conceptualize, and carry out the program's goals. Give teachers frequent feedback and coaching from program facilitators or investigators throughout the duration of the program's implementation. A central principle is constant monitoring of participants' understanding of practice in question in order to realize issues that need to be addressed. Monitoring of understanding can involve formal and informal assessment as well as informal means of obtaining feedback (Dall'Alba & Sandberg, 2006).

    h. Design and share with teachers an evaluation form, degree of program implementation instrument, or assessment guidelines that the project team uses.

    i. Create opportunities for critical reflection and exchange of ideas centering on discovering or creating solutions and alternatives with others. Enhancing one's understanding through guided reflective dialogues about practice and gaining exposure to others' understandings and enactments of teaching are central to refining knowledge (Ball & Cohen, 1999). Focused dialogue can bring about such reflection (Dall'Alba & Sandberg, 2006).

    j. Provide structure. Create timelines for implementation with teachers and schedule follow-up meetings with clearly set goals and activities to avoid procrastination.

    k. Hold regular teacher seminars to exchange successes and challenges, progress and obstacles, ideas and techniques (Guthrie, 2004). Make sure the meetings focus on exchanging ideas and do not turn into gripe sessions. Weekly or biweekly meetings should be structured and focus on what goals were achieved and what new goals can be planned.

    l. Document teachers' and students' progress using various means, e.g., videotape lessons, performances, and community events.

    m. If technology is involved, provide logistical support for set up and maintenance and replace old equipment, such as headphones, computers, software, and printers.

III. Build teachers' motivation to implement program to a high degree by emphasizing intrinsically *and* extrinsically motivating factors.

    a. Provide incentives, such as financial remuneration, not only supplies.

b. Show teachers appreciation, recognition, and attention for their efforts.
c. Allow high implementing teachers to demonstrate their mastery by becoming peer trainers, presenting at conferences, and/or being involved in publishing efforts.

Conclusion

This study aimed at achieving a qualitative understanding of the cognitive and motivational factors that either helped or hindered teachers' implementation of an early childhood intervention program. Analysis of the findings revealed that teachers' conceptual understanding of the program played a major role in supporting their implementation efforts. Teachers also shared that other relevant factors, such as support from the school in the form of additional planning periods, financial incentives for participation in the study, opportunities for public recognition (e.g., opportunities to present, publish, or be mentors for other teachers), and consistent and supportive feedback would have increased teachers' involvement in the program. This deeper understanding of the cognitive and motivational issues that helped or hindered teachers' program implementation led to a set of recommendations to improve professional development endeavors. These recommendations align with tenets outlined in cognitive and motivational theories, and represent an important addition to the literature because they draw upon teachers' own perspectives of the cognitive and motivational issues that help or hinder professional development efforts.

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