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THE EFFECT OF SUSTAINED PRINCIPAL DEVELOPMENT

ON THE DEVELOPMENT AND MAINTENANCE

OF COLLABORATIVE ACTIVITIES IN SCHOOLS

by

Sarah Westerberg

A dissertation presented to the

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ABSTRACT

THE EFFECT OF SUSTAINED PRINCIPAL DEVELOPMENT

ON THE DEVELOPMENT AND MAINTENANCE

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Sarah Westerberg

Department of Educational Leadership and Foundations

Doctor of Philosophy

This study examined the effect of sustained principal development through membership in the BYU Principals Academy on collaborative activities and teamwork in schools. Principals who participated in the BYU Principals Academy received preparation and training to assist in the development and maintenance of professional learning communities in their schools.

A 39-item online survey that focused on attitudes and experiences with teamwork and collaboration was disseminated to 12 teachers at each school where the principal was a member of the Principals Academy and where e-mail addresses were available. In addition, a control group of teachers from schools where the principal had no prior exposure to the academy also received the survey. Different cohorts were created depending on the year when principals joined the academy, ranging from 2002 to 2006. Exploratory factor analysis and confirmatory factor analysis were used to investigate the dimensionality of the survey variables. The resulting variables were analyzed using a

one-way ANOVA test followed by Fisher's post-hoc test. Open response data was subjected to themes-based content analysis.

The factor analysis revealed several variables. Once these factors were analyzed further, significant differences for the derived variable *Experiences with Teamwork* were located between the 2002 and the 2003 cohorts and between the control group and four of the five cohorts. Content analysis of data generated by the open-ended questions revealed mixed experiences with teamwork and collaboration. Teachers reported either exclusively positive or negative experiences with teamwork and collaboration and teaming were most often connected to the every day tasks linked to teacher survival rather than student learning and assessment.

Some differences in variables between the 2002 cohort and the 2003 cohort may be attributed to the unique composition of these cohorts. In the 2003 cohort, several teachers were from the Carbon School District, and in the 2002 cohort several teachers were from schools where the principal was a member of the Principals Academy steering committee. Differences between the 2002 cohort and the control group may be attributed to the longevity of exposure to professional learning community principles and ideas in the 2002 cohort and a lack of this knowledge in the control group. A follow-up study could concentrate on focused interviews of principals in the 2002 cohort to investigate how this cohort may be different from the other cohorts.

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Six years ago when I began the doctoral program, I never imagined it would take this long to finish. Taking the classes was by far the easy part of the requirements for this program. Conducting original research and writing a dissertation has proved to be a veritable refiner's fire for me. An experience that, although arduous and seemingly never ending at times, has enriched my life in many different ways and offered an educational journey I have enjoyed immensely. There are many who played different roles in the realization of my doctoral dream, providing help and support along the way, who I wish thank at this time.

My parents always stressed the great importance of education. They constantly encouraged each of their five children to get as much education as possible. I dearly wish my mother had lived to see the day when three of us received doctoral degrees. I am grateful to all of my family for their constant encouragement and support.

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CHAPTER ONE

INTRODUCTION

Professional learning communities in educational settings have been hailed by
many educators as the way for school reform. Scholars from across the nation and
internationally have documented the theory, development, and growth of the professional
learning community movement during the last ten years as well as the role of the
principal in this process (DuFour & Eaker, 1998; Hord, 1997; Huffman & Hipp, 2003).

Those who have studied professional learning communities thus far tend to have
focused on items such as the presence or absence of a professional learning community
(Hord, 1997) or the developmental stages of professional learning communities
(E.P.L.C., 2005). The nature of their approach has been largely anecdotal, through case
studies (Senge, 2000) or theoretical, in which the research positions professional learning
communities as the most appropriate vehicle for educational reform because they lead to
the improvement of student learning. With the notable exception of Bryk and
Schneider's (2002) exploration of trust in Chicago schools, the growing volume of
research in this area has rarely involved in-depth analysis of the different characteristics
of professional learning communities in schools. In addition, and most importantly for
this study, the effect of sustained training of school principals on the development of
teamwork and collaborative activities through professional learning communities in
schools has yet to be studied.

Leonard and Leonard (2003) conducted an interpretative study of professional
learning communities that relied heavily on interviews and dialogue with teachers and

administrators. They noted the critical nature of collaborative cultures in schools with professional learning communities, and concluded that "the realization and maintenance of schools as so-called 'professional learning communities' seems to remain, in many instances, little more than an elusive aspiration" (p. 9). The authors suggest that further research is needed to address what they describe as "the ongoing collaborative challenge" (p. 10) for educators.

This study will answer the call for further research in professional learning communities by studying what effect the preparation and training of principals has on collaboration and teamwork through professional learning communities in schools. Specifically, this study will employ a focused experimental design in order to analyze the effect of successive years of principal development through the Brigham Young University (BYU) Principals Academy. Further, this study will challenge the conclusions concerning collaboration and teamwork by scholars such as Hord (1997) and her work with the North Central Regional Educational Laboratory and tends to confirm, in part, Leonard and Leonard's concern that professional learning communities in schools remain "little more than an elusive aspiration" (p. 9).

<center>Professional Learning Communities and Educational Reform</center>

While educators may be described as having in common the goal of educating students, how that goal is achieved has been the source of almost continuous debate (LaFee, 2003). However, in recent years, professional learning communities have been acknowledged as playing a crucial role in the transformation of schools (Fullan, 2000). In the current era of almost constant educational reform, many have attempted to make professional learning communities a reality in their own school environments. In some

cases, professional learning communities are promoted as a district-wide reform initiative, while in others, professional learning communities appear to be an isolated phenomenon, dependent on the efforts of individual school administrators, coupled with buy-in from teachers (Fullan, 2000; Leonard & Leonard, 2003). For professional learning communities to function effectively, the whole school staff, faculty and students must be enveloped by and participate in the collaborative environment.

Ideally, educational reform leads to educational renewal, thus the ongoing professional development of educators is central to the renewal of schools (Smith & Fenstermacher, 1999). This potential for school renewal through professional learning communities to meet the goals of educational reform was highlighted by Smith and Fenstermacher (1999):

> If the education profession is to flourish and if schools are to be a vital force in society, it is necessary to rebuild the school into a lifelong learning laboratory not only for children but for teachers as well. (p. 173)

Although the main purpose of professional development programs are to "add value" to educators, they also educate teachers about the requirements of various reform initiatives.

Elements of Professional Learning Communities

There is remarkable agreement and consistency among researchers as to the essential elements or characteristics of professional learning communities, though terminology or number of attributes may differ from study to study. Senge (2000) listed nine items in learning communities: reflective dialogue, unity of purpose, collective focus on student learning, collaboration and norms of sharing, openness to improvement,

deprivatization of practice and critical review, trust and respect, renewal of community and supportive and knowledgeable leadership. (p.15)

DuFour and Eaker (1998) identified six critical characteristics of professional learning communities: shared mission, vision, and values, collective inquiry, collaborative teams, action orientation and experimentation, continuous improvement and results orientation (p. 25-28). Despite differences in wording among the lists, trust, respect, collaboration, teamwork, caring, and shared vision appear to be recurring characteristics recognized by most researchers as they have studied real professional learning communities operating in different school environments across the globe.

Teamwork and collaboration have been identified by several scholars as key to successful professional learning communities. Matthews and colleagues (2006) recognized "teaming that is collaborative" as one of ten elements of professional learning communities. This type of teaming is concerned primarily with the improvement of teaching, learning and assessment. Presumably, teaming that is collaborative is also effective. Because many teachers consider their craft to be individual and competitive, they resist collaborative teamwork (Shiman, Culver, & Liberman, 1974), opting instead for superficial teaming or pseudo-teaming (ineffective teaming where individuals go through the motions of teaming without achieving desired results), which rarely brings about the desired educational renewal.

Collaborative Practices and Teaming in Schools

Collaboration and teamwork are vital aspects of professional learning communities in schools and are also considered central to many educational reform initiatives. Although collaborative activities may be viewed by many researchers and

school administrators as the best practices in education, they go against the traditional notion that teaching is highly individualistic, what Lortie described as the *cellular classroom*. This notion of the teacher working alone is often attractive to those seeking entry to the profession (Lortie, 1975). Because the life and work of teachers is often perceived as an individual, private activity, it has been difficult to counter the prevailing tide of isolation and "balkanization" (a situation where separate small sub-groups of teachers are formed, sometimes competing rather than working on a whole school basis). Balkanization may lead to poor communication and indifference that teachers experience in the classroom (Fullan & Hargreaves, 1996). However, the persistent isolation of teachers poses a formidable barrier to professional growth (Lortie, 1975). In theory, schools that have professional learning communities will only progress after the educators involved recognize the need for collaboration and teaming in order to achieve the common goal of improving learning for all students (DuFour, 2004).

Use of Collaborative Practices in Schools

Fullan and Hargreaves (1996) indicated that "collaborative cultures are complex and take time to develop" (p. 62). As a result, many schools settle for collaboration that is "superficial, partial or even counterproductive" (Fullan & Hargreaves, 1996, p. 62). Teachers may be involved in a variety of superficially collaborative, yet often disjointed, activities as part of their regular work. For instance, they may engage in partial teamwork and collaboration in faculty meetings, materials sharing sessions, committee meetings, and departmental/subject meetings (Leonard & Leonard, 2003).

Because teaching is widely viewed as an isolated, private activity, the need exists for an increased focus on collaboration and teamwork in schools. On a larger scale,

Fullan (2000) noted that while educators know about individual school success, they know much less about school system success as a result of increased collaboration.

The Value of Studying Professional Learning Communities

A growing body of research on professional learning communities has sought to demonstrate the value of professional learning communities in K-12 education by establishing first, whether or not a professional learning community exists in a particular school and second, by examining how well established that professional learning community actually is (Hord, 1997). Another popular approach has been via case studies, which relate the details of a real life school as a professional learning community. For example, the Effective Professional Learning Communities Project in England is a collaborative research effort between the Universities of Bristol and Bath. This study created detailed case studies of 16 different types of schools that had professional learning communities, and examined links between the characteristics of professional learning communities and pupil progress (E.P.L.C., 2005). While such research has helped to build momentum and credibility for the professional learning community movement in education, it has done little to aid understanding of how sustained preparation of principals affects the different characteristics of professional learning communities, especially teaming and collaboration, in practice. Thus, one of the most valuable directions for research in this area lies in the study of principals' preparation and its effect on the individual characteristics of professional learning communities in their schools.

Bryk and Schneider (2002) offered a detailed account of trust in inner-city schools in Chicago, but since their study was carried out to meet different ends, they only tie their

research indirectly to professional learning communities. Leonard and Leonard (2003) completed the most focused research to date on the collaborative activities of teachers in schools with professional learning communities. Their study used a qualitative design in which they interviewed Louisiana teachers about collaboration, and then examined the attitudes the teachers expressed.

While the existing research on professional learning communities is constantly expanding, a clear pattern has emerged as researchers have studied professional learning community characteristics in isolation and have neglected to compare data and observations from professional learning community environments at different stages of development with information gathered from non-professional learning community environments. In other words, previous studies of professional learning communities have asked participants whether or not teaming was occurring in their schools (Leonard & Leonard, 2003), but omitted contrasting the data with a control group. Through asking questions about attitudes and experiences towards teaming and collaboration taking place in schools, it is possible to understand better the benefits of sustained principal training and of professional learning communities in educational settings. By going one step further to devise a research study which allows the analysis of the teamwork and collaborative activities of educators in schools where the principal has been exposed to a particular type of preparation through the BYU Principals Academy, the results of such a project have the potential to shed further light on an oft, but only partly, studied phenomenon.

Background of the BYU Principals Academy

The Principals Academy at Brigham Young University (BYU) is central to this research study because membership in the Academy is the factor used to determine whether a particular school principal has been or is currently involved in sustained preparation. In order to understand the scope and purpose of the training provided through the Principals Academy at BYU and how the academy facilitates and supports the creation and growth of collaborative cultures through professional learning communities, a brief description is included below.

The Principals Academy at Brigham Young University, established in 2002, is still in its infancy. Previously, a Principals Academy had been coordinated and funded by the State Office of Education in Utah; when those resources were exhausted and the program was cancelled, the BYU Public School Partnership became interested in offering a similar kind of professional development opportunity for school principals and administrators.

Although a Principals Academy had been a long-term goal of Center for the Improvement of Teacher Education and Schooling (C.I.T.E.S.) at Brigham Young University, the primary impetus for the current program was the enactment of the federal legislation entitled, Public Law 107-110 ("No child left behind," 2002), more commonly known as the No Child Left Behind Act (C.I.T.E.S.). Title II of the Act addresses the preparation, training, and recruitment of high quality teachers and principals. In particular, Subpart 1, Section 211 requires states to make appropriate changes to ensure that "principals have the instructional leadership skills to help teachers teach and students

learn" and "provide teacher mentoring, team teaching, reduced class schedules, and intensive professional development" ("No child left behind," 2002).

Each year, school district superintendents choose approximately 25 mid-career administrators from schools in the BYU-Public School Partnership to participate in the Principals Academy. The Principals Academy at BYU provides a venue for networking and development of professional support systems that help principals become instructional leaders within the professional learning communities in their schools. The Academy has its foundations in the moral dimensions of teaching and the goal of consistent and simultaneous educational renewal (Goodlad, Soder, & Sirotnik, 1990). It actively empowers principals in their efforts to create and nurture professional learning communities in their schools. The Principals Academy accomplishes its goals through the discussion of readings and issues relevant to school administrators. In addition, the Academy facilitates activities, workshops and retreats that require members to come together on a regular basis, usually monthly, during the first two years. All retreats, discussion topics, texts, and activities have been carefully selected and designed to meet the particular needs of school principals as they work to transform their schools into professional learning communities in order to improve both teacher and student learning.

During their first year, members of the Academy meet monthly to build and expand their knowledge of pertinent issues. Throughout the second year, members work on implementation in their schools of ideas they discussed during the first year. The monthly meetings continue to be structured and relatively formal. In their third year and after in the Academy, principals meet together four times a year and turn their attention to the institutionalization of professional learning communities within their schools.

Through participation in continuing education, professional socialization, and dialogue on real school issues, the Principals Academy assists school administrators in creating a culture that is conducive to establishing and nurturing professional learning communities in their own schools. Thus, not only is participation in the Academy meant to train and support school principals, but also to improve the schools and districts where they are employed. Ultimately, principals' participation in the Academy should aid student learning as they implement practices and procedures learned in the academy.

Although attrition rates for Principals Academy members are low, each year some principals still drop out because of changes in work assignments or for personal reasons. This study considered principals to have been subject to sustained preparation if they had been or were currently participating in the BYU Principals Academy for any length of time. Teachers were grouped in cohorts depending on the year their principal joined the academy.

Even though school principals throughout the nation may have access to workshops, conferences, and seminars that offer appropriate professional development opportunities, the unique nature of the BYU Principals Academy should not be understated. The sustained professional development experiences offered by the Academy are intrinsically different from the one-time, often sporadic opportunities for training, professional socialization, and learning provided in other settings.

<div align="center">Research Problem</div>

Because most of the existing literature on professional learning communities is focused on case studies that either describe the general characteristics of professional learning communities or identify the presence or absence of these communities in

schools, in-depth research on the individual characteristics of professional learning

communities is needed to add clarity and value to this growing movement. In order to

understand the complex effects of sustained preparation offered by the Principals

Academy on teamwork and collaboration in schools, teachers must be surveyed. Figure 1

provides a simple conceptual model of the research problem this study addresses.

Figure 1. General Conceptual Model of Research Study

Purpose Statement

This study generates empirical data by surveying teachers and administrators to

discover the extent that successive years of involvement by the principal in the BYU

Principals Academy affect teamwork and collaboration in his or her school. This study

involves an examination of the unidimensionality of the different measures derived from

the survey data. This study is also interested in determining whether there are significant

differences between the attitudes and experiences with teamwork and

collaboration of teachers in schools where the principal is a member of the

Principals Academy. The data were also analyzed in order to ascertain how

the level of teamwork and collaboration reported by teachers varied depending

on the length of time their principal had been a member of the academy.

Definitions

Chapter Two contains detailed definitions of the main terms and concepts in this study; however, for the sake of clarity, a brief definition of each term has been included here. This study defines "sustained preparation of principals" as the training and development opportunities offered through the BYU Principals Academy. "Successive years of involvement in the Principals Academy" refers to the number of years a principal participates in the Academy. Since the Academy is in its fifth year of operation, the membership ranges from 1 to 5 years. The control group consists of 25 principals with no involvement in the Academy and teachers from their schools. A "professional learning community" brings all school personnel into a shared vision, collective responsibility, and collaborative activities so that learning through sharing becomes embedded in the school culture and positively affects student learning. "Teaming" involves teachers working together, generally in formal situations, to accomplish work tasks. Teaming is viewed as a subset of collaborative activities in general. "Collaboration" is broader in scope than teaming, and includes both formal and informal activities which occur in either a planned or spontaneous manner.

Delimitations of the Study

In order to answer the research questions detailed above, it is necessary to explain the following limitations in the study:

1. The target population for the study was the five school districts (Alpine, Jordan, Nebo, Provo City and Wasatch County) in the Brigham Young University Public School Partnership in the state of Utah as well as the Carbon School District, a rural school district located outside of the

partnership area but whose principals participated in the Principals Academy.

2. The sample for the study was selected from the target population but limited to those educators who had e-mail addresses available on individual school websites.

3. For the purposes of this study, principals who had received sustained development were identified as those who are or have been members of the Principals Academy. The control group was comprised of teachers whose principal had neither participated in nor been selected for involvement in the Academy and was selected randomly.

4. Because the Principals Academy emphasizes the development and maintenance of professional learning communities, this study assumes that principals who are members of the academy will have nurtured, to varying degrees, professional learning communities in their schools.

<div align="center">Research Questions</div>

This study facilitated improved understanding of professional learning communities by providing empirical data with respect to teamwork and collaboration in schools. The following three questions guided the research for this study:

1. To what extent are aggregated survey items valid, reliable, and unidimensional measures of teachers' attitudes and experiences with teamwork and collaboration?

2. To what extent do differences exist between measures of attitudes and experiences of teamwork and collaboration for teachers in schools where the

principal has received differing levels of sustained preparation through the BYU Principals Academy?

3. What factors motivate and deter teachers from participation in collaborative activities, such as teamwork, in schools?

Implications and Significance of Study

The prevailing tide of research in this area emphasizes the crucial role of teamwork and collaboration in schools, particularly those schools with professional learning communities. This research study examines how sustained principal development affects teachers' experience with and attitudes toward collaborative activities and teamwork in schools. Because the crux of this study is the experience of teachers with collaboration and teamwork, the results will fulfill five useful purposes: provide a basis for comparison for similar studies in the future, allow principals to identify collaborative practices which may be more or less helpful to them as they build professional learning communities, inform advocates of the professional learning communities movement about the realities of teaming and collaboration in K-12 education in Utah, provide information as to the effects of sustained principal training on collaborative practices in schools, and add understanding and insights to the Principals Academy theory and practice.

CHAPTER TWO

REVIEW OF THE LITERATURE

The No Child Left Behind Act of 2002 called for some of the most radical and sweeping changes in American education since 1965 when the Elementary and Secondary Education Act was implemented (Pankake & Moller, 2003). However, while the scope of the changes required by the No Child Left Behind Act is unprecedented (Toppo, 2004), the American education system has for centuries been subject to frequent waves of school reform initiatives. This almost constant demand for reform has produced a variety of solutions and approaches. One of the latest and most promising of these approaches is the establishment of professional learning communities in schools. This innovative tool not only helps teachers and administrators make the changes demanded by the reform, it provides an environment and structure for ongoing assessment and exchange of ideas so that teaching and learning will be improved constantly and the need for sweeping reform obviated.

DuFour and Eaker (1998) asserted that "the most promising strategy for sustained, substantive school improvement is developing the ability of school personnel to function as professional learning communities" (p. xi). Hord (2004) underscored this view: "The question of how to transform low-performing or underperforming schools into high-achieving schools is not easily answered. But . . . professional learning communities can play a major role in turning troubled schools around" (p. 5). Hord (2004) further pointed out that "through their participation in a professional learning community, teachers become the first learners, continuous learners and more effective teachers. In turn, student outcomes increase" (p. 5). Huffman and Hipp (2003) noted that "Professional

learning communities are increasingly identified as critical to the success of school reform efforts" (p. 4).

While interest in and research on living and learning communities for college undergraduates continues to grow (Smith, MacGregor, Matthews, & Gabelnick, 2004), researchers have begun to focus on professional learning communities within K-12 schools. Pioneering studies in this area suggest that because professional learning communities transform how teachers teach and learn, they provide the key to improvements in teaching and ultimately, in student learning (DuFour & Eaker, 1998; Elmore, 2004; Hord, 2004). That said, Hord (2004) asserted that "professional learning communities still lack the credibility that comes from substantial research reporting improved outcomes for staff and students" (p. 4).

This study will review the literature on professional learning communities primarily from the past three decades. Because of the interconnected nature of the professional learning communities movement, those conducting research on this topic represent a variety of different fields including staff development, organizational development and change, school improvement, and innovation (DuFour & Eaker, 1998). Because research suggests that the most effective professional learning communities are those which employ collaboration and teamwork, this study will also include a discussion of literature concerned with these practices in schools.

<div align="center">Educational Reform</div>

Since Horace Mann introduced the notion of "common schools" in the middle of the nineteenth century, reform has been a central and unrelenting theme in the American education system. Because reform of the nation's schools has been viewed as a key to

reforming society, during the last several decades the call for educational reform has come increasingly from the political arena (Reese, 2005), with the result that reforms have been initiated at the school, district, state, and national level with varying frequency and foci.

<div align="center">*Problems with Educational Reform*</div>

Despite their good intentions for improving student learning by "fixing" educational problems, past experience shows that most reform efforts enjoy only partial success or fail altogether. Elmore (2004) suggested one reason for this failure was that "our capacity to initiate and sustain reform has exceeded, to a considerable degree, our capacity to solve the problems that undermine the effects of reforms" (p. 3). Indeed, teachers often become overwhelmed by continuing to teach their students while simultaneously grappling with reform initiatives from several sources, each with its own particular focus. Cuban (1984), however, reported an even deeper reason for the failure of educational reforms. He noted that teachers tend to teach in the same way even in the presence of reform efforts, and that this "teaching culture . . . breeds conservatism and resistance to change in instructional practice" (p. 243).

A further problem with educational reform lies in the complex and multidimensional nature of educational systems. Serious reform efforts must identify and address problems that occur at different levels within educational institutions, otherwise they run the risk of creating disjointed, incomplete results (McGrath, Donovan, Schaier-Peleg, & Buskirk, 2005). In a case study of San Diego's recent system-wide reform, Darling-Hammond and colleagues (2005) recognized that "Any reforming school district is a moving target, where improvement efforts will continue to be shaped and reshaped

over time" (p. 191). Thus, it is important to view the process of reform as both fluid and flexible.

While reform efforts need to be directed at the various levels of educational institutions, each level engenders its own, unique problems. Local reform initiatives, for instance, are often volatile and superficial (Elmore, 2004). At this level, schools often move quickly from one reform idea to the next in a short period of time and tend to choose reforms that have only a shallow impact on the problems they need to address. On the other hand, reforms mandated at the federal level, such as the No Child Left Behind Act, require such sweeping changes that they may lead to uproar and chaos.

Educational Reform and Professional Learning Communities

Educational issues have consistently ranked among the top concerns for U.S. voters over the last decade (McGrath et al., 2005). Politicians recently answered this concern with the *No Child Left Behind Act* ("No child left behind," 2002). While the initiative has strengthened the public focus on schooling and education, having a federal mandate handed down to states each with its own education system has proved problematic. The vast array of issues addressed by the Act made it difficult to know where to begin the reforms and the Act's strict timelines for compliance required schools to implement some changes quickly. Professional learning communities were pioneered as a way to meet some of the Act's mandates immediately, while providing a structure for teachers and administrators to plan and initiate ongoing changes.

Professional Learning Communities

This section will define professional learning communities, enumerate the characteristics of professional learning communities, establish the case for professional learning communities and identify a link between professional learning communities and professional development.

Definition of Professional Learning Communities

Although the emergence of professional learning communities cannot be pinpointed exactly, current literature documents them, albeit on a relatively small scale, since the early 1990s (DuFour & Eaker, 1992). Smith and colleagues (2004) noted that

> The contemporary concept and implementation [of professional learning communities] started to build into a national movement in the mid-1980s with substantial expansion in the mid-1990s. Now they have become so widespread that the term learning community is used to apply to many different educational strategies. (p. 20)

Smith and colleagues (2004) went on to say that the flexibility of learning communities is one of their most useful characteristics: "what has made [them] attractive and widespread is this adaptability; educators can shape and reshape the strategy around specific . . . needs" (p. 22).

Professional learning communities have been known by a number of different names over the years, depending on the context in which they have been adopted. The term "communities of practice" was coined by Wenger (1998) through his research on social learning systems. DuFour and Eaker, both educators, used several terms for the concept, including "shared-responsibility teams or quality circles" (1992), "communities

of commitment" (1998), and "communities of caring and mutual concern" (1998). Cross (1998) referred to professional learning communities in the context of adult learning theory as "communities of knowledgeable peers," and Fullan (2000), an educational change specialist, used the term "collaborative work cultures." Hord (2004) referred to professional learning communities in education as "communities of continuous inquiry and improvement" (p. 1). When Senge (1990) proposed the notion of learning organizations, it did not take educators long to apply this label to educational environments and to explore the potential for learning organizations within the school context. Relatively quickly, educators changed the term from "learning organizations" to "learning communities" (Hord, 2004). As Smith and colleagues (2004) noted, this flexibility of learning communities is one of their most useful characteristics: "what has made [them] attractive and widespread is this adaptability; educators can shape and reshape the strategy around specific . . . needs" (p. 22).

Smith and colleagues (2004) described undergraduate learning communities in higher education as, "intentional structures designed to address specific issues and raise collective aspirations in the context of a campus's mission and culture and they often develop out of the passion and energy of certain faculty and staff leaders" (p. 95). This statement aptly describes professional learning communities, as well, although these differ from undergraduate learning communities in their scope, membership, longevity, and outcomes. Huffman (2003) defined a professional learning community as "a school's professional staff members who continuously seek to find answers through inquiry and act on their learning to improve student learning" (p. 4). Hord (1997) provided a similar and widely accepted definition, "a collegial group of administrators and school staff who

are united in their commitment to student learning. They share a vision, work and learn collaboratively, visit and review other classrooms, and participate in decision making" (p. 2). Thus, key themes that are at the heart of learning community design and implementation in any context are community, integration, active learning, diversity, and reflection and assessment (Smith et al., 2004).

While professional learning communities should not be viewed as a panacea for all school problems, they do offer their members options and opportunities for growth and learning with their professional peers in a way that other reform initiatives have not. In addition, they are flexible enough to accommodate changes required by future reforms. Huffman and Hipp (2003) emphasized this idea by stating that we should "recognize that the creation of a professional learning community is not an end in itself. It is, rather, an infrastructure for supporting school improvement so that, ultimately, the level and quality of student learning increases" (p. 81).

Characteristics of Professional Learning Communities

Professional learning communities are characterized by a variety of factors. Some researchers in this field have identified a range of elements and characteristics often found in professional learning communities. For example, Duffy (2003) recognized three cultural elements that must be designed into a school's internal social architecture to support professional learning communities: trust, commitment, and collaboration, a team structure and a belief in continuous learning and improvement (p. 212-213). Hord (2004) conducted in-depth research into professional learning communities and proposed five characteristics of professional learning communities: supportive and shared leadership, shared values and vision, collective learning and application of learning, supportive

conditions, and shared practice. She pointed out that "these dimensions are not isolated, but are intertwined. Each dimension affects the others in a variety of ways" (p. 7).

Matthews and colleagues (2006) noted ten elements of professional learning communities from their research with the Principals Academy at Brigham Young University: common mission, values, goals, that are focused on teaching and learning, democratic leadership that is focused on teaching and learning, high-trust embedded in school culture, interdependent culture, teaming that is collaborative, academic success for all students with systems of prevention and intervention, decision-making based on data and research, continuous assessment, principal leadership focused on student learning, and professional development that is teacher driven and embedded in daily work.

While some of the characteristics of learning communities can be clearly defined and articulated, others cannot. Smith and colleagues (2004) commented that professional learning communities "create venues for synergistic activity to occur among people and ideas" (p. 23). By its nature, "synergistic activity" cannot be defined before it occurs, however, in his narrative on "Schools that Learn," Senge (2000) explored the interrelations between synergy and learning organizations in an educational context to illustrate how schools can become communities that learn.

The Case for Professional Learning Communities

The case for professional learning communities can be made by examining their use in higher education. Learning communities have been used at the undergraduate level for a number of years to respond to a number of concerns: (a) promote intellectual communication between faculty and students, (b) make connections among courses, (c) bridge students' academic and social worlds, (d) increase students' retention, (e) enrich

residential life for staff, (f) give faculty new perspectives and (g) promote greater interaction (Hurd & Stein, 2004). While not all of these concerns are germane in a professional learning community within a public school, some of them are particularly helpful in learning to understand the value of teachers talking to teachers and recognizing the ultimate goal of professional learning communities—that is to improve student learning.

The success of professional learning communities in schools hinges on the teachers. At the heart of the success of any school is its workforce of teachers, or as Little (2002) argued, its teachers' professional relationships Although American schools were patterned after the factory model of solitary workers each doing his or her own job, a model popular until around the 1960s, the professional learning community movement has its roots in the communal, collaborative model proposed by DuFour and Eaker (1998) where collaboration is embedded into the routine practices of the school. DuFour and Eaker (1998) added that if schools are to change to become professional learning communities, they must be willing to adopt a new approach to education:

> Educators must be prepared first of all to acknowledge that the traditional guiding model of education is no longer relevant in a post-industrial, knowledge-based society. Second, they must embrace ideas and assumptions that are radically different than those that have guided schools in the past. (p. 20)

Hurd and Stein (2004) made a relevant point in this regard: "Research has more than amply demonstrated that involvement is a key to student success . . . . Simply put, the more students are involved with faculty, staff, and peers, the more likely they are to learn and persist" (p. ix). Although Hurd and Stein focused their observations on learning

communities at Syracuse University, much of their research applies to professional learning communities within public schools.

Research also demonstrated that consistent and meaningful interaction with professional peers is important to teacher success in the classroom (Darling-Hammond, 1996). The more teachers are involved with district personnel, principals and other teachers, the more likely they will persist and succeed in the face of successive waves of educational reform. Smith and colleagues (Smith et al., 2004) noted that "because they can provide a holistic and coherent approach to reform, learning communities offer a potentially more sustainable approach than many more narrowly based reform initiatives" (p. 20).

Both teachers and their students have the potential to benefit from increased collaboration in schools. Darling-Hammond (1995) viewed professional learning communities as a method for building school capacity, particularly capacity connected with increased student learning. Further, the nature of positive teacher collaboration in schools can build an excitement for learning in students rarely found in schools where teachers tend to work in isolation (Shellard, 2004). Shellard (2003) cited four studies that demonstrated the positive relationship between professional learning communities in schools and student learning. She also noted that there was evidence to suggest that students in schools characterized by strong professional learning communities may have lower drop out rates and fewer absences in addition to enhanced learning experiences.

Professional Learning Communities and Professional Development

Professional learning communities are distinctly different from traditional forms of professional development, which are still the norm in many schools and districts. Elmore (2004) aptly described traditional professional development activities:

> Most school systems organize formal professional development around specified days. Teachers are relived from their regular duties to participate in activities that are usually unrelated to instructional practice, except in the broadest sense of the term. Designed to serve the widest possible audience, system wide professional development is usually focused on specific and disconnected topics—student discipline, test preparation, district and state policy changes—and typically occurs in large group settings away from classrooms and schools. (p. 100)

Professional learning communities allow teachers to learn *in situ*, without removal from environments they typically frequent during the course of a school day. Integrating professional development into the classroom, the faculty lounge, etc., sets the stage for teachers to begin to collaborate and learn together within their school. It encourages its participants to view professional development as a communal, continuous, and integrative activity, rather than as an interruption to their routines. Smith and Fenstermacher (1999) addressed this notion when they described three main purposes for staff development:

> . . . to enrich the lives of teachers and administrators so they continuously expand their general education, their emotional range, and their understanding of children; to generate continuous efforts to improve schools; and to create conditions which enable professional skill development to be continuous. (p. 173)

When teachers work together to improve teaching and learning, the school can be transformed into a learning community where working, studying and growing together constitute an integral component of school life. In this way, professional learning communities embed professional development activities and experiences into the daily lives of teachers.

The process of creating and sustaining professional learning communities is vastly different from the process of planning traditional professional development exercises. To those who would design and implement professional learning communities in their schools, DuFour and Eaker (1998) offered a thought-provoking warning:

When the challenge of creating a professional learning community is reduced to a recipe or formula, it is easy to overlook the fact that this task is a passionate endeavor. A school does not become a learning community simply by advancing through the steps on a checklist, but rather by tapping into the wellsprings of emotion that lie within the professionals at that school. (p. 280)

Hord (1987) reminded those involved in developing professional learning communities that "innovation and its successful implementation take time" (p. 164). Hord's claim was recently strengthened by the work of faculty at Bristol University (E.P.L.C., 2005) in England, who demonstrated the lengthy period of time professional learning communities take to become firmly established.

Glickman noted that "the professional learning community approach is grounded in adult learning theory" (A.I.S.R.), while traditional professional development is not (Glickman, Gordon, & Ross-Gordon, 2001): "If schools are to be successful, supervision must respond to teachers as changing adults" (Glickman et al., 2001, p. 57). For instance,

early in their careers teachers are often motivated by career advancement, but as they move toward retirement, personal and professional development considerations may become progressively more spiritual and existential (Mayes, 2005). As teachers grapple with second half of life issues, "carrot and stick" professional development techniques may become less effective. Professional learning communities, on the other hand, provide a structure in which teachers at varying stages in their careers can learn and grow together.

Establishing professional learning communities by no means signals an end to more traditional forms of professional development. In some circumstances, an in-service lecture is the best vehicle for conveying information. Thus, traditional forms of professional development have their place within the context of professional learning communities.

Barriers to the Development of Professional Learning Communities

Researchers have identified numerous barriers to the development of professional learning communities in schools. DuFour and Eaker (1998) listed several barriers to the successful implementation of professional learning communities in schools, including the complexity of the task, a misplaced focus with ineffective strategies, a lack of clarity of outcomes, the failure of many professional learning communities to persist, and a lack of understanding of the change process. Perhaps the most significant of these is encouraging both educators and the public to better understand and value professional development. As Sparks (2004) argued,

> If all students—black, white, rich and poor—are to acquire deep understanding;
> learn to solve problems creatively; develop the ability to work in teams and

independently; and seek, through their concern about others, to contribute meaningfully to the public good, teachers must pursue deep and continuous professional learning. (p. 304)

Hord (2004) further pointed out,

Development of professional learning communities cannot occur without a paradigm shift, among the public, among educators themselves about what the role of the teacher entails. Many in the public and in the profession believe that the only legitimate use of a teacher's time is standing in front of the class. (p. 14)

The paradigm shift required here, is likely to approach the magnitude of those described by Kuhn as "scientific revolutions" (1970).

Resistance to change poses another significant obstacle to establishing professional learning communities in schools. Since the predictable human response to change is resistance (Duffy, 2003), anyone promoting significant change should anticipate opposition. Duffy (2003) provided a series of principles to guide school administrators in their response to such resistance:

(a) create feelings of ownership and support for innovation, (b) people need both structure and freedom, (c) change happens to organizations-transitions happen to people, (d) people need to hear about change many times before accepting it, and (e) motivation to move forward must be greater than the need to stay put. (pp. 214-216)

Duffy (2003) reminded us that "one of the most powerful ways to respond to all kinds of resistance is through involvement" (p. 217). Rather than relying on a few department

heads and administrators to spearhead development of a professional learning community, the principal needs to involve the whole school community in the process.

"Change is difficult" (DuFour & Eaker, 1998, p. 49). In an age of constant change and reform, teachers and administrators grow weary and wary of new ideas and models for school improvement. Even the process of building individual elements of professional learning communities, such as teams, takes a huge volume of work (Caudron, 1994). Because effective change is difficult, complex and time-consuming is a serious obstacle to the type of school-wide transformation necessary to nurture and support a professional learning community.

The isolation experienced by many teachers is another impediment to professional learning communities. In traditional teaching models, teachers seldom have opportunities for working collaboratively with their peers (John Goodlad, 1984). DuFour and Eaker (1992) noted that "The isolation of teachers is apparent to anyone who has spent time in the classroom. This isolation poses a formidable barrier to effective school improvement" (p. 73). As Little (2002) pointed out,

> For teachers to engage seriously in professional communication with their colleagues, they must be able to initiate open and critical discussions of instruction. Mentoring and advising must constitute an accepted and valued aspect of school life. Staff must be able to put forward new ideas and critically evaluate ideas as they are tried out in practice, but also live with one another through the messiness of discovery. (p. 51)

Teachers who rarely work collaboratively with other teachers will likely be reluctant to do so when the opportunity presents itself, and even if they are willing, they lack the experience to make collaboration an effective and ongoing process.

In spite of the many positive outcomes of successful professional learning communities documented in the literature, Hord (2004) warned that there is no guarantee these communities can solve all of the challenges faced by low-performing schools. However, professional learning communities offer one of the most promising approaches to school change and reform in the twenty-first century.

<div align="center">Collaborative Activities and Teamwork</div>

Given the vast array of different activities that pass for teamwork and collaborative in schools, this section will explore definitions of teams, work groups and collaborative activities as well as factors that inhibit collaborative activities in schools.

<div align="center">*Definitions of Teams and Work Groups in Schools*</div>

Depending on the context, teams take on a variety of different forms. Katzenbach and Smith (1993) defined a team as, "a small number of people with complementary skills who are committed to a common purpose, set of performance goals, and approaches for which they hold themselves mutually accountable" (p. 165). Katzenbach and Smith (1993) highlighted three types of teams: recommender teams, doer teams and managing teams. However, because their analysis of teams stems primarily from business contexts, a narrower definition of teams in schools is needed here. It is worth noting that not all work groups should be classified as teams because group work does not necessarily equate with genuine, effective teamwork (Katzenbach & Smith, 1993).

Pounder (1998) noted that teams in the workplace have a variety of names, including "self-managing work groups, self-determining work groups, task oriented work group" (p. 66). She recognized three main types of teams in educational settings: management teams or school advisory groups, special services teams and interdisciplinary instructional teams (p. 70); among these, interdisciplinary instructional teams "hold the greatest promise for significant and substantive change in schools and their outcomes for students and teachers" (1998, p. 71). Richardson (2005) asserted that professional learning communities and teams are synonymous: "many teachers don't immediately recognize that professional learning community is the new name for a team" (p. 1).

Definitions of Collaborative Activities in Schools

Collaborative activities are commonly viewed as less formal and structured than teamwork. Such activities and practices are also more difficult to define than teamwork because they may involve few or many ideas, entities, and stakeholders and because, like teams, they take on a variety of forms. As Fullan and Hargreaves pointed out, "What passes for collaboration amounts to very different things at different schools" (Fullan & Hargreaves, 1996, p. 46). Fullan and Hargreaves (1996) further noted that

> . . . collaborative cultures are to be found everywhere in the life of the school: in the gestures, jokes, and glances that signal sympathy and understanding; in hard work and personal interest shown in corridors or outside classroom doors; in birthdays, treat days, and other little ceremonial celebrations; in the acceptance and intermixture of personal lives and professional ones; in overt praise,

recognition and gratitude; and in sharing and discussion of ideas and resources.

(p. 48)

Leonard and Leonard (2003) considered faculty meetings, grade-level meetings, departmental/subject meetings, team teaching, sharing materials, lesson planning, and examination preparation as collaborative activities. Little (1990) observed collaboration in "various forms of coaching and consultations to shared decision making, interdisciplinary teams, subject discipline, collaborative" (p. 6) and joint work, sharing, and naturally occurring reference groups. These groups may be deliberately organized, or arise spontaneously based on functional connections between teachers, or be a reflection of the school's cliques or factions (Little, 1990).

However, Little (2003) further pointed out that "teachers get together for many reasons over the course of the school year, but rarely are they invited to look closely together at evidence of student learning" (p. 187). She asserted that in order to create and sustain effective teamwork, the school administration must embed the concept in school culture by providing time for collaboration, and using schedules and routines which encourage teachers to converse with each other about teaching and learning. So central is this notion of creating a collaborative environment, that some researchers use the terms "collaborative practices" and "collaborative cultures" interchangeably (DuFour, 2004). Hargreaves (1994) characterized collaborative teacher cultures as "typically involving working relationships between teachers and their colleagues that tend to be spontaneous, voluntary, development-oriented, pervasive across space and time, and unpredictable" (p. 192).

Researchers also discussed several less spontaneous approaches to teacher collaboration. Among these are teacher networks (Lieberman & Wood, 2001), in which teachers learn by teaching other teachers and by peer review. Teacher collaboratives (Little, 1993) provide yet another approach. These groups encourage teachers to work with other educators in their subject area, without respect to school boundaries or institutional level. Little (1993), for instance, described an experience with Philadelphia's humanities collaborative in which teachers could receive mini-grants of $300 for individual classroom projects, but could receive ten times as much if they worked with other teachers, universities, or community members on their project. In addition, colloquia sponsored by the same collaborative allowed teachers from different schools to engage in teamwork that entailed "an altered set of relations between the schools and other institutions and between teachers and other experts" (Little, 1993, p. 135). Little (1993) also discussed a variation of teacher collaboratives in which schools and universities become partners to allow teachers, faculty, and administrators to work together on projects, and to re-examine their roles and relationships.

Teachers' Privacy and Isolation as Barriers to Collaboration in Schools

Although strategies for teamwork, participative decision-making and collaboration have been discussed for decades in teaching theory (Pounder, 1998), evidence for effective collaboration remains woefully rare in practice (Schmoker, 2004). Research (Duffy, 2003; DuFour & Eaker, 1998; Hord, 2004) indicated that collaboration and teamwork are not factors common to most professional learning communities in schools across the nation.

Pounder (1998) asserted that while there has been significant and systematic research since the early 1980s on teamwork in business, industry and other non-educational settings, little has been done to address teams and work groups in educational contexts. She surmised that this is because work groups and teams occur less frequently in educational environments. Similar obstacles to developing effective professional learning communities in schools also hinder teamwork and collaboration; however these latter are additionally vulnerable to counterfeits which appear to be collaborative, but in fact deter effective teamwork and meaningful collaboration. Fullan and Hargreaves (1996) described three of these counterfeits: balkanization, comfortable collaboration, and contrived collegiality. A fourth counterfeit could be described as cooption which occurs when school leaders seek to have teachers conform to their own particular views while insisting that the process is voluntary (Fullan & Hargreaves, 1996). And indeed, they do occur less frequently.

A "culture of individualism . . . and state of professional isolation" (Fullan & Hargreaves, 1996, p. 38) continues to be the traditional mode for teachers' work, despite the many discussions in recent years of collaboration and teacher teams (Pounder, 1998). Generally speaking, teachers continue to teach alone in their individual classrooms; make decisions about issues pertaining to their own classroom; and have limited interaction with other teachers. In fact, teachers experience isolation from the beginning of their professional lives, as they are encouraged to try to work things out themselves rather than ask for assistance (Lortie, 1975). Little (1990) noted that teachers with many years of experience rarely offer advice to beginning teachers and thus reinforce the implicit ethos of isolation. One new teacher reported a distinct lack of collegiality in her school

(Bullough, 1989). Her isolation was so pronounced that she had never visited parts of the building occupied by teachers outside of her own subject area. Membership in different teacher unions further reinforced the divided and cliquey nature of the staff.

Grundy and Bosner (2000) explored the effects on schools of recent calls for teachers to work more collaboratively. They found clear aspirations toward collective work, particularly consultative and collaborative decision making, from over ninety per cent of respondents. They noticed, however, considerable differences in the pattern of responses from teachers and those from principals.

Katzenbach and Smith (1993, p. 166) asserted that "spending lots of time together" (p. 166) is one of the factors needed to establish successful teams. But most teachers do not have even a little extra time away from their classrooms, rendering it impossible to find time for the collaborative work which characterizes effective professional learning communities. Morrissey (2000) argues for principals to schedule time into the school day for collaborative work–and value the outcomes of such work–as a first step in stemming the pervasive tide of isolation in teaching. It is up to the principal, too, to enlist teachers' support of teamwork and collaboration so that the interactions will not be forced or contrived (Little, 1990). If teamwork seems artificial, manufactured or false, then teachers will relegate it to the periphery of their tasks and it will be of only limited use. As an example, teachers often work collaboratively to secure resources, but continue to have little contact with one another on more substantive matters (Little, 1990). Fullan and Hargreaves (1996) argued that, "at all levels—from the board administration to the school professional development—a good proportion of staff

development resources be allocated . . . to opportunities for teachers to learn from, observe and network with each other" (p. 103).

Scheduling time for collaborative teamwork, however, is only a first step. It is one thing to work cooperatively during allotted time, and quite another to have teacher conversations (both formal and informal) throughout the school day and beyond, which reflect a value for teamwork and collaboration. The sad reality that teaching is an extremely private profession is borne out by the words of one teacher, "in my building, we do not share achievements or knowledge, even in department meetings. What we share are gripes and disappointments" (Maeroff, 1988, p. 475). The latter depends on collaboration and teamwork having become imbedded in the school's culture. Since, for instance, student work is generally considered to be the teacher's work as well (Little, 2003), if the principal has not succeeded in establishing a collaborative culture in the school, then teachers will not be comfortable with peers reviewing and commenting on their students' work. Even time set aside for teamwork and collaborative inquiry will likely be unproductive. As Sparks (2004) warned, the type of professional learning required to bring about positive changes within the education system "will occur only within collaborative cultures" (p. 306). Both educators and the public they serve will need to re-envision teaching as a communal activity, and teachers as collaborative members of productive professional communities (Little, 1993).

The Role of the Principal in Professional Learning Communities

School principals play a critical role in the development of professional learning communities in the schools they have responsibility for. As Senge (2000, p.15) noted, "The impetus for change and reform often comes first from the principals, deans, and

other administrators of individual schools. These are the instructional leaders for teachers—the people who set the tone for learning within the school" (p. 15). The school principal plays a crucial role in both establishing and maintaining a professional learning community within the school. DuFour and Eaker (1998) discussed this important role at length, identifying the school administrator as vital to the success of professional learning communities in schools. Similarly, Leithwood (1990) emphasized that other conditions, such as collaboration and collegiality must be the norm if the professional learning community is to function properly within the school.

A principal will need to use overt and intentional strategies in order to develop a professional learning community in his or her school (Senge, 2000): "A professional community does not develop by itself. The three corners of organizational architecture: guiding ideas, innovations in infrastructure, and theory, methods and tools, must come together to reinforce one another and generate a climate that draws forth new attitudes, beliefs, skills, capabilities, awareness, and values" (p. 334). School principals, as the guardians of this process, must collaborate with teachers at all stages of developing the learning community so that it will "belong" to all of its participants. Huffman and Hipp (2003) said that "whether or not a school principal engages with faculty and staff during an innovation or change effort can determine its success or failure" (p. 149); and Fleming (2004) noted that, "to address increasingly complex responsibilities, some principals have created communities of staff learners. These principals use their leadership role to demonstrate and encourage continuous learning for themselves and all staff members" (p. 30). Fleming (2004) claimed the results of research at five schools that successfully operate professional learning communities provide "clear evidence that the administrator

is key to the existence of a professional learning community" (p. 20). In all cases, Fleming found that principals actively utilized an external event or outside force as an opening to create professional learning communities. Hall (1987), synthesizing the work of others, reported that "the principal was identified as a key influence on the adaptability of a school and on the process of change" (p. 45). Senge (2000) related the experiences of the principal of Skowhegan High School, Maine, who wanted to develop a shared vision and promote professional dialogue in her school. She succeeded in moving the school "from balkanization towards professional community" (p. 338).

According to Fullan (2003), few principals can develop learning communities without significant improvements in their own organizational development skills: "Most principals currently do not have the capacity to operate in this new mode. To expect great leadership in the absence of capacity is to squander opportunity and resources" (Fullan, 2003, p. 74). The message is simple and clear—"the preparation of school administrators is key" (Huffman & Hipp, 2003, p. 149) to the success or failure of professional learning communities. With this is mind, we can see the value of Principal Academies and Principal Centers, which provide professional development experiences for principals while simultaneously modeling the sort of professional learning community the principals can develop within their own schools (Levine, 1989).

<div align="center">Summary of Literature</div>

Educational reform has been a consistent feature of the American education system throughout the majority of the 20th century. The rate and scale of different reform initiatives has proved problematic, in particular, the federally mandated No Child Left Behind act has been the source of great debate.

The concept of professional learning communities in education has gathered momentum over the past two decades. Professional learning communities offer a realistic, school-wide response to educational reform initiatives as they have the potential to leverage schools by providing teachers with the opportunity to become lifelong learners.

Professional learning communities are characterized by several elements, including collaboration and team work. Teachers engage in a variety of different types of team work and collaborative activities through their work in schools. Teams generally have a well defined, formal purpose. In contrast, collaborative activities are more difficult to define as this term is often used to cover a wide range of both formal and informal activities.

In spite of the great potential of professional learning communities to tackle the persistent problem of privacy and isolation within the teaching profession, such problems continue to present a formidable barrier to effective teamwork and collaboration in school environments. School principals play a critical role in the development of professional learning communities in the schools they have responsibility for. Sustained professional development, training, support, and positive reinforcement from the principal are important factors in the success or failure of professional learning communities in schools.

CHAPTER THREE

METHODS

The purpose of this study was to explore whether there was a difference between the attitudes and experiences of teachers toward teamwork and collaboration in schools where professional learning communities have been established for varying lengths of time through the principal's membership in the BYU Principals Academy. Given that one of the foci of the Principals Academy is the development of professional learning communities in schools, it is hypothesized that administrators who are members will implement ideas and concepts as a result of their participation in the Academy and seek to establish professional learning communities in their schools that display a high level of teamwork and collaboration amongst professional colleagues. Three research questions guided the study.

Conceptual Basis for Methodology

The review of literature pertinent to this topic in Chapter Two highlights the growing trend in K-12 education both nationally and internationally towards the development of professional learning communities in schools. Professional learning communities provide a venue for teachers to learn and grow as a natural part of their work (DuFour & Eaker, 1998) in order to ultimately improve student learning. Additionally, professional learning communities represent a significant departure from more traditional forms of professional development for teachers such as in-service training (Elmore, 2004).

According to some of the researchers and writers in this field (Duffy, 2003; DuFour & Eaker, 1998; Hord, 2004), two of the critical characteristics or elements common to many successful professional learning communities are collaboration and teamwork. However, the purpose of all of the teamwork and collaboration that takes place schools is not always the improvement of student learning (Fullan & Hargreaves, 1996). Likewise, teachers in schools that do not have a professional learning community undoubtedly utilize teamwork and collaboration in the work place.

Teamwork and collaboration occur for a variety of reasons in many different types of schools, regardless of the presence or absence of a professional learning community in the school. The primary goal of this study was to gauge whether there was a difference between the attitudes and experiences of teachers towards teaming and collaboration in schools where professional learning communities have been established for different lengths of time. Since I measured teamwork and collaboration with a new instrument, an intermediate goal of the study that was necessary in order to achieve the primary goal was to establish unidimensionality for different factors developed from the survey questionnaire. The secondary goal of this study was to explore different reasons for collaboration and teamwork among teachers in schools. These goals are reflected in the research questions for this study:

1. To what extent are aggregated survey items valid, reliable, and unidimensional measures of teachers' attitudes and experiences with teamwork and collaboration?

2. To what extent do differences exist between measures of attitudes and experiences of teamwork and collaboration for teachers in schools where the

principal has received differing levels of sustained preparation through the BYU Principals Academy?

3. What factors motivate and deter teachers from participation in collaborative activities, such as teamwork, in schools?

This chapter provides a description of the research methods, collection of data, and an overview of the proposed analysis of the data. In addition, this chapter will also include a summary of the value of this research to scholars and practitioners in the field of education and beyond.

<div align="center">Research Design</div>

The debate over whether quantitative methods are better than qualitative methods has raged for decades, and it appears that the answer generally depends, to a certain extent, upon the purpose, scope, and context of the research. Pring (2000) reinforced this notion with his statement that "different approaches are used to answer different questions. Different sorts of questions require different sorts of research. Researchers must be eclectic in their search for truth" (p.33). After careful consideration of the demands of the research questions to be addressed, I selected a research methodology for this study that was quantitative in nature.

In spite of the more egalitarian approach to research emphasized by Pring (2000), who characterized the divide between quantitative and qualitative methods as "the false dualism" (p. 44), confusion remains because quantitative and qualitative procedures are frequently viewed as methods that compliment each other more than they conflict. A mixed methodology that combines both quantitative and qualitative techniques allowed

the researcher to answer a broader set of research questions. Furthermore, Hite (2001) pointed out that

> the objective of quantitative research, as distinguished from qualitative research, has always been to assert, investigate, and generate results and theories that are generalizable. Quantitative research in education was modeled on the scientific method basic to the physical sciences. Therefore, the results of quantitative research present the greatest likelihood of applicability in settings other than those in which they were conducted. (p. 17)

The quantitative methods selected for this study allowed the first and second research questions to be answered. These methods provided results that may be generalizable beyond the context of the sample. Specifically, the results of research question two may be generalized to provide greater understanding of the effect of the Principals Academy experience on teachers over time, particularly in the future. Another factor in the determination of the research method for the portion of the study was the availability of existing surveys that could be adapted for this purpose.

The content analysis methods employed by this study allowed the third research question to be answered and added clarity and insight to the results from the quantitative research. This was accomplished by adding three open-response questions to the survey questionnaire that formed the basis of this study that required a content analysis. Patton (2002) suggested that qualitative research is helpful in "adding depth, detail, and meaning to quantitative analyses" (p. 193). The qualitative elements in this study were primarily interpretive and descriptive in nature and certainly added value to the results as a whole, albeit on a limited scale. The mixed methodology used in this study provided results and

consequent opportunities for interpretation in order to answer the research questions on multiple levels.

<div align="center">Sampling</div>

The target population for this study is teachers in schools where the building administrator had previously participated, was currently participating in or may participate in the future, in the Principals Academy. However, because the population of principals who may participate in the Academy in the future cannot be identified, the best alternative in this case was a sampling frame focused on teachers from schools where the administrator was currently participating in the BYU Principals Academy. Current participation or active membership in the Academy, for the purposes of this study, is defined as principals who appear on cohort lists provided by the CITES office at BYU as actively participating in Academy activities.

A survey methodology with questionnaires disseminated by e-mail was selected for this study. Various factors such as the relative accessibility of classroom teachers were considered in making the decision to construct an online survey to be deployed by e-mail. Both the original nature of the survey instrument and the decision to disseminate it via e-mail impacted the sampling frame by dictating the method for contacting teachers, which in turn affected selection of subjects because only those with e-mail addresses could be invited to participate in the study.

The sampling frame included twelve teachers from every school where the building principal had been a member of the Principals Academy since its inception in 2002 through 2006 (with the exception of those who were no longer employed as administrators in one of the six target districts). However, the attrition rate for principals

in the Academy and difficulty experienced in securing e-mail addresses for teachers at certain schools, reduced the sampling frame markedly and prompted the decision to send the survey to twelve teachers at every school where the principal was a current members of the Academy for whom e-mail addresses were readily available.

<p align="center">*Principals Academy Cohorts*</p>

All participants in the Principals Academy cohorts were drawn from schools in the five school districts that participate in the BYU-Public School partnership, namely, Alpine, Jordan, Nebo, Provo City, and Wasatch County School Districts, with a small number from Carbon School District. E-mail addresses were gathered from the websites of schools where the principal was a member of the Principals Academy. Because of natural attrition, turnover, reassignment, retirement, and medical and personal reasons, it was only possible to include 60% of the principals listed on Principals Academy rolls in the study.

Those invited to participate in the survey were divided into five cohorts based on the longevity of each principal's membership in the BYU Principals Academy. The 2002 cohort was based upon the group of principals who began their membership in the Principals Academy in August 2002, the 2003 cohort was based upon the group of principals who began their membership in the Principals Academy in 2003, and so on for each year through 2006 cohort to create the five groups or cohorts.

Because the Principals Academy was in its fifth year of operation at the time of the study and between 21 and 30 principals have been invited to attend each year, there were approximately 128 principals who had been members of the Principals Academy for varying lengths of time during the time of this study. Table 1 shows the number of

principals in each Principals Academy cohort as well as the breakdown of Principals

Academy membership by school district.

Table 1

Principals Academy Membership by School District

District	2002	2003	2004	2005	2006	Control
Alpine	7	7	8	7	7	7
Carbon	0	8	0	0	0	2
Jordan	6	6	7	8	9	7
Nebo	4	6	5	6	6	5
Provo	3	2	2	2	2	2
Wasatch	1	1	2	2	3	2
No District	0	0	1	0	0	0
Total	21	30	25	25	27	25

Note. Discrepancies between the number of principals in the Academy and the number of teachers invited to participate in the survey occurred because some principals were no longer serving as building principals or their school websites did not contain teachers' e-mail addresses and as a result, teachers from their school could not be included in the sample.

The sampling strategy for the teachers within individual schools involved a

stratified random sampling technique that was used to select twelve teachers from each

school where the administrator was an active member of the Principals Academy. This

sampling technique was well suited to the demands of this study as it allowed the teacher

population to be divided into subgroups to ensure that an adequate number of subjects

were selected from each type of school as well as grade level and subject specialty

(McMillan, 1992), thus reducing the possibility of under coverage of subject or grade

level teachers.

For secondary schools, twelve academic subject teachers (delimited to the areas of

science, social studies, math, and English) were selected and invited to participate in the

survey. The decision to limit participation to academic subject teachers was prompted by

the need to exclude teachers of elective subjects who would likely, by virtue of their

numbers or the nature of their specialty, have fewer opportunities for teaming and

collaboration than academic subject faculty who often work closely in departmental

groups with several other teachers in the same area.

For elementary schools, the sample was stratified so that those selected to

participate in the survey provided coverage of grades K through 6. Table 2 shows the

breakdown of teacher selection based on either subject or grade level taught. This

sampling strategy was designed to yield a pool of participants, arranged in five different

cohort groups based upon the length of the principals' membership in the Principals

Academy.

Two factors influenced the number of teachers in the sample. First, a handful of

administrators dropped out of the Principals Academy each year and their names were

not included in the academy lists obtained from CITES and so it was impossible to

include teachers from these schools in the sample. Second, because the survey instrument

was administered online, only teachers with e-mail addresses could be included in the

sample. In the end, 768 teachers (12 per school) were invited to complete the survey as

part of one of the five cohorts. This figure represents a 50% reduction in the projected

number of teachers based the number of principals who have participated in the Academy since its inception.

Table 2

Breakdown of Teachers Invited to Participate in Survey by Grade Level or Subject Taught

Elementary Schools (Grades)		Middle Schools (Subjects)		High Schools (Subjects)	
K, 1, 2	4	Math	3	Math	3
3, 4	4	English	3	English	3
5, 6	4	Social Studies	3	Social Studies	3
		Science	3	Science	3
Total	12		12		12

Study Cohort Characteristics

The nature and composition of the five cohorts varied based on the relative number of principals from elementary, middle, and high schools and the numbers of principals from each school district in each Academy cohort. Those who work with the Principals Academy reported a lower level of participation and a higher rate of attrition for high school principals who become members of the academy than elementary school principals (Matthews et al., 2006). The schools from which teachers were invited to participate in the survey were determined by the membership of their Principal in the Academy.

Different cohorts were also characterized by different features, for example, high school principals were entirely absent from the 2002 cohort and principals from Carbon School District were present only in the 2003 cohort. Table 1 illustrates the composition of the different cohorts with regard to school districts and was used to create the control group by ensuring that each district was represented in the control group at similar levels as in the five cohorts.

The Control Group

The control group for this study was constructed through the addition of a group containing 25 principals (this figure was based upon the average membership in each of the five Principals Academy cohorts – see Table 1) who were not current or past members of the BYU Principals Academy and were selected from the same six school districts as Academy participants. Twelve teachers from each of their schools were invited to participate in the survey. The goal was to create a group that had no record of prior participation in the Academy. Administrators and their schools were selected by a stratified random sample to reflect similar numbers, that is elementary, middle, and high schools, as in the five other cohorts of teachers described above as well as to ensure similar representation from each school district as the other cohort groups. Table 3 shows the percentage of Academy members from each school type. These percentages were used in the construction of the control group.

As with the other five cohorts, the control group was configured so that at the secondary school level the sample was stratified to include academic subject teachers only, and at the elementary level the sample was stratified to include coverage from different grade levels. The composition of subjects in the control group was based upon

Table 3

All Principals Academy Members (2002 -2006) by School Type

Type of School	# of Schools	Percentage
Elementary	84	67%
Middle/Junior High	29	23%
High	12	8%
District Office/USOE	3	1%

the average number of principals from each of the six school districts across the 2002 cohort to the 2006 cohort and closely mirrored the average numbers of elementary, middle, and high school principals reflected by the other five cohorts.

Once the control group was developed, the next step involved gathering contact information for the entire sample (the five cohorts and the control group). Spreadsheets with contact information for administrators who were members of the BYU Principal Academy were obtained through the Center for Improvement of Teacher Education and Schooling (CITES) office at BYU. In order to draw the sample of teachers from schools where the principal was a member of the Principals Academy, e-mail addresses for teachers in different grade levels or subjects at each school were gleaned from individual school websites. Teachers were selected from school websites using a random numbers table. In some cases, the school website either did not provide e-mail address or information on grade levels or subjects taught by teachers that was necessary for stratification so it was not possible to include these schools in the sample. E-mail

addresses were only available for about 60% of the schools where the principal was a member of the Academy.

It should be acknowledged that some of the principals who were members of the Principals Academy had left employment in the six districts targeted by this research project, or were now on other assignment within the district; however, this was found to be on a relatively small scale in most of the Principals Academy cohorts with the exception of the 2002 and 2003 cohorts, and did not adversely affect the desired sample size. In total, 912 teachers spread across the five cohorts and the control group were invited to complete a survey questionnaire, which was sent to them via e-mail.

The absence of teachers' e-mail addresses from school websites forced a reduction in the number of teachers who could potentially be invited to complete the survey. Table 4 shows the number of schools in each cohort where teachers' e-mail addresses were available.

Table 4

Schools with E-Mail Addresses for Teachers

Year	Schools with E-Mail Addressed for Teachers
2002	4
2003	14
2004	12
2005	10
2006	19
Control	12

It should be acknowledged that some of the principals who were members of the Principals Academy had left employment in the six districts targeted by this research project, or were now on other assignment within the district; however, this was found to be on a relatively small scale in most of the Principals Academy cohorts with the exception of the 2002 and 2003 cohorts, and did not adversely affect the desired sample size. In total, 912 teachers spread across the five cohorts and the control group were invited to complete a survey questionnaire, which was sent to them via e-mail.

<div align="center">The Survey</div>

Initially I set out to create an entirely original instrument for this study. However, after reviewing the literature on professional learning communities, several existing surveys were identified as potentially helpful in the development of a survey for this study. After researching these instruments and considering the demands of the research questions, I decided to create a survey that drew upon elements of three existing surveys developed by Leonard and Leonard (2003), Matthews and colleagues (2006) and Bryk and Schneider (2002).

Leonard and Leonard's (2003) instrument from their work with teachers in Louisiana schools proved a highly suitable source of concepts, ideas, and questions for survey development. In addition, a draft survey from Matthews and colleagues (Matthews et al., 2006), with appropriate modifications, was also a useful resource in creating a new survey tailored to the demands of this study. In particular, the fact that Leonard's (2003) survey had been administered previously in Louisiana rendered the instrument attractive because of the apparent similarities between Louisiana and Utah,

with both states generally considered to be relatively conservative and to have relatively low per pupil spending on education (N.E.A.R., 2005).

In addition, the works of Bryk and Schneider (2002) and Gee, Hull, and Lankshear (1996) were also used as a guide for the development of the questionnaire with some of the items and ideas adapted from instruments they created. In addition, careful attention was given to widely accepted norms for questionnaire construction, structure and assembly as noted by Bourque (1995) and Fowler (2002) in order to produce a "user-friendly" online questionnaire.

The Preparation

Developed specifically for this project, the primary research instrument for the study was a survey questionnaire. The 39 item questionnaire was developed with the purpose of eliciting from teachers information about their attitudes, experiences, ideas, and perceptions of teamwork and collaboration in their schools. A copy of the questionnaire is included in Appendix A.

The first part of the survey was structured to allow teachers to respond to a series of 14 paired Likert scale questions. The paired questions prompted each participant to answer each question first with regard to their attitudes about teamwork and collaboration and then based on their own experiences with teamwork and collaboration in the workplace. The second part of the survey was comprised of three open response questions that allowed participants to write as much or as little as they chose about teamwork and collaboration in their school. The third and final section of the survey dealt with basic demographic data such as gender and type of school.

One of the critical factors that influenced modifications, changes, and additions to early drafts of the survey was the number of questions. Careful consideration was given to achieving a balance between having a survey with enough items to enable the research questions to be answered, while simultaneously being short enough to entice busy educators to take the time to complete it.

The Structure

The questionnaire begins with some brief, general instructions that introduce the instrument as a whole. Dillman (2000) documented the societal trend towards self-administration of surveys and because the questionnaire was disseminated by e-mail and, therefore, self-administered in the absence of the researcher, it was imperative that the directions for completing the questionnaire be extremely explicit (Bourque & Fielder, 1995). Beyond the initial instructions, the questionnaire was divided into three different sections, each with different types of questions focusing on different aspects of collaboration and teamwork in schools. Three main types of questions were included in the questionnaire: closed questions in a paired format for attitudes versus experiences with a seven point Likert scale in section one, open-ended questions that provided an opportunity for free response in the space provided in section two, and closed questions concerned with demographics with predetermined response categories in section three.

The closed questions presented in a paired format with a seven point Likert scale allowed a comparison of the attitudes and actual experiences of survey respondents with collaboration and teamwork. Attitude questions were typically phrased in the following format: "Teachers should . . .", while experience questions were generally phrased as follows: "In my school, teachers . . ." After some deliberation, the seven point Likert

scale was selected over a five or a six point scale because of the desire to allow respondents to express a degree of agreement or disagreement and also be able to choose the middle ground if their feelings were neutral or if they had no opinion.

The purpose of including three open-ended questions on the survey was to answer the third research question regarding the factors that motivate and deter teachers from participation in collaborative activities. The open-ended questions also offered participants the opportunity to respond in more depth and to share their opinions on the topics covered by the questionnaire. The rationale behind gathering basic demographic information on the survey was connected with increasing the utility of the data. For example, it was necessary to know the school district in which a teacher taught so that responses could be appropriately grouped for subsequent analysis. Further, the demographic information was needed in order to understand the composition of respondents regarding school, grade level or subject. In addition, the demographic data was used to calculate accurate response rates for different categories of respondent such as teachers working in elementary schools and teachers working in secondary schools, or teachers in a certain school district.

The Administration Procedures

Because the survey was administered via e-mail, particular attention was given to wording and length of the recruitment e-mail (see Appendix B) that accompanied the questionnaire to ensure that the wording was simultaneously informative and motivational, yet not coercive. The recruitment e-mail replaced the traditional cover letter often included with questionnaires and surveys distributed by conventional mail services. Details concerning the purpose of the study, reasons why participation was important,

manner in which participants were chosen, and estimated time to complete the survey were included, albeit briefly, in the recruitment e-mail.

Permission to disseminate the survey was requested from BYU's Institutional Review Board (IRB). Due to the nature of the survey and the characteristics of the human subjects involved, the IRB committee determined that the study posed minimal risk to human subjects and granted approval (Appendix D). In addition, permission to disseminate the survey to teachers and principals was requested from each of the six school districts. The Alpine and Jordan districts required completion of a separate research application followed by committee approval and the Nebo district required an explanatory letter about the study and a monetary deposit before research could begin.

The Pilot Analysis

In an effort to ensure the content and clarity of the survey questionnaire, I conducted a two-stage pilot analysis. Following the assertion by Litwin (1995) that "one of the most important stages in the development of a new survey instrument involved trying it out on a small sample population" (p. 60), the questionnaire was administered to two small pilot groups of participants who reflected the characteristics of the actual sample participants. The pilot was used to improve clarity and reduce the likelihood that participants might not understand the survey questions or find them unclear or ambiguous.

Stage One Pilot Testing

Pilot testing was divided into two parts. The first stage of the pilot involved contacting faculty members who taught classes in the BYU Leadership Preparation Program (LPP) to ask permission to pilot the questionnaire with their classes. A pilot

sample of fifteen individuals was identified. Because students in the LPP are all teachers and aspiring administrators, I anticipated that this group would be able to provide helpful feedback on the structure and design of the survey.

Pilot participants in the first stage reviewed a hard copy of the survey instrument rather than taking the survey online. They received a hard copy of the recruitment e-mail, consent form, questionnaire, and evaluation sheet (Appendix E). Participants were asked to complete an evaluation form that solicited comments and feedback on different aspects of the survey such as the clarity of the directions, appropriateness of questions, use of terminology, word choice, and the length of time taken to complete the survey. Additionally, I conducted short cognitive interviews with four of the pilot participants to gather more detailed feedback and guidance on the usability and appropriateness of the questionnaire. The results of the first stage of the pilot analysis facilitated refinements and changes, particularly in the areas of word choice and phraseology to the instrument, which made it more fit for its purpose of eliciting information about teachers' experiences with teamwork and collaboration.

Stage Two Pilot Testing

The second stage of the pilot involved testing both the instrument and the online survey tool, Zoomerang. I asked students in the BYU Executive School Leadership Program (ESLP), a group of aspiring teachers and administrators who meet in the evening, to respond to an electronic version of the recruitment e-mail, consent form and questionnaire. The demographic for the second part of the pilot was similar to the first pilot group in that they were all teachers and aspiring administrators. I asked participants to provide feedback and suggestions on the questionnaire in order to make improvements.

However, for this pilot I had only minimal face-to-face contact with the participants since my goal was to mimic the actual survey process those invited to participate would experience. Pilot participants were asked to complete the consent form and questionnaire online and then record their feedback and suggestions on an evaluation form.

Participants in both the first and the second stage of the pilot analysis were excluded from the population from which the sample was drawn to eliminate the possibility that some might be invited to participate in the actual survey as well as the pilot and bias the results because they had seen the survey previously.

Data collected from the evaluation sheets completed by pilot participants and information from the short cognitive interviews with a handful of pilot participants was considered in order to make changes to the questionnaire. Thus, the pilot analysis resulted in minor changes to the structure, content and wording of the questionnaire. Participants in both pilot groups cautioned against the use of the term "professional learning community." They argued that many teachers would not understand what the term meant even if their principal was nurturing, albeit subtly, aspects of a professional learning community in their school. However, I elected to leave the term in the questionnaire because professional learning communities were a central focus for the study. In addition, question 11a ("Teachers should receive professional development credit for team participation") and question 11b ("In my school, teachers receive professional development credit for team participation") were the source of some discussion with the pilot groups. It became apparent from discussion with pilot participants that whether or not a teacher received professional development credit for team participation was a rather contentious issue, generally decided as a matter of school district policy rather than on an

individual school level and, therefore, not entirely relevant to teacher attitudes or experiences.

The two stage pilot analysis was the first step in examining the reliability and validity of the instrument. McMillan (1992) described reliability as "the extent to which measures are free from error" (p. 104), while Litwin (1995) noted that validity assesses "how well it [the instrument] measures what it sets out to measure" (p. 33). Although the questionnaire based loosely on instruments developed by Leonard and Leonard (2003) and Matthews and colleagues (Matthews et al., 2006), it had not been used in its present format in any other study so it was not possible to test for certain types of validity until after the survey data had been collected.

Data Collection

Likely due to the growth in the use of e-mail, the prevalence of questionnaires sent via e-mail and taken online has drastically increased the convenience of sending surveys to large groups of individuals simultaneously at low cost (Dillman, 2000). Zoomerang, an online tool used in the creation and distribution of electronic surveys, was the vehicle for survey administration (2007).

I disseminated the survey questionnaire via e-mail with a recruitment e-mail (Appendix B) serving as the cover letter that included the link to take respondents directly to the consent form (Appendix C) followed by the survey (Appendix A). I anticipated that in order to reach the desired response rate of 60% I would send an initial recruitment e-mail message and two reminder e-mails to encourage as many individuals as possible to respond. An initial e-mail was sent out with a follow-up e-mail one week

later. A third and final reminder e-mail was sent out in an effort to encourage persistent non-responders to participate two weeks after the initial e-mail was sent.

Depending on the question type, participants clicked on the appropriate box to indicate their response for closed questions and typed their answers to open-ended questions in the space provided. Zoomerang was particularly useful in this study because it eliminated the need for questionnaire responses to be entered manually by the researcher, as it automatically collated participant responses in a format suitable for subsequent statistical analysis with only minimal manipulation.

Data Analysis

As previously mentioned, the primary focus of this study was quantitative. The Likert scale questions were analyzed with quantitative methods and the open-ended questions were analyzed with qualitative content analysis. The Zoomerang web application conveniently collated participant responses from the questionnaire into a spreadsheet format. The raw data were "cleaned" in order to ensure that the data were in an appropriate format for analysis using AMOS and SPSS. The spreadsheet containing the data was then inserted directly into Statistical Package for Social Sciences (SPSS) version 14.0. The mean, the standard deviation, and other basic descriptive statistics were calculated in SPSS. Cronbach's alpha was used as a measure of reliability or internal consistency and the exploratory factor analysis was used to determine if survey measures were valid for a unidimensional construct.

Establishing Dimensionality of Survey Variables

Initially I had hoped that all of the attitude questions and all of the experience questions from the paired Likert scale questions on the survey could be aggregated to

create separate measures for the attitudes questions and for the experiences questions. However, exploratory factor analysis including Cronbach's alpha was used as a measure of reliability, followed by confirmatory factor analysis that was used to establish whether these measures were valid for a unidimensional construct. Confirmatory factor analysis was particularly useful in this situation because it provided a mechanism to explicitly take into account measurement error for all observed variables (whether independent or dependent) in a model (Raykov & Marcoulides, 2006). I performed exploratory factor analysis using SPSS, while I used the structural equation modeling program, AMOS, to carry out the confirmatory factor analysis. The exploratory and confirmatory factor analysis was carried out in order to answer the first research question.

Exploring Differences among Cohorts and the Control Group

Based upon the results of the exploratory and confirmatory factor analysis, I identified a number of different measures or variables for both the *Attitudes* questions and the *Experiences* questions. The data were then regrouped to reflect the new variables identified from the factor analysis and subjected to several one-way Analysis of Variance tests (ANOVA) to discover if these variables differed depending on the different Principals Academy cohorts. ANOVA is a commonly used test for analysis of survey data (Fink, 1995) and is suitable for comparison of three or more means. Because ANOVA guards against Type I errors, it was very attractive for use in this study. Further, the ANOVA test was a particularly helpful statistic to use with this research study because it helped me to judge the difference in the mean in relation to the variability or spread of each cohort group. When the results of the ANOVA test showed a significant difference, I applied a post-hoc test, Fisher's Least Significant Difference to discover

where the differences in the means occurred (Creighton, 2001). I conducted ANOVA tests on a variety of variables from the attitudes and the experiences sections of the questionnaire in order to answer the second research question. Both the ANOVA test and Fisher's post-hoc test were calculated using the SPSS software.

Analyzing Open Response Data

In addition, to the statistical methods that were used with the questionnaire data, I analyzed the responses to the open-ended questions. Analysis of data gathered through open-response questions can be problematic because such responses are not systematic or standardized (Patton, 2002). Although the respondents were less likely to answer the open-ended questions because they were more time consuming, requiring participants to type a response rather than simply click a box, responses to the open-ended questions revealed both detail and depth in the data. I analyzed the data using basic content analysis that was performed manually.

The mechanics of the content analysis, which is often referred to as open coding, included highlighting of key words, ideas, experiences, issues, and thoughts in this case (Strauss & Corbin, 1998). I focused primarily on grouping the responses of teachers that shared a common idea in order to allow themes to develop. I also tallied the number of teachers who responded with similar information as a means for identifying the most prominent thoughts and themes involved. In addition, actual quotes from individual participants that were relevant to emerging themes were highlighted and drawn out to reinforce the results of the quantitative analysis. Following the analysis of the open response data provided by the open-ended questions on the survey, I made connections,

where appropriate, between the analysis and results of the quantitative and open response data.

Summary of Methods

In this chapter, I have discussed the research design and methods for this research study. A predominantly quantitative research methodology was the most suitable approach given the context of the study and the research questions set out in Chapter 1.

The sampling frame for this study included twelve teachers in each school where the principal had been a member of the BYU Principals Academy. The sampling frame also included teachers from school where the administrator had no prior experience with the Academy.

Five cohort groups of teachers were identified based upon each principal's longevity of membership in the Academy as well as the control group, comprised of teachers from schools where the principal had no history of or prior involvement with the Academy. However, the reality of this approach was that the sampling frame was constrained by factors such as reassignment to the district office, retirement, and employment in other districts meant that it was impossible to include teachers from all schools where the principal had been a member of the academy at some point in the study. Further, because e-mail addresses for teachers were obtained from school websites, schools without a website or schools with websites that did not provide contact information for teachers could not be included in the sample. As such, I made the decision to include all schools from the broad sampling frame that had e-mail addresses available for teachers in the sample. In total, I identified 912 teachers for inclusion in the sample as part of one of six groups.

Individuals in each of the five cohorts and the control group were sent an e-mail inviting them to complete a 39 item questionnaire, concerning their attitudes and experiences with collaboration and teamwork at school. The survey included both closed and open questions which generated data for both statistical analysis and content analysis. The quantitative data was first subjected to factor analysis to establish unidimensionality of the variables, summarized according to these findings, and analyzed using several one-way ANOVA tests, while the open response data was subjected to content analysis that was performed manually.

CHAPTER FOUR

FINDINGS

The underlying premise of this study was to examine three research questions concerned with the effect of sustained principal training on teamwork and collaboration in schools:

1. To what extent are aggregated survey items valid, reliable, and unidimensional measures of teachers' attitudes and experiences with teamwork and collaboration?

2. To what extent do differences exist between measures of attitudes and experiences of teamwork and collaboration for teachers in schools where the principal has received differing levels of sustained preparation through the BYU Principals academy?

3. What factors motivate and deter teachers from participation in collaborative activities, such as teamwork, in schools?

In order to answer these questions, I sent the initial survey recruitment e-mail in February 2007 followed by a reminder e-mail seven days later, and a final reminder one week after that. The online survey was open and available for participants to complete for a period of three weeks. This chapter focuses on the results and findings generated by the data collected from those who responded to the survey. First, response rates are examined, followed by the quantitative findings including both exploratory and confirmatory factor analysis and analysis of the Likert scale questions. Finally, the qualitative findings from the open response questions are discussed.

Response Rates

Overall response rates for the survey were calculated as well as response rates for each cohort and school district. In addition, item non-response was also considered as a way to better understand which questions respondents chose not to answer.

Unit Response Rates by Group and School District

Non-response for self-administered questionnaires is an issue that researchers cannot ignore (Bourque & Fielder, 1995). Even with the most careful attention to reducing non-response and highly motivated participants, "some non-response is inevitable" (Fowler, 2002, p. 50). However, response rates tend to vary depending upon the different media of the survey. While the body of research on e-mail surveys is relatively young, "the dynamics and challenges [of non-response] seem likely to parallel closely those of mail surveys" (Fowler, 2002, p. 50). Response rates for each cohort are shown in Table 5.

Table 5

Response Rates by Group

Cohort	Participants N (%)
2002	19 (40%)
2003	42 (27%)
2004	49 (34%)
2005	33 (27%)
2006	49 (22%)
Control	34 (24%)
Total	226 (25%)

The overall response rate was 25% and the 2006 cohort had the lowest response rate of 22%, while the 2002 cohort had the highest response rate of 40%. A total of 67 e-mail invitations were returned as undeliverable by the e-mail server. Omission of these subjects from the number in the sample would raise the overall response rate to 27%. The level of participation in the survey by educators from the six different school districts is shown in Table 6.

Table 6

Participation by School District

School District	Respondents N (%)
Alpine	73 (33%)
Carbon	6 (13%)
Jordan	50 (27%)
Nebo	58 (28%)
Provo	25 (17%)
Wasatch	14 (20%)
Total	226 (25%)

Item Non-Response

In addition to calculating response rates for each cohort and for each district, non-response was also examined. When the raw data was downloaded from the online survey tool, Zoomerang, 22 surveys with partially complete responses to the Likert scale questions were found. Five participants with more than three non-response items were

removed from the data set altogether. The remaining 17 partial responses that had three or fewer non-response items, however, were included in the analysis.

I acknowledge that considering only the overall response rate could obscure varying response rates for different types of questions, in particular, for the open-ended questions on the survey, which are often answered both less frequently and less well than closed questions. Generally speaking, because of the increased time and effort required when responding to open-ended questions, I anticipated that these questions would be the least well answered section of the questionnaire, and would have a lower response rate than the closed questions with the seven point Likert scale and the demographic questions.

The most common non-response items on the survey, however, were the demographic questions towards the end of the survey. Respondents appeared particularly reluctant to answer certain questions including 12 participants (4%) who declined to provide the name of the school where they were employed (item 11) and 7 participants (2%) who did not give the name of their school district (item 12). Several respondents in this category used the space provided for their answer to convey that they felt they could not provide this information because it would render them identifiable. Further, four respondents e-mailed to ask questions about anonymity and raised concern that either their district or their principal would be able to identify them from their responses to the survey. The Likert scale questions and open response questions were generally answered well with 7% of respondents missing one Likert scale question and 9% choosing not to respond to one or all of the open ended questions.

Quantitative Findings

Section one (paired Likert scale questions) and section three (demographic

questions) of the survey generated a large amount of quantitative data for analysis.

Descriptive Statistics

The demographic data was collated to provide information such as gender, type of

school and years of teaching experience for respondents. In order to facilitate

comparisons between questions, the mean and standard deviation were calculated for

each Likert scale question.

Demographic Information

Demographic information from the surveys is reported in Table 7. Twenty-seven

percent of respondents were male and 73% were female. Sixty-two percent of those who

Table 7

Basic Demographic Data for Survey Respondents (Teachers Only)

	Gender		Type of School		
Year	Male N (%)	Female N (%)	Elementary N (%)	Secondary N (%)	Average Years of Teaching Exp. $\overline{X}$ (s.d.)
2002	1 (5%)	19 (95%)	20 (100%)	0 (0%)	9.7 years (7.3)
2003	12 (29%)	30 (71%)	28 (67%)	14 (33%)	11.7 years (10.5)
2004	9 (18%)	40 (82%)	31 (63%)	18 (37%)	11.3 years (9.8)
2005	9 (27%)	24 (73%)	9 (27%)	24 (73%)	11.1 years (9.3)
2006	13 (27%)	36 (73%)	29 (59%)	20 (41%)	9.2 years (8.1)
Control	8 (20%)	26 (80%)	24 (70%)	10 (30%)	9.5 years (8.7)
Total	52	175	141	86	10.4 years (9.1)

participated taught at elementary schools and had an average of 10.4 years teaching experience. Table 7 provides a comprehensive view of relevant demographic information for the data generated by teachers' responses to the survey.

Likert Scale Questions

All of the results for the 14 paired attitude and experience questions were left-skewed, to varying degrees, with the exception of questions 7b, 11b, 13b, and 14b, which exhibited a more normal distribution. In all cases, the attitude question had a stronger skew than the corresponding experience question. All Likert scale questions were based on a 1-7 scale with the following descriptors: 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7 = strongly agree.

The average response on the 7 point Likert scale for attitude questions was 6.06 with a standard deviation of 0.97. This means that on average participants checked "agree" for the attitude questions and that most responses fluctuated "somewhat agree" and "strongly agree." The average response for experience questions was 5.16 with a standard deviation of 1.52, indicating that on average participants checked "somewhat agree" The means and the standard deviations for each question are reported in Table 8 and Table 9.

Dimensionality of Survey Variables

Two different types of factor analysis were employed to answer the first research question: To what extent are aggregated survey items valid, reliable, and unidimensional measures of teachers' attitudes and experiences with teamwork and collaboration? The

Table 8

Means and Standard Deviations for Likert Scale Attitude Questions

Question	Attitude $\overline{X}$ (s.d.)
1a. The work of teachers should involve teaming and collaboration that is focused on teaching, learning, and assessment.	6.46 (0.86)
2a. Schools that operate as professional learning communities encourage teachers to be more collaborative in their work.	6.39 (0.87)
3a. Professional learning communities in schools are an effective method of promoting collaboration and teaming among teachers.	6.07 (1.11)
4a. Teaching should be more about cooperation and teaming than about competition and individualism.	6.59 (0.80)
5a. Schools should be characterized by high levels of teacher participation in decision-making.	6.40 (0.86)
6a. Administrators should involve teachers when making decisions about issues related to teaching, learning, and assessment.	6.59 (0.67)
7a. Teachers need sufficient time to work together through teaming and collaboration.	6.67 (0.68)
8a. Frequent professional collaboration is an appropriate use of teachers' time.	5.92 (1.30)
9a. Teachers should collaborate because it improves their teaching.	6.37 (0.95)
10a. Effective teacher collaboration requires appropriate administrative support.	6.49 (0.79)
11a. Teachers should receive professional development credit for team participation.	6.05 (1.38)
12a. Teachers should be motivated to collaborate because of heir responsibility for all students' learning.	6.24 (0.96)
13a. Teachers should collaborate with other teachers in their school across curriculum and/or grade levels to discuss teaching, learning, and assessment.	6.01 (1.11)
14a. Teachers should collaborate with teachers from other schools.	5.57 (1.23)

Table 9

Means and Standard Deviations for Likert Scale Experience Questions

Question	Experience $\overline{X}$ (s.d.)
1b. In my school, the work of teachers involves teaming and collaboration that is focused on teaching, learning, and assessment.	5.81 (1.18)
2b. My school operates as a professional learning community, which encourages teachers to be collaborative in their work.	6.02 (1.13)
3b. In my school, the professional learning community is an effective method of promoting collaboration and teaming among teachers.	5.49 (1.43)
4b. In my school, teaching is more about cooperation and teaming than it is about competition and individualism.	5.59 (1.37)
5b. In my school, decision-making is characterized by high levels of teacher participation.	5.25 (1.54)
6b. In my school, administrators involve me when making decisions about issues related to teaching, learning and assessment.	5.41 (1.63)
7b. Teachers in my school have enough time to work together through teaming and collaboration.	4.77 (1.84)
8b. In my school, frequent professional collaboration is an appropriate use of teachers' time.	5.29 (1.52)
9b. Teachers in my school collaborate because it improves their teaching.	5.38 (1.46)
10b. There is appropriate administrative support in my school for effective teacher collaboration.	5.91 (1.46)
11b. In my school, teachers receive professional development credit for team participation.	3.71 (1.95)
12b. Teachers in my school are motivated to collaborate because of their shared responsibility for all students' learning.	5.24 (1.40)
13b. In my school, teachers collaborate across curriculum and/or grade levels to discuss teaching, learning, and assessment.	4.65 (1.55)
14b. In my school, teachers collaborate with teachers from other schools.	3.81 (1.79)

factor analysis also helped to establish the dimensionality of the aggregated measures of attitudes and experiences from the survey.

Prior to commencing the exploratory factor analysis, Cronbach's alpha, a statistic that determines how well a set of items measures a single unidimensional construct, was calculated for the attitude questions (0.829) and the experience questions (0.912). Figures for Cronbach's alpha that are close to 1.000 are generally considered to demonstrate a high level of internal consistency (Cronk, 2002).

Results of Exploratory Factor Analysis

Exploratory factor analysis was conducted using the "Principal Components" function in SPSS. Eigenvalues (that measure how much variance each successive factor extracts) for the variable *Attitudes* and the variable *Experiences* dropped rapidly after the first component, indicating that most of the explained variability was captured by the first factor, however, the component matrix for attitudes (Table 10) suggested that the 14 attitude questions were loading onto three possibly distinct factors, indicating that aggregating the attitude data into a single measure might be an oversimplification of the reality. Only factor loadings above 0.3 are indicated in the component matrix. 56% of the total variance was explained by these three components.

In Table 10, the absence of a loading for question 11a indicates that this question did not load onto any of the components. In addition, as question 14a is the only variable loading onto the third component, it would be difficult to justify the identification of a third factor with a single loading.

Table 10

Component Matrix for Attitudes

	Component		
	1	2	3
1a.	0.713		
2a.	0.747		
3a.	0.727		
4a.	0.590		
5a.		0.631	
6a.		0.635	
7a.	0.649		
8a.	0.721		
9a.	0.732		
10a.	0.541		
11a.			
12a.	0.785		
13a.	0.654		
14a.			0.546

For the item dealing with experiences the rotated component matrix indicated that the 14 experience questions were loading well onto three distinct components. 67% of the total variance was explained by these three components. The rotated matrix (Table 11) was used because it could be used to induce factor meanings and provided great detail on factor loadings.

For both the attitudes and the experiences component matrices, question 11 did not appear to load well as demonstrated by the unrotated component matrix in each case. Question 11b did load better on the rotated matrix for experience questions. Given that question 11b was concerned with whether or not teachers should receive professional development credit for teamwork and collaborative activities in schools and was the source of some discussion by the two pilot groups, it was not surprising that it did not load well onto any of the components or factors.

Table 11

Component Matrix for Experiences (Rotated with Varimax)

	Component		
	1	2	3
1b.	0.742		
2b.	0.806		
3b.	0.798		
4b.	0.605		
5b.	0.711		
6b.	0.680		0.524
7b.	0.610		
8b.	0.678		
9b.	0.587	0.525	
10b.	0.815		
11b.			0.845
12b.		0.705	
13b.		0.709	
14b.		0.769	

Results of Confirmatory Factor Analysis

The results of the exploratory factor analysis informed the starting point for the confirmatory factor analysis. Various models were developed and tested based upon the loadings illustrated by the exploratory factor analysis. That said, for both the attitudes and the experiences variables, baseline models where all of the indicators (questions) loaded onto one factor were developed and tested. These baseline models provided a comparison for all other models that were considered.

Initially a data set with all missing data eliminated was produced. In total, survey responses from 22 participants who had not answered one or more questions were eliminated. However, in order to be able to include these partial responses in the data set, it was necessary to make some adjustments to the raw data set prior to starting this process because AMOS could not handle missing data. The "Data Imputation" function,

with the stochastic regression imputation selected, was used to provide 5 different

permutations for the missing data. Each model was run using all six data sets (data set

with missing data eliminated plus the five imputed data sets) and it was determined that

the differences between the imputed data sets and the data set with the missing values

eliminated were minor such that the data set with missing values eliminated was used for

all of the models reported here.

Various models were used to ascertain how well the data fit the model. While an

abundance of different measures of model fit were available through AMOS, this study

focused on the TLI (Tucker-Lewis Index), the NFI (Bentler-Bonett Index or Normed Fit

Index) and the RMSEA (Root Mean Square Error of Approximation) (Kline, 2005, p.

143). Acceptable "cut-offs" for these measures are generally considered to be above 0.95

for the TLI and the NFI (although values between 0.90 and 0.95 are deemed acceptable

for both TLI and NFI), and 0.05 or lower for the RMSEA (although values between 0.05

and 0.08 are generally deemed acceptable).

The *Modification Indices* feature in AMOS was used to assess what adjustments

could be made to achieve an even better fit for the model. Generally by allowing

covariance between error terms, the fit of the model was improved. The final model for

the attitude questions is shown in Figure 2. Although the exploratory factor analysis

suggested that the attitude questions were loading onto three different factors, extensive

analysis of the data demonstrated that the best fit was attained when the attitude questions

loaded on to a single factor that I labeled *Attitudes*. Further, the best fit occurred when

Question 11a was excluded from the model. Relevant goodness of fit measures for the

final model include chi square of 101.9 with 55 degrees of freedom, 0.918 for NFI, 0.943
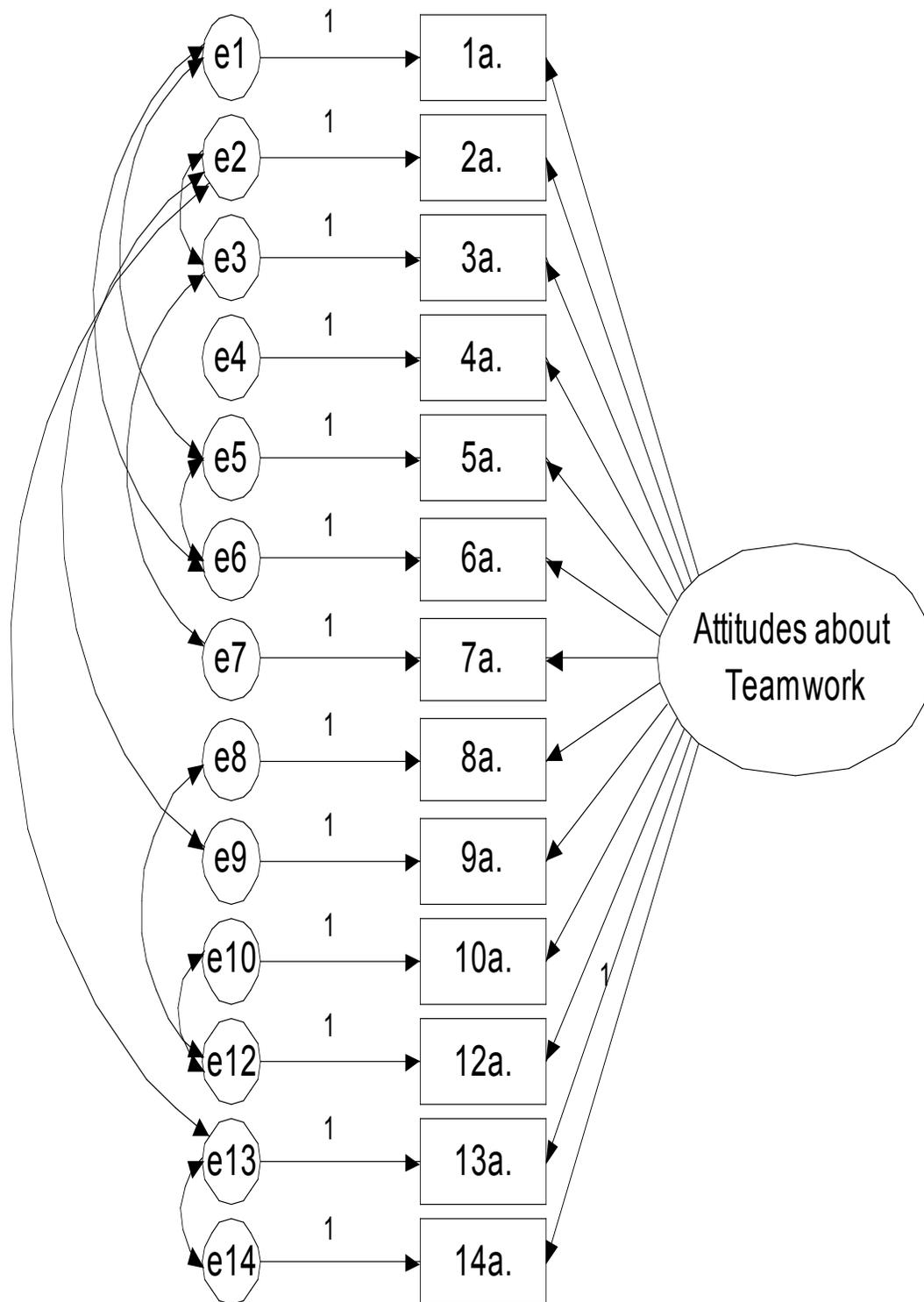
Figure 2. *Attitudes Model*

for TLI and, 0.058 for RMSEA.

The baseline model for the experiences questions was broken down into 3 separate factors: experiences with teamwork, experiences with collaboration, and collaborative decision-making that were tested in various iterations and several different models were considered. Again, modification indices were used to determine the goodness of fit of each model and also to adapt the model and achieve a better fit.

The final model for experience questions is shown in Figure 3, and includes two factors that I labeled Experiences with Teamwork and Experiences with Collaboration. Question 11b was excluded from the model to ensure a better fit. Relevant goodness of fit measures for the final model include chi square of 151.9 and 55 degrees of freedom, 0.940 for NFI, 0.953 for TLI, and 0.071 for RMSEA.

One important point with fitting a model is the need to avoid "over fitting." In other words, not all of the suggestions for modifications to improve the fit of the models should be implemented. Only those modifications that made sense were actually applied to the final models. For the most part, covariances were allowed between error terms within the same factor but not between error terms or indicators in different factors.

Dimensionality of Attitudes and Experiences

In the final experiences model, the indicators loaded onto two derived variables, with question 11b excluded. Establishing the number of variables actually present for both attitude questions and experience questions represented an important step in the research process as it fed directly into and added value to the outcomes of the ANOVA tests that followed because we could be confident that the derived variables used in that process: attitudes, experiences and collaboration, were relatively unidimensional.
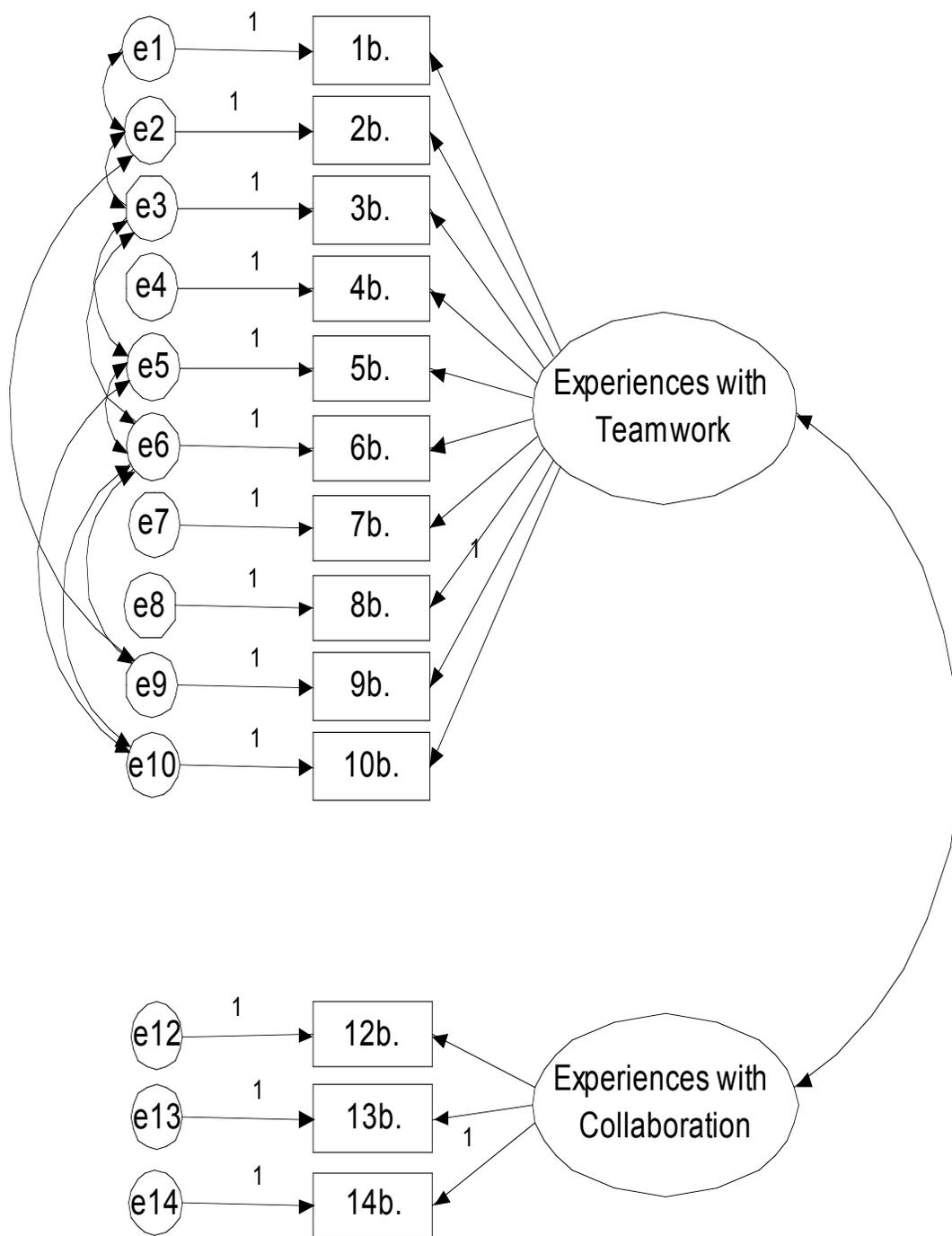
Figure 3. *Experiences Model*

I will use the following terms to describe different derived measures in the remainder of this study:

- *Attitudes about Teamwork* will refer to the analysis of the 13 attitude or (a) questions on the survey (with question 11a excluded) and for the ANOVA tests the same term will refer to a measure created by an aggregated average of Likert scale responses to 13 attitude questions.

- *Experiences with Teamwork* will refer to the analysis of the 10 experience or (b) questions on the survey (with 11b, 12b, 13b, and 14b excluded) and for the ANOVA tests the same term will describe a measure created by an aggregated average of Likert scale responses to these particular questions.

- *Experiences with Collaboration* will refer to a measure created by an aggregated average of Likert scale responses to questions 12b, 13b, and 14b on the survey.

ANOVA Analysis to Establish Differences among Groups

This section focuses on the analysis of the quantitative data and addresses the second research question: To what extent do differences exist between measures of attitudes and experiences of teamwork and collaboration for teachers in schools where the principal has received differing levels of sustained preparation through the BYU Principals Academy?

Differences among Groups on Survey Variables

In order to tackle this research question, I analyzed the survey data using one-way ANOVA tests. The independent variable in each case was the number of years of experience (between zero and five years experience) in the Principals Academy. The

dependent variables were the derived variables from the attitudes and experiences questions on the survey.

Depending on the length of involvement of school principals in the Academy, participants from each cohort were assigned a different value (from 0-5) in order to create a series of discrete levels. For example, participants in the 2002 cohort, who joined the Academy in 2002, were assigned the value five, participants in the 2003 cohort were assigned the value four, and so on while participants in the control group, who had no prior involvement with the Academy, were assigned the value zero.

I conducted three one-way ANOVA tests with the three derived outcome variables defined through the factor analysis; Attitudes about Teamwork, Experiences with Teamwork and Experiences with Collaboration as the dependent variable. The mean and standard deviation for these variables, by cohort, are shown in Table 12.

Table 12

Means and Standard Deviations for Attitudes, Experiences and Collaboration

Cohort	Years in Academy	*Attitudes about Teamwork* $\overline{X}$ (s.d.)	*Experiences with Teamwork* $\overline{X}$ (s.d.)	*Experiences with Collaboration* $\overline{X}$ (s.d.)
2002	5	6.57 (0.32)	6.19 (0.59)	4.45 (1.25)
2003	4	6.24 (0.68)	5.25 (1.39)	4.76 (1.11)
2004	3	6.27 (0.57)	5.51 (1.08)	4.56 (1.17)
2005	2	6.18 (0.56)	5.62 (0.92)	4.37 (1.37)
2006	1	6.25 (0.62)	5.63 (0.97)	4.36 (1.39)
Control	0	6.20 (0.61)	5.00 (1.22)	4.45 (1.25)
Total	--	6.27 (0.59)	5.49 (1.12)	4.56 (1.25)

All Likert scale questions were based on a 1-7 scale, where 1 represented "strongly disagree" and 7 represented "strongly agree." The mean scores and standard deviations in the measures revealed a pattern between the cohorts. Means of around 6 equate to "agree" on the Likert scale, means of around 5 equate to "somewhat agree," and means of around 4 equate to "neither agree nor disagree." For the three variables, Collaboration had the lowest mean and highest standard deviation while Attitudes about Teamwork had the highest mean and lowest standard deviation. For both Attitudes about Teamwork and Experiences with Team*work*, the 2002 cohort had the highest mean score, the lowest standard deviation and the smallest difference between the two means. These data suggest that, for the 2002 cohort, teachers' attitudes and their actual experiences with teamwork and collaboration are closely aligned. What teachers believe should be happening in this area appears to be closely associated with the reality of how they experience their work place.

The control group had the lowest mean score for *Experiences with Teamwork* and the largest difference between the mean for *Attitudes about Teamwork* and the mean for *Experiences with Teamwork*. This appears indicative of a situation where teachers' attitudes about teamwork and collaboration are more positive than their actual experiences. Further, the control group had the highest mean and lowest standard deviation for the *Experiences with Collaboration*, illustrating a situation where the control group, unlike the other cohorts, has not been immersed in professional learning communities in their schools, give artificially high scores that could demonstrate their lack of understanding of the concepts and ideas covered by the survey.

The results of the ANOVA analyses are shown in Table 13. The one-way ANOVA models were used to test for equality across the cohort for Attitudes about Teamwork, Experiences with Teamwork and Experiences with Collaboration. For Attitudes about Teamwork, no significant differences were found between the cohort groups (p= 0.283). Teachers' self-reported attitudes towards teamwork in the work place did not differ significantly depending upon the cohort. For *Experiences with Teamwork*, a significant difference at the 0.01 level (p= 0.004) was found among the means for the cohorts. For *Experiences with Collaboration*, no significant differences were found amongst the means (p= 0.131).

Table 13

Results of ANOVA Analyses for Three Outcome Variables by Group

Variable		Sum of Squares	Degrees of Freedom	Mean Square	F	Sig.
Attitudes about Teamwork	Between Groups	2.218	5	0.444	1.259	0.283
	Within Groups	77.498	220	0.352		
	Total	79.716	225			
Experiences with Teamwork	Between Groups	21.608	5	4.322	3.624	0.004
	Within Groups	262.339	220	1.192		
	Total	283.947	225			
Experiences with Collaboration	Between Groups	13.319	5	2.664	1.720	0.131
	Within Groups	340.819	220	1.549		
	Total	354.138	225			

The data for the 14 paired Likert scale questions was somewhat skewed. Given that ANOVA is a parametric test generally used with data that are normally distributed, the Kruskal-Wallis test, a non-parametric test suitable for use with data that are not normally distributed, was also conducted. The Kruskal-Wallis test produced the same differences in the means that were significant in the same areas. Because parametric tests are generally more sensitive than non-parametric tests, only the results of the ANOVA tests have been reported in this instance.

While comparing means for *Attitudes about Teamwork* and *Experiences with Collaboration* did not reveal any significant differences, *Experiences with Teamwork* did. Fisher's Least Significant Difference (LSD) test is a post-hoc test used to discover the location of significant differences between different cohort means after a one-way ANOVA test has been performed. Fisher's LSD test was used to determine the nature of the differences between different cohort groups, and produced the information shown in Table 14.

Table 14

Fisher's LSD Test After ANOVA Analysis for Experiences with Teamwork

	2002	2003	2004	2005	2006
2003	-0.945†	--	--	--	--
2004	-0.680†	0.264	--	--	--
2005	-0.570	0.374	0.109	--	--
2006	-0.564	0.381	0.116	0.006	--
Control	-1.194‡	-0.250	-0.514†	-0.624†	-0.630‡

‡ Significant at the 0.01 level, † Significant at the 0.05 level

Fisher's LSD post-hoc analysis revealed that significant differences were found between the 2002 cohort and the 2003 and 2004 cohorts (significant at the 0.05 level) and between the control group and the 2002 and 2006 cohorts (significant at the 0.01 level) and between the control group and the 2004 and 2005 cohorts (significant at the 0.05 level). No significant differences were detected between any of the other pairs of cohorts.

Differences among Groups for Individual Questions

In an effort to understand the derived variable, *Experiences with Teamwork*, I deemed it appropriate to disaggregate this measure in order to discover where differences may be significant for the individual questions that were used to create the measure. Ten one-way ANOVA tests were conducted with groups as the independent variable and each of the experience questions as the dependent variable. Seven of the questions, 1b (F=3.884, p=0.002), 2b (F=2.547, p=0.024), 3b (F=3.742, p=0.003), 7b (F=2.764, p=0.019), 8b (F=2.791, p=0.018), 9b (F=2.591, p=0.027), and 10b (F=3.054, p=0.011), yielded significant differences between cohort means through the ANOVA analysis. The level of significance for these results varied between 0.002 and 0.050. For questions 4b, 5b, and 6b, no significant differences were detected amongst cohort means. Questions 5b and 6b both concerned decision-making about teamwork and collaboration in schools. Analysis of these differences with Fisher's LSD post-hoc test showed the location for differences between cohort groups concentrated on the 2002 cohort, the 2003 cohort and the control group.

Qualitative Findings

Section two of the survey contained three open response questions that generated a large amount of qualitative data for analysis. The teachers' responses were coded to identify key themes and ideas.

Findings from Open-Response Questions

This section addresses the third research question: What factors motivate and deter teachers from participation in collaborative activities, such as teamwork, in schools? The data generated by the three open-ended questions were subjected to content analysis that was performed manually to draw out recurring themes and concepts mentioned by participants to highlight important ideas. Thomas (1998) identified 15 different types of interpretation through content analysis appropriate for use in educational research. For the purposes of this study, Thomas' "key themes interpretation" was employed to capture the core ideas revealed by participants' responses to each question. Response rates of the open-ended question were as follows: 5.3% of participants did not answer question 2, 6.2% of participants did not answer question 3, and 8.1% of participants did not answer question 4.

Key Themes by Question

Question 2 on the survey instrument asked educators to "List the different ways you team and collaborate with other teachers at work." While several themes emerged from an analysis of the responses to this question, I focused on the top three themes that were mentioned by the most participants. The first theme was connected with weekly team meetings. All but a handful of responses to this question made mention of weekly team meetings in either grade level or subject groups. The second theme concerned

discussion or dialogue with other teachers. Because the setting for such collaborative discussions were not provided, the assumption is that these conversations are taking place informally, outside of regular team meetings, in an unplanned, often sporadic, manner. Sharing was the third theme which was apparent and was mentioned in a variety of different contexts including sharing worksheets, lesson plans, assessment tools, expertise, and ideas. Minor themes, which were present in only a small number of responses and, therefore, did not appear in the top three themes covered collaboration and teamwork ideas such as peer coaching, team teaching, rotations, common prep periods, mentoring, team learning logs, and power lunches.

Through the responses teachers gave to question two, a hierarchy of three different levels of collaboration emerged. A small number of teachers, relatively evenly spread across all cohorts, offered comments such as, "We collaborate for basically everything. We are always teaching the same things." These teachers indicated a high level of collaboration and have found teaming to be a highly effective behavior in their work. Next, the bulk of responses to this question reported behavior that suggested a moderate or growing interest in and value for teaming and collaborative activities at school, "our team meets once a week and we talk" and "my coworkers and I get together once a week and discuss different ideas." The third and smallest group defined by their responses to this question were those who saw little value in collaborating with their professional peers or who complained that the environment at their school is not conducive to teaming. One teacher reported, "There is little time for collaboration (45 minutes per week), this is all we are allowed to do as organized by the principal. She is not very supportive of collaboration" while another noted that, "In theory, we are

"supposed" to be collaborating; but what is thought to have happened and what has really happened are two different things."

Of the three open response questions on the survey, question 3, which asked teachers to "Explain what your principal does to promote teaming and collaboration at your school" extracted the most telling and transparent responses. Provision of time (release days, early outs, protected meeting time, etc) for teachers to meet, team and collaborate was a clear front runner in terms of the number of teachers who mentioned it. In addition, the issue of encouragement from the principal to promote teamwork and collaboration came up multiple times. Generally speaking, however, respondents did not indicate details about what form this encouragement took on. Training was another idea which emerged. Some teachers indicated that their principals had provided them with training on how they could work together better as teams at school. A moderate number of teachers mentioned funding or other resources their principal had provided to help promote teamwork and collaboration in their schools.

A persistent theme that surfaced through analysis of all of the open response questions was that of principals forcing or coercing their teachers into pseudo-collaborative situations. Albeit on a relatively small scale, the dark side of the promotion of teamwork in schools was characterized by teachers who reported that their principals forced them to collaborate, spied on them during team meetings, "interfered" with team dynamics and, "didn't listen" to teachers views and ideas on collaboration. Question 4 on the survey asked educators to "Explain how collaboration and teaming in your school have affected your professional practice." The wide variety of responses this question received has been summarized in Table 15.

Table 15

Summary of Code Responses to Question 4

Positive or Negative	Code Responses
Positive	- Have become a better teacher - Learned from experience of others - Greater consistency across grade levels or departments - Feel more connected to other teachers - More aware of individual students needs - Feel more support from other teachers - More communication and "teacher talk" - Has helped with professional growth - More able to focus on students - Keeps teaching fresh - Fostered greater unity amongst teachers - Makes teaching much easier - Helps with professional transitions - Creates opportunities for professional reflection
Negative	- Wastes time - Feel more alone - Takes too much time - It's frustrating - It's unproductive - Colleagues won't share - It interferes with other things - Destroys teacher morale - Hurts students' learning in the long run - Everyone is competing—no time for collaboration - Forced collaboration is pointless

Not a single response demonstrated a mixed experience or ambivalence—teachers appear to be having either a positive experience with teamwork and collaboration or a negative one. No middle ground was apparent from participants' responses. Approximately 16% of responses to this question were categorized as negative and the remaining 84% as positive. Only responses that were made by ten or more respondents have been included in the table. Multiple responses by the same respondent have been included in this summary which is listed in no particular order.

Further, a handful of teachers alluded to a multiplier type effect that they believed was created through teamwork. In the words of one teacher, "I have become a better teacher. When we collaborate, we are able to get not only our best ideas and practices, but the best ideas and practices of others to combine to make us the best teacher possible." Another theme common to several responses was the idea that teaming helped teachers to know more about what was going on in other teachers' classrooms, other grade levels or in other subjects area and helped them to better understand their role in the big picture of the school learning community.

Many beginning teachers identified themselves as first or second year teachers through the open-response questions. Without exception, those who indicated that they were in their first year or second year of teaching related positive experiences with teaming, for example, "As a new teacher, collaborating with other teachers in my grade has helped me to be a better teacher." That said, the focus of their responses was on how teaming helped them with their teaching without making a connection between teaming and student learning.

A moderate number of respondents voluntarily used the term "professional learning community" in their answers. Both of the pilot groups who previewed the survey instrument felt uncomfortable with this terminology and indicated that the majority of teachers would not know what this term meant. It was evident that this is not really the case. Several respondents appeared to be making the connection between their teamwork and collaborative activities and the professional learning community in their schools without any prompting or insinuation from the instrument that they should be viewing their teamwork in professional learning community terms.

Summary of Findings

This chapter has presented the findings that addressed the three research questions driving this research study on collaboration and teamwork in schools where the principal is a member of the BYU Principals Academy. Confirmatory and exploratory factor analysis revealed the presence of one factor for the attitudes questions and two factors for the experience questions that were measured by the survey. One-way ANOVA tests were performed between the means for the identified variables and the different cohorts. Significant differences were found in the case of the derived variable *Experiences*. Subsequent analysis using Fisher's post-hoc test indicated that these differences occurred between the 2002 cohort and the 2003 cohort and between the control group and all of the other cohorts with the exception of the 2003 cohort. ANOVA tests for the individual experience questions produced significant differences in seven cases.

The content analysis performed on the responses to the open-ended questions showed marked patterns in terms of how teachers collaborate, how the principal promotes teamwork and collaboration, and how teamwork and collaboration have affected their

teaching practice. Further, the general trend was for teachers to report details of their

collaborative activities in exclusively positive or negative term with no middle ground.

CHAPTER FIVE

DISCUSSION

The purpose of this research study was to examine the extent to which the sustained development of school principals affects the attitudes and experiences of teachers with collaboration and teamwork in schools. To that end, data were generated through a survey questionnaire and were analyzed using factor analysis, one-way ANOVA tests and themes based content analysis. This chapter includes a discussion of the findings and how well they answer the research questions guiding this study, a list of recommendations, a summary of some of the problems encountered during the study, and some suggestions for future research in this area.

Findings in Regard to the Research Questions

I analyzed and interpreted the data in order to meet the demands of the three research questions set out at the beginning of this study. The first question that addressed the dimensionality of derived variables from the survey instrument was answered by using exploratory and confirmatory factor analysis. The derived variables were found to be multidimensional and the variables that were originally intended were broken down into several smaller variables.

The primary research question focused on the extent to which differences in attitudes about teamwork and experiences with teamwork and collaboration existed between cohorts. Multiple significant differences were located between the mean for the control group and the means for four of the other five cohorts as well as between the means for the 2002 cohort and the 2003 cohort, demonstrating that any exposure to the

Principals Academy might have a positive effect on teachers' experiences with teamwork in schools.

Question three was related to the data from the open-ended questions on the survey and concerned factors that motivate teachers to participate in collaborative activities. Time was a key factor as well as the right type of support from principal.

Question One: Identification of Survey Variables

The first of three research questions driving this project concerned the extent to which the aggregated survey items were unidimensional measures of teachers' attitudes and experiences with teamwork and collaboration. This question was a necessary precursor to all other statistical analysis of the data because it established whether the survey was measuring two variables, Attitudes and Experiences, or if other variables should be considered.

While the exploratory factor analysis indicated the presence of several variables within the aggregated measures from the Attitudes and Experiences questions, the confirmatory factor analysis allowed the development of two models that illustrated the different survey questions that contributed or "loaded" onto each derived variable. Only those variables indicated by the factor analysis as fitting the models well were used in the subsequent ANOVA analysis. Given that the initial aggregated attitudes variable yielded one derived variable, Attitudes about Teamwork, and the initial aggregated experiences variable produced two derived variables, Experiences with Teamwork and Experiences with Collaboration, the factor analysis proved to be an extremely valuable undertaking in examining the dimensionality of these variables. Further, the development and testing of different structural equation models via confirmatory factor analysis proved to be a solid

initial approach to the data because it went beyond the scope of classical linear models, such as analysis of variance, and also handled possible measurement error (Raykov & Marcoulides, 2006).

The factor analysis established conclusively that the original variables were multidimensional and, therefore, it would have been a gross misstep in the research process to use the aggregated variables that were initially proposed without prior investigation of their dimensionality. By breaking the original variables down into a number of other variables and removing questions 11a and 11b from the data set, it was possible to see patterns and connections within the survey. Early drafts of the survey questionnaire were divided into different sections with subheadings to ensure adequate coverage of all relevant topics. However, although the subheadings were removed after pilot testing was complete, it was not surprising that the new variables that were indicated by the exploratory factor analysis tended to loosely follow the original subheadings. For example, questions 5a and 6a on the survey both address decision-making and both loaded well onto a second component (although after additional testing of the model, this variable did not appear in the final Attitudes model, shown in figure 2). Further, questions 12b, 13b, and 14b, which all address collaboration, loaded onto a separate component as shown in the final Experiences model (figure 3).

Question Two: Groups Differences on the Survey

The second and primary research question motivating this study concerned the extent to which differences exist in teachers' attitudes and experiences with teamwork where the principal has successive years of involvement in the BYU Principals Academy. This question focuses on teachers' attitudes about and actual experiences with teamwork

and collaboration in their schools. While the *Attitudes about Teamwork* and *Experiences with Collaboration* variables failed to display significant differences, the ANOVA test for the derived variable *Experiences with Teamwork* illustrated that significant differences were apparent between several cohorts.

Performance of Groups

With the exception of the 2003 cohort, all of the other cohorts (the 2002, 2004, 2005 and 2006 cohorts) had means that were significantly higher than the control group. The mean for the 2002 cohort was significantly higher than the 2003 cohort and also the 2004 cohort.

The contrast between the 2002 cohort and the control group is particularly distinct because these groups represent polar opposites in this study. Because the 2002 cohort was comprised of teachers from schools where the principal had been a member of the Principals Academy from its inception in the fall of 2002, it is perhaps unsurprising to find that this cohort is significantly higher from the control group that had had no exposure to the Academy. In this case, it appears that successive years of involvement or in other words, longevity or persistence, in the Principals Academy may have contributed to the positive teaming and collaborative experiences reported by teachers in the 2002 cohort.

While it is not possible to imply a direct causal link between the length of a principal's membership in the Academy and positive team experiences reported by teachers from their school, it would be fair to say that given the significant differences between the 2002 cohort and the control group, that the sustained preparation of principals in the 2002 cohort may well be a factor which could explain a portion of this

difference. Future researchers in this area will face the task of discovering what, if

anything, was different, unique, or special about the 2002 cohort. Given that 2002 was

the inaugural year of the BYU Principals Academy, the resource base may have been

different or perhaps there was something tangibly different about the preparation or

experience of principals who were selected to participate during the foundational year. In

addition, sheer longevity of exposure to the collegiality, socialization, dialogue,

resources, experiences, and opportunities provided by the Academy might have prepared

the 2002 cohort principals to nurture and sustain effective teamwork and collaboration

through professional learning communities in their schools.

Another significant difference was located between the 2002 and the 2003

cohorts, where the mean for the 2002 cohort was significantly higher. This difference was

more difficult to explain as the 2002 cohort had only had 12 months more exposure to the

academy than the 2003 cohort. In an attempt to understand this difference, further one-

way ANOVA tests were performed using gender, school district, and years of teaching

experience as the dependent variables to ascertain if any of these factors were

contributing to the difference. No significant differences were found, although, this

process did reveal one unique characteristic of the 2003 cohort. That is, the 2003 cohort

was the only group that had representation from Carbon County School District. All of

the other cohorts included only teachers from the five BYU-Public School Partnership

schools.

Although no significant differences were found for gender, school district, and

years of experiences, when the data for respondents from Carbon District were collated, it

was noted that the average experience score for Carbon was much lower than the other

five school districts. Clearly, the small number of teachers in Carbon district who participated in the study were reporting fewer collaborative experiences, less positive team environments, and lower levels of support for collaboration than teachers in other districts. This was not a surprising result because Carbon is a small rural school district that has experienced some challenges in recent years, particularly regarding leadership and was recently identified as a district in need of improvement under criteria set out by the No Child Left Behind Act of 2001 (Wilson, 2007).

The fact that the mean for the control group was found to be significantly lower than the means for the 2002, 2004, 2005, and 2006 cohorts is a finding that directly addresses the effect of sustained principal development on the development and maintenance of collaborative activities in schools. Teachers in schools where the principal had had no exposure to the Principals Academy reported significantly lower experiences with teamwork than the four cohorts listed above. Exposure to the sustained preparation provided by the Academy, whether for five years or for one year, translates into teachers reporting significantly higher (positive) experiences with teamwork in their school environments than teachers in the control group.

Characteristics of Groups that Didn't Fit the Model

Since some groups displayed more differences and anomalies than others, those groups merit a more detailed discussion. Specifically, the 2002 cohort, the 2003 cohort and the control group displayed distinctive characteristics that may help to explain a portion of the differences that were identified.

The 2002 cohort. The characteristics of the 2002 cohort are such that it appears to be somewhat anomalous in comparison to the other cohorts. The 2002 cohort did not

include any high school principals. The general differences between the culture of primary schools and secondary schools might have played a role in the significance that was discovered through the ANOVA tests. For example, elementary schools generally have fewer pupils than secondary schools and, therefore, fewer teachers. Smaller team structures characteristic of the grade level teams described by teachers from elementary schools may well be more conducive to the development of collaborative environments in schools than larger subject or departmental teams often found in high schools. Further, statistics from the National Center for Education Statistics indicate that a much higher percentage of teachers in elementary schools are female (85.1%) than in secondary schools (55%) (N.C.E.S., 2007) and perhaps female teachers are more inclined to engage in teamwork and collaborate with their professional peers than their male counterparts? However, the 2002 cohort did include one junior high school principal and one middle school principal which meant that the cohort was not entirely lacking secondary school characteristics, but teachers at neither of these schools could not be included in the sample because e-mail addresses were not available on school websites.

Further investigation of the characteristics of the 2002 cohort revealed that five of the principals in the 2002 cohort served as members of the steering committee that was set up in 2001 to investigate the idea of starting a Principals Academy. Their experiences in helping to set up the Principals Academy must have been positive because all five principals decided to participate in the Academy during its first year. As a result of this, it could well be that this core of five principals who were involved in the steering committee, offered a heightened level of peer modeling or influencing, or in other words, a "cohort effect" in the 2002 cohort that was not apparent in other cohorts.

Another factor that may have been at work in the 2002 cohort because it was the first cohort in the Principals Academy is increased synchronicity. Several researchers in this field (Faber, 1998; Main, 2004) have noted that when participants in an activity have faith that a synchronicity will occur, there is increased probability that paranormal events will take place. This pattern is often particularly pronounced at the beginning of activities, such as the beginning of the Principals Academy.

Additionally, the potential for bias in this cohort is apparent because teachers from schools where principals who enjoyed the Principals Academy experience and stayed connected with their cohort were included in the sample, while those who did not like what they were doing might have exited the teaching profession and, therefore, teachers from their schools could not be included in the sample.

The 2003 cohort. The most distinctive characteristic of the 2003 cohort was the presence of teachers from a rural school district outside of the BYU Public School Partnership area. The 2003 cohort was also the first cohort to include high school principals as well as elementary and junior high/middle school principals. Given that the culture of high schools is generally very different to that of elementary schools, and that this rural school district has been plagued by problems and turmoil in recent years, it is perhaps not surprising to find the contrasts and significant difference that were apparent between the 2002 and 2003 cohorts may be due to the "district effect" created by the addition of teachers from this particular district.

The control group. Because the control group included teachers from schools where the principals had no prior experience of the Principals Academy, it was not surprising to find that this group exhibited the lowest means scores for *Experiences* with

teamwork and collaboration. The significant differences found between the means of the control group and the 2002, 2004, 2005, and 2006 cohorts might have been caused by an "exposure effect," or rather a lack of exposure by the control group to collaboration in the work place. As the control group was significantly lower than four of the other five cohorts, it seems reasonable to infer that exposure to the academy by school principals, however brief, does have a positive affect the self-reported experiences of their teachers with teamwork.

Responses to the open-ended questions from the control group used the term "professional learning community" less frequently than other cohorts. This could indicate a lack of familiarity with professional learning communities or perhaps merely a lack of familiarity with the terminology, but not with the concept itself. Because the use of the professional learning community terminology was an issue that was raised by the two pilot groups, further research would be required to probe more deeply into teachers' familiarity with different terminology and conceptual ideas, to find out if this was truly a factor in this case.

Performance in Light of Predictions

Not all of the groups performed as anticipated based on the original model for the research study. A number of discrepancies were identified between the predicted and actual performance of the groups with regard to the individual survey questions. In addition, differences between teachers' attitudes and experiences were also revealed by the survey data.

Discrepancies in group responses to individual questions. In an effort to better understand the derived variable, *Experiences with Teamwork,* each of the 10 Likert scale

questions that made up this variable were analyzed using ANOVA and some interesting conditions were revealed. In each case where a significant difference was found, the 2002 cohort was involved with either the 2003 cohort or the control group at the opposite end of the spectrum. For example, means for teachers in the 2002 cohort were significantly higher because they reported positively that teaming and collaboration at their schools was focused on teaching, learning, and assessment, while in the control group, this does not appear to be the case. A similar scenario is true for question 10b, which asked about appropriate administrative support for teacher collaboration. Once again, teachers in the 2002 cohort, for the most part, reported that there was appropriate administrative support for collaboration in their school, while the control group reported the opposite.

Such stark contrasts between the oldest Academy cohort and the control group are indicative of different experiences for teachers. While no significant differences were detected between school districts, it remains to be seen whether district-wide initiatives, such as Alpine district's current program to promote professional learning communities in their schools, will have a positive and pronounced effect on teachers' experiences with teamwork and collaboration.

Discrepancies between attitudes and experiences. One aspect of the data that provided an interesting tangent to the statistical analyses was the differences between the attitudes and experiences of teachers in schools where the principal is a member of the Academy. Difference scores were calculated by summing Likert responses to all of the "a" questions and subtracting the sum of the Likert responses to all "b" questions. Overall, with the exception of four respondents who achieved a difference score of zero, everyone showed a difference between their attitude and experience scores. While a

handful had negative difference scores, the vast majority of participants had positive difference scores. Ideally, if the majority had difference scores approaching zero, then it would seem logical to assume that teachers' attitudes and perceptions about teamwork and collaboration were closely aligned with their actual experiences with teamwork and collaboration. But, because the majority of teachers reported experience scores that were lower, to varying degrees, than their attitude scores, a mismatch or disconnect clearly exists between theory and practice in this area, and it appears that their attitudes generally develop in advance of their experiences..

The wide variety in the difference scores actively demonstrates that teachers are experiencing their work place and their leadership in different ways. While one teacher may have a high expectation for collaborative work that is never met, another may prefer to work alone. While one teacher may flourish in a collaborative work environment, another may feel uncomfortable and even isolated. While one teacher may welcome changes initiated by the principal, another may prefer things the way they were. Such is the great diversity of experiences reported by teachers that is reinforced by DuFour and Eaker's (1998) research on common barriers to successful implementation of professional learning communities.

Question Three: Analysis of Open Response Data

The open response data was revealing in terms of what was included and what was omitted and was used to answer the third research question for this study. For example, when teachers were asked to list the ways they collaborate with teachers at work (question 2), they focused overwhelmingly on factors that contributed to their own work life as teachers, such as sharing ideas and materials and "know-how" connected

with getting through the school day. Relatively few teachers made a strong connection between the teaming and collaborative activities they were involved with and the learning of their students. Their comments gravitated around the idea that teamwork and collaboration tend to make their every day work in the classroom easier. Little's (2003) research corroborated this idea as she reported that while teachers may meet together for many different reasons, it is rare that the focus is on student learning.

In addition, a large number of teachers reported that they collaborated or worked in teams on specific projects or tasks such as balanced literacy, the curriculum or field trips. This piecemeal approach to teaming on a set of clearly defined activities conflicts with Sparks (2004) idea that meaningful collaboration and teaming could only occur when collaborative cultures were established. While many of the teachers who responded to the survey were experiencing collaborative moments, it does not appear that many were being immersed in truly collaborative school cultures that followed Little's (2003) model on student learning.

Because congeniality, camaraderie, collegiality, and collaboration are terms that are often used interchangeably and frequently in the professional learning community literature (Leithwood, 1990), it was difficult to know what the differences were among these four terms when teachers used them in their responses. This research study identified a need to characterize the difference between these terms and to pin down their use in this context. While the teachers appeared to use these terms interchangeably in their responses, the content analysis indicated a focus on congeniality and camaraderie and other aspects of being a good neighbor teachers and feeling good about ones

professional peers, rather than on meaningful collegiality and collaborative activities that enhanced student learning in the classroom.

Although teachers reported many positive experiences about the teams they participated in at work, this research study did not probe deeply enough to examine the concept of "*Group IQ.*" DuFour (1999, p. 2) pointed out that schools make a major mistake when they settle for creating team structures alone. Even if teachers report that they enjoy teamwork and find it useful, the real challenge is developing teams with high "group IQ," "teams that are effective in working together to solve problems and renew the school." Schools must work towards the development of high functioning teams and focus more closely on their effect on learning as well as teaching.

When teachers were asked how their principal promoted teaming and collaboration in their schools (question 3), they offered several different responses including release days (where pupils are not in school and teachers have time for professional development) and "early outs" (where pupils are dismissed from school earlier than usual to allow time for professional development). However, this question did not provoke responses that dealt with the more spontaneous, unpredictable and voluntary aspects of collaboration in schools (Hargreaves, 1994) and focused exclusively on formal, often prescriptive initiatives promoted by their leaders. The addition of another question that addressed the more spontaneous aspects of principal support for teaming in schools might have drawn out these experiences.

In question 4, teachers were asked to explain how teaming and collaboration had affected their professional practice. Judging by the mixed responses this question received, both privacy and isolation remain formidable forces within the teaching

profession. The list of negative effects of teamwork and collaboration that was collated

appeared to cover all four counterfeits of collaboration described by Fullan (1996),

particularly cooption by school leaders. That said, there were multiple positive responses

to this question that focused on greater unity and connection among teachers, being more

aware of individual student needs, and more professional communication between

teachers. A number of participants chose to couch their responses in professional learning

community terms, thus demonstrating their familiarity with these terms and their

understanding of this phenomenon.

The analysis of the open response questions on the survey revealed a scenario that

appeared more focused on collaboration for survival and getting through the school day,

rather than the realization of DuFour's (2004, p. 8) notion of "collaborating for school

improvement." This was a little surprising given the careful phraseology of the survey

questions that covered teaching, learning, and assessment with the intent of eliciting

information on these topics. Participants who identified themselves as first year teachers

demonstrated a strong focus on teaming connected to teaching outcomes rather than on

teaming connected to student learning outcomes. This focus on survival and getting

through each school day was echoed by Wilke (2003) in her guide for beginning teachers

as she commented on the importance of professional colleagues on their career, but

omitted to discuss the effect of professional collaboration on student learning.

In addition, it was apparent that some teachers equated collaboration with

congeniality and camaraderie. While congeniality and camaraderie are important

ingredients in professional learning communities in schools, they do not represent an

appropriate focus on meaningful collaboration that can unlock the door that leads to the

type of powerful collaboration necessary to build and sustain professional learning communities.

Problems Encountered in Conducting the Research

One problem that might affect the validity of the study and, in turn, the generalizability of the findings, is that the 2002 cohort had the highest rate of attrition of any cohort. Teachers from only four schools where the principal who joined the Academy in 2002 were included in the study because the majority had either moved to a different school district, were on assignment in the district office, or were no longer working. Perhaps this indicates that the responses of a handful of principals and their teachers have effectively been amplified to represent the views of the whole cohort. Further, turnover in general was a problem as in each cohort there were several principals who had begun their training with the Principals Academy, and then dropped out so teachers from their schools could not be included in the study.

The low response rate for the survey also presents a potential problem for the generalizability of the findings. With only 25% of those who were invited to participate actually completing the survey, there is the distinct possibility that those who did respond to the survey may not be representative of the target population. It is possible that teachers who held strong feelings about teamwork (either positive or negative) completed the survey, while those who were ambivalent or who had little interest in this topic ignored it. Response rates for future surveys that are similar in nature could benefit from the use of strategies to eliminate non-response such as offering an incentive to those who complete the survey and working more closely with school principals to encourage them to endorse the survey to their teachers.

While the stated response rate goal of 60% was not achieved overall or for any of the individual cohorts, given the relative difficulty in accessing teachers e-mail addresses, gaining approval from school districts and from each individual building principal to send the survey to their teachers, the actual response rate of 25% was not surprising. That said, a handful of principals responded enthusiastically to my request for permission to survey teachers at their school and mentioned that they would actively encourage their teachers to complete the survey. Further, four teachers wrote extensive responses to the open-ended question and then followed up with an e-mail inviting me to come and observe teamwork and collaboration in action at their school.

Because it was impossible to identify non-responders, it is possible that non-response bias might have occurred. Teachers who have had positive experiences with teamwork and teachers who have had negative experiences with teamwork might well have had a greater inclination to participate in the survey than teachers who had had little experience with teamwork or a more neutral experience. Additionally, teachers in schools where the principal did not endorse the survey might have participated in lower numbers than in schools where the principal encouraged their staff to respond. That said, there was no evidence to suggest that non-responding teachers were different from responding teachers.

However, identifying who had responded to the survey would have allowed a targeted approach to reminder e-mails and might have been more effective. However, because of the sensitive nature of teachers' experiences with teamwork, far fewer teachers might have participated if they had known their individual responses were not anonymous.

Future researchers in this area should also be aware of the strict controls exercised by individual school districts over those who wish to disseminate surveys, the time consuming nature of multiple research applications and, the requirement for a monetary deposit with a district before research could begin. In addition, the general difficulty with gathering information beyond that which is already available in the public domain through school and district websites should not be overlooked. By conducting research in a single large school district it might be possible to avoid or bypass a number of these obstacles by gaining crucial buy-in from school district administrators, without eliminating vital diversity in the target population.

<div align="center">Recommendations and Suggestions for Future Research</div>

Based upon the data and findings reported in Chapter Four and the subsequent discussion of those findings in this chapter, several recommendations are offered. From the quantitative analysis it is apparent that

1. Principals in the 2002 cohort should be interviewed to document details of their unique experiences in the first year of the Principals Academy. Depending on available resources, it might well be beneficial for the CITES office to conduct structured interviews with a sample of principals from the Academy each year in order to chart changes in development and experience over time.

2. If resources are available, the Principals Academy experience should be extended to include more principals, perhaps the addition of a second cohort each year, in order to impact the teamwork and collaborative activities of many more teachers than at present.

From the content analysis it is apparent that

1. Principals would do well to conduct ongoing observations and informal research within their own schools to ascertain whether the experiences of their teachers with teamwork and collaboration are positive. Principals need to explore strategies for improvement in this area.

2. Principals need to consider stretching their support for teaming and collaborative activities in their schools to go beyond simply the provision of time for teamwork and occasional monitoring, which can be misperceived by teachers as spying. Principals also need to be careful not to co-opt teachers into teamwork and related activities. In addition to time, teachers need training on how they can best work as teams, motivation to participate in teams and good examples of teamwork and collaboration combined with sensitive, consistent monitoring and guidance.

3. Because there was more or less a general consensus among teachers that teamwork in schools was a good thing, principals should focus their efforts on promoting teamwork, whether spontaneous or planned in their school.

Given the findings of this research study, there are a number of avenues for further research in this area:

1. Conduct similar studies using the other elements of professional learning communities as the focus. Shared vision, collective inquiry, collaborative culture, and respect are all characteristics of professional learning communities that are well suited to a similar type of analysis.

2. Examine how teamwork and collaboration among teachers varies between elementary teachers and secondary teachers. Because many teachers reported that their approach to collaboration was characterized by team meetings in grade levels or departmental groups, contrasting the collaborative activities of primary and secondary teachers may offer an opportunity for productive inquiry and research in the future.

3. Perform a longitudinal study, over a period of five years or more, to chart the progress of a single Principals Academy cohort from its first meeting with the group to the point where the institutionalization process is well established.

4. Study the teamwork and collaborative activities of beginning teachers. Because many teachers identified themselves as first year teachers in their open response answers and indicated that being new to teaching meant that they had relied upon and gained a great deal from collegial interaction and collaboration in the work place, they could be studied, perhaps using journals or diaries to record how their teaming activities and experiences over time as they evolve into experienced teachers.

5. Explore what kinds of changes occur in teachers when principals do not engage in sustained professional development experiences like the Principals Academy.

Conclusion

This research study addressed three important research questions and contributed to the growing field of research and scholarship on the characteristics of professional learning communities in schools. Overall, it was apparent that evidence of the extent to

which sustained principal development affected the development and maintenance of collaborative activities in schools was limited. However, the results of the ANOVA analysis, in particular the finding that four of the five Principals Academy cohorts had significantly higher means than the control group, provides a promising foundation for further research in this area.

When subjected to exploratory and confirmatory factor analysis, the survey was found to be multidimensional as it was measuring several different dimensions connected with teachers' attitudes and experiences with teamwork and collaboration in schools. This meant that measures derived from the survey could not be used in exactly the way that was initially intended. However, these measures were reconfigured to reflect the factor analysis and this process added clarity and reliability to the instrument.

A synthesis of the quantitative analysis offers the most comprehensive illustration of the findings. While the ANOVA analysis facilitated the location of significant differences between cohort means, the content analysis added clarity and understanding to those significant differences by providing real reasons why teachers collaborate in the schools. I was also able to refer to comments made by teachers in particular cohorts to explain some of the reasons why differences in the means might have occurred.

Somewhat unsurprisingly, for *Experiences with Teamwork*, the 2002 cohort, where the principals had had five years of exposure to the Academy and plenty of time to implement what they learned in real school settings, was significantly different from the control group. The contrast between the 2002 cohort and the control group represented the most distinct comparison between all of the cohorts. The control group also exhibited the lowest average scores for *Experiences with Teamwork* of all of the groups. The 2003

cohort was also found to be significantly different from the 2002 cohort in terms of teachers' experiences with teamwork. Various factors were identified to explain a portion of this difference including the presence of principals from Carbon School District in the cohort.

The open response data tended to reinforce the Likert data by providing reasons why teachers collaborate and how principals support their teachers in this effort. It was evident from responses to the open-ended questions on the survey, that in order to successfully lead teachers towards collaborative practices, principals need more than just the sustained preparation experience provided by the Principals Academy. They need time to assimilate, to operationalize, to listen and, ultimately to institutionalize new ideas through the entire school culture. The teachers who responded to the survey have some clear ideas about the types of approach that were most acceptable to them in this area.

Turnover of teachers is likely to continue to be a problem as it represents a loss of developed networks as teachers exit carefully nurtured professional learning community settings each year. The study of the effects of sustained principal development on professional learning communities in schools will undoubtedly continue to be somewhat problematic as long as administrators who receive training and development opportunities continue to turnover and their potential effect and influence on teachers is lost from the system. Principals who received some or all of the training experiences provided by the Academy and then moved to the district office, to the private sector, or retired are incapable of having a direct, measurable effect on teachers and the learning of their students. That said, because teachers' experiences with teamwork and collaboration in four of the five cohorts were significantly different from the control group, is

indicative of a situation where any exposure of the principal to the Academy positively impacts teachers in their schools.

While teachers offered many different comments about how teamwork and collaboration had impacted their teaching, convincing evidence of the impact of collaborative activities on learning and assessment was lacking. Few teachers made a connection between their experiences with teamwork and student learning in the open-response section.

The most thought provoking finding of this study, however, is the fact that the mean for the control group was significantly lower than the means for the 2002, 2004, 2005, and 2006 cohorts for *Experiences with Teamwork*. Clearly, exposure by the school principal to the Academy translates into teachers self-reporting more positive experiences with teamwork in their schools. This study has shown that any initiatives, however brief, that promote the development and maintenance of collaborative activities in schools, might be beneficial if they assist teachers with their daily work by helping to make collaboration and collegiality the norm, rather than privacy and isolation.

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APPENDICES

APPENDIX A

Survey Questionnaire Instrument (Online)

Directions
Section One contains 14 paired questions that require a response based on a scale of strongly agree to strongly disagree. In each pair, the first question is concerned with your *attitudes* and the second question is concerned with your actual *experiences*.

1

Please answer every question.

7	6	5	4	3	2	1
Strongly Agree	Agree	Somewhat Agree	Neither Agree Nor Disagree	Somewhat Disagree	Disagree	Strongly Disagree

(1a) The work of teachers should involve teaming and collaboration that is focused on teaching, learning, and assessment.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(1b) In my school, the work of teachers involves teaming and collaboration that is focused on teaching, learning, and assessment.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(2a) Schools that operate as professional learning communities encourage teachers to be more collaborative in their work.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(2b) My school operates as a professional learning community, which encourages teachers to be collaborative in their work.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(3a) Professional learning communities in schools are an effective method of promoting collaboration and teaming among teachers.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(3b) In my school, the professional learning community is an effective method of promoting collaboration and teaming among teachers.

[7]　[6]　[5]　[4]　[3]　[2]　[1]

(4a) Teaching should be more about cooperation and teaming than about competition and individualism.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(4b) In my school, teaching is more about cooperation and teaming than it is about competition and individualism.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(5a) Schools should be characterized by high levels of teacher participation in decision-making.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(5b) In my school, decision-making is characterized by high levels of teacher participation.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(6a) Administrators should involve teachers when making decisions about issues related to teaching, learning, and assessment.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(6b) In my school, administrators involve me when making decisions about issues related to teaching, learning and assessment.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(7a) Teachers need sufficient time to work together through teaming and collaboration.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(7b) Teachers in my school have enough time to work together through teaming and collaboration.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(8a) Frequent professional collaboration is an appropriate use of teachers' time.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(8b) In my school, frequent professional collaboration is an appropriate use of teachers' time.

| 7 | 6 | 5 | 4 | 3 | 2 | 1 |

(9a) Teachers should collaborate because it improves their teaching.

7   6   5   4   3   2   1

(9b) Teachers in my school collaborate because it improves their teaching.

7   6   5   4   3   2   1

(10a) Effective teacher collaboration requires appropriate administrative support.

7   6   5   4   3   2   1

(10b) There is appropriate administrative support in my school for effective teacher collaboration.

7   6   5   4   3   2   1

(11a) Teachers should receive professional development credit for team participation.

7   6   5   4   3   2   1

(11b) In my school, teachers receive professional development credit for team participation.

7   6   5   4   3   2   1

(12a) Teachers should be motivated to collaborate because of heir responsibility for all students' learning.

7   6   5   4   3   2   1

(12b) Teachers in my school are motivated to collaborate because of their shared responsibility for all students' learning.

7   6   5   4   3   2   1

(13a) Teachers should collaborate with other teachers in their school across curriculum and/or grade levels to discuss teaching, learning, and assessment.

7   6   5   4   3   2   1

(13b) In my school, teachers collaborate across curriculum and/or grade levels to discuss teaching, learning, and assessment.

7   6   5   4   3   2   1

(14a) Teachers should collaborate with teachers from other schools.

7   6   5   4   3   2   1

(14b) In my school, teachers collaborate with teachers from other schools.

7   6   5   4   3   2   1

SUBMIT

Directions

Section Two provides 3 questions with the opportunity for open responses. Please type your

answer in the space provided.

2

Please list the different ways you team and collaborate with other teachers at work.

_____

3

Please explain what your principal does to promote teaming and collaboration at your school.

_____

4

Please explain how collaboration and teaming in your school have affected your professional practice.

SUBMIT

Directions

Section Three requires a response to 8 questions requesting demographic information.

5

Please indicate your gender.

◯ Male

◯ Female

6

Please indicate whether you are a teacher or an administrator.

◯ Teacher

◯ Administrator

7

How many years of full-time teaching and/or administrative experience do you have?

8

How many years have you worked at your current school?

9

For Elementary School Teachers: Please indicate the grade level you teach.

10

For Secondary School Teachers: Please indicate the subject you teach.

11

Please provide the name of your school.

12

Please provide the name of your district.

Thank you for your participation.

SUBMIT

APPENDIX B

Survey Recruitment E-Mails

Initial Recruitment E-Mail

Dear Educator:

My name Sarah Westerberg and I am a PhD candidate at Brigham Young University. As part of my dissertation research, under the direction of Dr Joe Matthews, I am studying the effects of sustained principal development on collaborative activities in schools. You were selected for participation in this study because your building principal is currently a member of the BYU Principals Academy. I invite you to participate in a short online survey to share you attitudes and experiences about teamwork and collaborative activities. The dissemination of this survey has been approved by your school district.

Your participation in this survey is very important and greatly appreciated. The results of this survey may be of value to scholars and practitioners in schools in Utah and beyond.

The survey may be accessed at the url link below. The survey should take less than 15 minutes to complete. Please be assured that all survey responses will be kept strictly confidential.

Please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

Sarah Westerberg
PhD Candidate
Brigham Young University
sarah_westerberg@byu.edu

Here is the link to the survey:
http://www.zoomerang.com/survey.zgi?p=WEB2262TFCD9B3

APPENDIX B

Survey Recruitment E-Mails

Reminder E-Mail

Dear Educator:

My name Sarah Westerberg and I am a PhD candidate at Brigham Young University. I recently sent you an e-mail inviting you to participate in a short online survey about teamwork and collaborative activities in school.

Please accept my thanks if you have already completed the survey and disregard this e-mail. If you have not yet completed the survey, I would greatly appreciate your assistance with this. The survey may be accessed at the url link below and should take 10 minutes to complete. Please be assured that all survey responses will be kept strictly confidential.

Please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

Sarah Westerberg
PhD Candidate
Brigham Young University
sarah_westerberg@byu.edu

Here is the link to the survey:
http://www.zoomerang.com/survey.zgi?p=WEB2262TFCD9B3

APPENDIX C

Informed Consent for Survey Participants (Online)

Consent to be a Research Subject

Introduction

This research study is being conducted by Sarah Westerberg, a doctoral student at Brigham Young University. The purpose of the study is to examine the effects of sustained principal development on collaboration and teaming in schools.

Procedures

You are being asked to complete this survey because you are a teacher or an administrator in either Alpine, Carbon, Jordan, Nebo, Provo or Wasatch school districts. This survey is related to teamwork, collaborative activities and professional learning communities. If you consent to participate you will take a 39 question survey. Questions will include information related to attitudes and behaviors towards teamwork and collaboration at your school as well as some demographic information. The survey typically takes no more than 15 minutes to complete.

Risks/Discomforts

There is minimal risk associated with participation in this study. However, there is a small chance that you will feel some discomfort answering questions about personal attitudes and experiences.

Benefits

There are no direct benefits to participants in this study. However, it is hoped that this study will contribute to the improvement of teamwork and collaborative activities in schools. This study may also lead to a better understanding of collaborative between teachers, particularly in professional learning community settings.

Confidentiality

All responses will be anonymous and will be reported only as group data with any identifying information removed from your responses. Survey data will be kept as an electronic file and at the conclusion of the study, all participant response data will be deleted.

Participation

Participation in this research study is voluntary. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy to your employment, relationship with the Brigham Young University, etc.

Questions about the Research

If you have questions about this study, you may contact Sarah Westerberg at (801) 422-2130, or sarah_westerberg@byu.edu or Dr Joe Matthews, the faculty advisor for this study, at (801) 422-6388 or joe_matthews@byu.edu.

Questions about your Rights as Research Participants

If you have questions you do not feel comfortable asking the researcher, you may contact Dr.

Renea Beckstrand, IRB Chair, 422-3873, 422 SWKT, renea_beckstrand@byu.edu.

By clicking the "SUBMIT" button below, you are indicating that you have read and understood this electronic consent form and desire of your own free will and volition to participate in this study.

APPENDIX E

Survey Questionnaire Evaluation Form – Pilot (Hard Copy)

Thank you for your willingness to participate in the pilot evaluation of the attached survey questionnaire.

Please choose the most correct answer for each of the following items:

1. I completed the survey in:
   - ❑ Less than 5 minutes
   - ❑ 5 to 10 minutes
   - ❑ 10 to 15 minutes
   - ❑ More than 15 minutes

2. When I read the instructions, I felt they were:
   - ❑ Clear, easy to understand and follow
   - ❑ Too wordy, but could be followed
   - ❑ Confusing, hard to understand and follow
   - ❑ Other _____

3. Please enter changes you would make to those questions found to be unclear.

4. Please list the number of any items that you feel should be deleted from the survey.

5. Please suggest any questions on the topic of teamwork and collaboration in schools that should be added to the survey.

Thank you for your participation.

APPENDIX E

Survey Questionnaire Evaluation Form – Pilot (Online)

Thank you for your willingness to take this survey. Please type in the URL below to access the survey:
http://www.zoomerang.com/survey.zgi?p=WEB225S2CAZM8R

Please follow the instructions and complete the survey. If you find that a question is poorly worded, unclear, needs more clarification, does not make sense, etc, please indicate this in the space provide below. I am interested in any feedback or comments you may have for me about the survey so I can made refinements and adjustments.

Question Number	*Feedback/Comments*

Thank you for your participation.