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Distributed Leadership and Social Networks in the school-based development of the International Baccalaureate's Middle Years Program in a Venezuelan K-12

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by

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The Dissertation of Jose M. Bolivar is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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2009

DEDICATION

To my wife, Romina, who through her love and support
makes me fly and keeps me grounded.

To my grandparents, José Isabel, Dimas José and Leny Victoria, who set the moral and intellectual foundation for generations to build upon.

To my parents, Jorge Luis y Virginia, who lovingly taught me with their words and actions about the universal value of persistence and excellence.

To my brothers, Chubeto and Eduardo, and my sister, Leny Virginia, who inspire me everyday and for whom I strive to be a better person.

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ABSTRACT OF THE DISSERTATION

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by

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Doctor of Education in Educational Leadership

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2009

Deep and careful analysis of the collective work of teachers and school administrators as they embark on the development of innovative instructional programs, such as the International Baccalaureate's Middle Years Program (MYP), is essential to building models for 21st century education. Two theoretical frameworks, distributed leadership and social networks, have emerged in the educational research literature that as integrated by this study present leadership for school-based change and innovation efforts in terms of actions related to the school's central mission and emphasize the importance of social interactions for their enactment. This exploratory case study draws upon its integration of these theories to describe and understand leadership in action

during the school-based design and early implementation of the MYP curricular master plan as well as the social networks underlying enactment of leadership actions. The study presents findings on two levels: educational theory and educational practice. In terms of theory, the study proposes that leadership tasks for the school-based development of academic programs are classified as curriculum design tasks and teacher support tasks. These tasks take on distinct social distributions that respond to the nature of the task and contextual factors explored in the study that influence its enactment. It is further proposed that integration of social network theory into its framework reshapes the distributed leadership model in two ways: it asserts the multiplicity of actors involved in leadership actions thus making the leader-plus aspect an unnecessary category in and of itself and it becomes the driving method for measuring and lens for understanding the social distribution of leadership tasks. On a practical level, the study highlights (1) the importance of coherence-building, collaborative design task for a systemic instructional vision, (2) the critical role of teacher support tasks that provide key resources for the successful enactment of design tasks, (3) the promotion of certain school- and team-level conditions that support collaborative processes, and (4) the existence of certain school- and team-level conditions that constrain teacher collaboration.

CHAPTER I
Introduction

There is widespread public acknowledgement that the information-rich 21st century presents new exciting challenges that require a paradigm shift in education, from an industrial model of schooling to one that shapes the student as a lifelong learner. Nevertheless, many government reform efforts and accompanying research focus on more technical approaches such as narrow standards-based school curriculum, data-driven lesson planning, rigid pacing guides, and standardized testing of student knowledge. This narrowing of focus may marginalize the study of schools implementing instructional programs that center on critical thinking skills, interdisciplinary approaches, and cultural perspectives that will better prepare students to thrive in this new century. Citizens of the 21st century face a growing need to be able to access and make sense of increasing amounts of information while functioning in a globally connected, diverse society. Future professionals will be required to be equipped with a new set of intellectual skills, including abstract and systems thinking, experimentation, and collaboration, which will allow them to face increased complexity and be a productive part of new economic opportunities (Reich, 1991; Thornburg, 1992; Wagner, 2002).

In addition to this challenge, recent work in the field of education and developmental psychology has documented new ways of understanding how children learn. Research now shows that contrary to previous notions of human learning, children are not empty vessels where knowledge can be deposited. Instead, real learning comes about through the dynamic interaction that occurs among the student, the prior

knowledge he or she brings, and the new learning experiences organized and guided by educators. The work of numerous educational researchers, most recently Howard Gardner (1999), now point to intellectually active processes such as information sorting, questioning, formulating hypotheses, and interpretation as key to a deep understanding of concepts and the development of higher-order thinking skills.

Together, changes brought about by the information era along with our improved understanding of human learning call for a model of schooling that emphasizes reasoning, problem solving, and social skills that promote deep learning and are essential in a knowledge-based economy (Cross & Israelit, 2000; Cross & Parker, 2004). Research has shown that schools already leaning toward this pedagogical direction design interdisciplinary, intellectually challenging, and engaging curricula, provide real-world learning opportunities, promote the development of students' voices in their work, and use a wide number of soundly based assessment tools to measure students' mastery of reasoning and creative skills (Wagner, 2002; Murnane & Levy, 1996; Suarez-Orozco & Sattin, 2007; Tucker, 2007;).

The International Baccalaureate Program

The emergence of schools around the world that are embracing the challenge of education for the 21st century present new opportunities for research aimed at understanding and developing new models of schooling. One of the leaders of the school movement toward a global citizen and reflective learner model has been the International Baccalaureate Organization (IBO). Its academically challenging educational program offered by schools in approximately 120 countries around the world is composed of the

Primary Years Program (PYP), Middle Years Program (MYP), and Diploma Program (DP).

The stated objective of these programs is for students to learn "how to learn, how to analyze, how to reach considered conclusions about man, his languages and literature, his way in society, and the scientific forces of his environment" (International Baccalaureate Organization, 1999). The programs are designed for the development of students' understanding of concepts, gains in current and internationally relevant knowledge, the acquisition of interdisciplinary skills, engagement in actions related to their learning, and the formation of globally minded attitudes. Intuitively, the coherent implementation of the IB program and the achievement of its objectives within a school will greatly depend on the work that its teachers and administrators do together as they make sense of the program and create a learning experience conducive to IB goals. Thus, schools implementing the IB program—if done with integrity to the tenants of the program—provide a natural and appropriate setting to explore how teachers and administrators work together toward its design and development.

Deep and careful analysis of the collective work of teachers and school administrators as they embark on the adoption, design, and implementation of these instructional programs is essential to lay the foundation of school models that address and promote the needs and skills necessary for 21st-century learners. Thus, this study seeks to understand the design and early implementation of the IB's MYP at a K-11 IB school in Venezuela through the tasks embodying this process and the social dynamics involved in their enactment.

Literature Overview

The development and implementation of curricula that responds to the needs of 21st-century learners and to contemporary developments in education requires schools with organizational structures that are based on the principle of collaboration (Hargreaves, 1994; Henderson & Hawthorne, 2000). Henderson and Hawthorne's conception of transformative curriculum design—focusing on thinking-centered learning, diversified interdisciplinary learning, constructivist activities, and performance-based assessment—is built on teachers working together in the development of curricular goals, vision, and design. The holistic nature of interdisciplinary approaches, real world experiences, and whole-child assessment make teacher collaboration around curricular work essential to this process (Brandt, 1991; Drake, 1993; Five & Dionisio, 1996; George, 1996; Krechevsky, Gardner, 1995; Mansilla, Miller, & Gardner, 2000; Mathison & Freeman, 1997; Wiggins, 1993).

Teachers engaging in collaborative work have been defined as "a group of people across a school who are engaged in common work; share to a certain degree a set of values, norms, and orientations towards teaching students, and schooling; and operate collaboratively with structures that foster interdependence" (adapted from Van Maanen & Barley, 1984, as cited in Achinstein, 2002, p. 421-422). When working in collaboration, teachers are able to access and make use of the individual and collective resources embedded in their professional network (Rigano & Ritchie, 2003). As teachers design and plan together, best practices are shared and developed through their discussions to be taken into classrooms (Little, 2003; Wenger, 1998). These findings suggest important

ideas that the proposed study will explore in relation to teachers' collective development and implementation of the IB curriculum.

Two theoretical frameworks have emerged as particularly important in deepening our understanding of the collaborative work that teachers do in schools and the conditions under which it occurs: distributed leadership and social capital.

Distributed Leadership

The interactive and social nature of the work done in schools by teachers and administrators has been recognized from an organizational perspective by the development of a distributed leadership framework in the educational field. From this perspective, organizational activity and knowledge is seen as rooted in the distribution of cognition and action among school members along with the structures and codes of the organization (Gronn, 2002; Pearce & Conger, 2003; Spillane, Coldren, and Diamond, 2001; Spillane, Halverson, & Diamond, 2001). From this view, the idea of leadership moves away from personality traits, roles, and positions and is defined instead in terms of actions and processes as "the design and enactment of tasks involving the identification, acquisition, allocation, coordination and use of social, material and cultural resources tied to the core work of the organization" (Spillane et al., 2001; Spillane, 2006). Distributed leadership is fundamentally a theory of *practice,* of the design and enactment of school leadership tasks—including the construction of an instructional vision and the establishment of collaborative structures, both concerns of this study. The focus of the distributed framework on both the social and situational aspects of leadership *practice* provides a novel way to study and think about leadership in terms of the inner workings of the school and its members. It offers researchers a way to investigate the how and why

of instructional initiatives undertaken by schools and of the day-to-day work of school leadership, potentially suggesting innovative ways to perceive and improve the work of educational organizations.

Although distributed leadership—in particular its normative interpretation—has generated much interest in the educational field in recent years, a research-based understanding of *how* leadership is actually distributed and of the different *configurations* that leadership distribution takes in schools has not been extensively explored (Spillane et al., 2001; Timperley, 2005). Some of the most significant research gaps in the distributed leadership literature in this sense are (a) the lack of empirically supported patterns of the social leadership distribution of specific school functions such as curriculum planning, team building, and professional development; and (b) the lack of a comprehensive explanation of the role of different kinds of artifacts and tools in leadership distribution.

Distributed leadership theory has generated enthusiasm for the notion of school leadership as dependent on "highly interdependent, dynamic and multidirectional social processes" (Harris, Leithwood, Day, Sammons & Hopkins, 2007). However, there is little conceptual and empirical clarity in how these processes and their outcomes come to be defined by people interacting with one another. Although the central tenet of distributed leadership is that leadership practice is *stretched over* school agents (principal, teachers, specialist, etc.), what is less clear is how the social and professional relationships among these agents give rise to action, innovation, and organizational success. This study argues that an understanding of organizations from a social capital perspective—where interpersonal relationships harness the potential to facilitate goal orientation, shared trust, and the creation of knowledge leading to successful collective action—can prove to be

instrumental in supporting and deepening research studies from a distributed leadership perspective.

Network Theory of Social Capital

It has become increasingly clear that organizations in a knowledge-based economy are driven not by individuals' technical knowledge but by the productive interdependence of its members and their ability to leverage the existing knowledge and resources in the organization. Research on educational organizations has reiterated this notion by suggesting that the interpersonal relationships among school members are crucial to the implementation of programs and their success. Such interactions among individuals in social systems, along with the collective properties that arise from them, have prominently come to be conceptualized in the literature as social capital (Bourdieu, 1986; Coleman, 1988; Lin, 2001).

At an organizational level, social capital is concerned with the social processes through which the organization's collective assets are used to accomplish its objectives. Network theory of social capital proposes that the purposive access and use of assets in an organization is strongly determined by the configuration of its interpersonal ties and the social structure that arise from them (Lin, 2001). In schools, social networks consist of a set of actors—teachers and administrators—that are connected to one another through a series of different relations or ties. Pedagogical knowledge, reform information, emotional support, and a variety of other resources may flow through these ties in schools from one actor to another (Scott, 2000; Wasserman & Faust, 1994). Network theory of social capital presents itself as an appropriate framework for operationalizing, measuring,

and studying the interactions of school members as they collectively shape the planning and enactment of innovative and challenging IB school curricula.

Purpose

The purpose of this study was to explore—through a distributed leadership and social network framework—the ways teachers work in collaboration when designing and implementing the IB's MYP curricula, along with the supportive conditions that enable them to do so effectively. The study describes and analyzes the tasks, leadership configurations, communication, and collaboration patterns that arise within the school staff as they develop an instructional vision and curriculum guided by IB parameters. The following research questions and methodology guided this study.

Research Questions

1. How is the process of MYP curriculum planning socially distributed in this school?
2. In what ways has the implementation of the MYP supported or constrained leadership distribution around curriculum in this K-11 school?
3. In what ways do existing social networks support and constrain the work of teachers and administrators around MYP curriculum in this school?

Methods Overview

This study took place in I.E. Juan XXIII in Valencia, Venezuela. The school, covering from kindergarten to 11th grade (the last year of Venezuelan high school) and serving 2,200 students, is divided into 3 sites. The research was conducted at the largest site covering 6th to 11th grades and implementing the IB's Middle Years Program and Diploma Program.

To explore and understand the curriculum work and instructional leadership that occurs in this school as they designed and began implementation of the MYP, this project used a case study design (Merriam, 1998; Yin, 2003) consisting of four main methods of data collection: (1) Social Network Analysis (SNA), (2) interviews (Holstein & Gubrium, 2003; Yin), (3) participant observation (Spradley, 1980), and (4) document review (Merriam).

The first step in collection of data consisted of administration of an SNA survey to all teachers and coordinators from 6th to 11th grade. Three distinct networks were measured and examined: curriculum collaboration, IB information, and effort recognition. These networks were measured at two different points in time, once at the beginning of the school year when faculty was in the process of MYP curricular design and again a year later when the curriculum designed was in place. Measures of network density, centrality, and overall structure, as well as structural model,s were analyzed using both social network (UCINET and SIENA) and statistical (SPSS) software.

Following initial analysis of the networks measured, interviews covering curricular work and collaboration were conducted with the two school principals (academic and administrative) and the two IB coordinators. Teachers in the area department coordinator position for the six subject area teams were interviewed. In addition, and based on network data, two teachers per department were interviewed regarding their work on development of the MYP program.

The study used the process of meaning condensation described by Kvale (1996) to interpret the transcribed interview. Responses were coded and grouped for comparison between teachers' perspectives and department curricular work. Qualitative data was

analyzed using a constant comparative analysis method (Boeije, 2002; Glaser & Strauss, 1967) through checking and rechecking emerging themes (Miles & Huberman, 1994). Emerging themes were analyzed and reexamined looking for patterns across groups. Themes and patterns that emerged were examined through the lens of social capital, network theory, and distributed leadership.

The third method of data collection used in this project was observation and documentation of school meetings, where teachers participated as they worked in subject area teams to plan and design curriculum (Creswell, 2002; Spradley, 1980). Subject area planning meetings were be observed, recorded, and analyzed. Observations took place during design phase of the MYP curriculum. Data collected was triangulated with information from interviews and school documents and emergent themes across the different sources were identified.

A final but extremely important data source for this project was the different school documents, teachers' planning artifacts, and tools, which constitute a critical part of curriculum development. Each document gathered in the data collection was be analyzed. Yin (2003) maintains that the most important use of documents is to corroborate and augment evidence from other sources. Review of these artifacts and tools is also important to understanding and unpacking constitutive elements of distributed leadership. Content analysis (Merriam, 1998) was the systematic procedure used for describing the content of the relevant documents collected.

Significance

This study has important significance on three important levels. First, findings provide an understanding framed by distributed leadership and social network theory of

the interactive work of school members that embody the MYP's curriculum planning and early implementation. These findings represent the active use of these theories to unpack in detail what these processes look like in schools, the conditions under which they unfold, and how teacher participation is shaped. Second, the study provides theoretical conclusions resulting from application of distributed leadership as a research lens and its integration with social networks that lead to a revised and improved theoretical model. These theories, still in developmental phase, are benefitted by refinement offered through their use in current research and conscious attempts to address literature gaps. And third, the study informs the practice of design and implementation of 21st century academic programs by presenting lessons and implications for their success drawn from the case-study experience.

In summary, this chapter has provided a general outline for the study conducted. Framed by a global interest and need to develop programs focused on 21st century skills, the study is concerned with exploring the design and early implementation of the IB's MYP in a Venezuelan school. The study is guided by the theories of distributed leadership and social networks as complementary lenses for the understanding of the school's MYP design process. Data collection for the study will consist of conduction of social network surveys, semistructured interviews, observations, and document review in a K-11 school in initial stages of program development. The following chapter will present and describe the theoretical underpinnings of this study and their guiding role in understanding teachers' collaborative work during the process of MYP development.

CHAPTER II
Literature Review

The challenge presented by an increasingly globalized society and the rise of a 21st century knowledge economy along with a better research-based understanding of human learning has become a major driving force for the development of new models of education. These models recognize the importance of creating learning experiences for students that promote their critical and creative thinking, engage them in global perspectives, and encourage collaborative problem solving. Teachers and administrators implementing 21st century school programs need to actively collaborate in the design of integrative and interdisciplinary units that span traditional subject boundaries under a shared academic focus. They also need to jointly develop diverse assessment tools to be better able to evaluate students' integral growth and that support and stimulate their further learning. These in-school design practices are supported and facilitated by professional relationships among school members and formal organizational structures meant to maximize purposeful collaboration. The proposed research seeks to explore in-depth teacher and administrator enactment of curricular planning and design actions to better understand the inner workings of schools implementing innovative academic programs. Recognizing the social and collaborative nature of these processes, the study will be assisted by two theoretical frameworks founded on this notion: distributed leadership and social capital.

In this chapter, the theoretical frame for studying the design and implementation of the International Baccalaureate's Middle Years Program (MYP) and Diploma Program

curriculum will be brought together following three main points/ideas. First, distributed leadership will be presented as a novel explanatory theory for understanding instructional leadership and how work gets done in 21st century educational systems. Second, to deepen our understanding from a distributed perspective of the complexity of schools as organizations and the social processes that occur within it, the notion of social capital will be introduced as a key component of school dynamics. Finally, social network theory will be defined as a narrower and quantifiable understanding of social capital through which leadership social configurations activated by the IB curriculum development to be studied can be illustrated and explored.

Distributed Leadership

Distributed leadership has recently gained currency in the educational leadership. The term has been conceptualized in two different ways, a normative and a descriptive form, each of which has important implications for its use as a framework to understand leadership. The normative interpretation of distributed leadership presents it as a model to be implemented, as a way for leaders to *do* leadership. Leaders are to actively distribute authority and agency by following "a set of direction-setting and influence practices potentially 'enacted by people at all levels rather than a set of personal characteristics and attributes located in people at the top'" (Fletcher & Kaufer, 2003, p. 22 as cited in Harris, Leithwood, Day, Sammons & Hopkins, 2007, p. 339). From this view, distributed leadership has also been defined as "a shared process of enhancing the individual and collective capacity of people to accomplish their work effectively... [where] functions are distributed among different members of the team or organization" (Yukl, 2002). Proponents of the normative view argue that "distribution of leadership" helps in

"maximizing sources of information, data and judgment, and spreading the detrimental impact of the consequences of miscalculation and risk" (Gronn, 2000). Distribution is to be achieved by allocating resources through strategies such as stratification, laterality, networking, or clustering (Gronn, 2002). However, this normative understanding of distributed leadership makes it susceptible to criticisms given that its research is only in its early phases and several reviewers have so far found mixed empirical evidence backing these assertions. This lack of data and consistent findings in the research may make it easily viewed as inaccurate, ineffective, or worst of all just another one of the fashionable models that emerge periodically and can be counted on to disappear when the next new leadership vogue arrives in education (Fullan, 1995; Gunter & Ribbins, 2003; Silins, Mulford & Zarins, 2002).

The second conceptualization of distributed leadership is one that develops it as a theory of leadership as opposed to a set of prescribed techniques or practices (Bennett, Harvey, Wise, & Woods, 2003; Spillane, 2006). It follows the last decade's renewed interest in "dynamic, organizational views of leadership…as a social influence process [that] permeates organizations rather than residing in particular people or formal positions of authority" (Smylie, Conley, & Marks, 2002, p. 167 as cited in Maxcy & Nguyen, 2006). Based on activity theory and distributed cognition and moving the focus away from individual agency and hierarchical leaders, a distributed view presents leadership activity as rooted in the distribution of cognition and purposeful action among members, structures, and artifacts of an organization (Gronn, 2002; Pearce & Conger, 2003; Spillane, Coldren & Diamond, 2001; Spillane, Halverson & Diamond, 2001).

The work of James Spillane is recognized as one of the most complete and consistent theoretical models of distributed leadership, one that supports both the transformational and managerial dimensions of leadership. This more descriptive notion of distributed leadership frames its understanding in terms of a practice "stretched over the school's social and situational contexts" founded on four elements: leadership tasks and functions, task enactment, social distribution of leadership, and situational distribution of leadership (Spillane, Halverson, & Diamond, 2001). From this point of view a "distribution of practice continuum" emerges based on the degree that leadership tasks are actually stretched over the people and situation in an organization, going from highly centralized activities with hierarchical structures, to co-led and interdependent tasks with flat organizational structures. Recent research has found initial evidence of high levels of distributed leadership, operationalized in these studies as teacher leadership, having positive effects on student achievement, school culture, teacher self-efficacy, and student engagement. These findings have played an important role in the aforementioned current interest on the normative form of distributed leadership and strategies to achieve it (Leithwood & Jantzi, 2000; Mitchell & Sackney, 2000; Silins, Mulford, & Zarins, 2002).

However, a research-based understanding of *how* leadership is distributed and of the different *configurations* that leadership distribution takes in schools has not been adequately developed yet for normative directions of the theory to be formulated (Spillane, Halverson, & Diamond, 2001; Timperley, 2005). Although a very recent study seems to be integrating and capitalizing on initial findings from distributed leadership configurations (Leithwood et al., 2007), for researchers to reliably operationalize, study,

and prescribe effective leadership practices based on a distributed perspective, deeper and extensive descriptions of leadership in action from this view are needed. In this section, I will first review the theoretical roots of distributed leadership theory and describe how it has been conceptualized as a framework to study school practice. Finally, I will review several major studies on distributed leadership, their findings and implications for the field, and the research methods being used to understand the *how* and *why* of leadership distribution.

Distributed Cognition and Activity Theory

Distributed leadership has its theoretical foundations in the distributed cognition and activity theory branches of psychology and human behavior. Distributed cognition proposes that human knowledge and cognition cannot be adequately understood solely in terms of an individual's mental capability. It considers the situational context that enables sense-making as a constitutive element of human knowing and knowledge (Resnick, 1991). Thus, cognition is understood as distributed across individuals and the environment's artifacts and tools as representations of knowledge. Similarly, activity theory, tracing its roots back to the work of Lev Vygotsky, considers human activity to be socially situated, "…a product of what the actor knows, believes and does in and through particular social, cultural and material contexts" (Spillane, Halverson, & Diamond, 2001). Both distributed cognition and activity theories suggest that human knowing and action, even when involving a single individual, cannot be fully explained without considering the sociocultural structures and artifacts he relies on (Wertsch, 1991). At the same time, the duality of individual agency and distribution is recognized within these

frameworks acknowledging that some cognitive activity is more distributed than others (Perkins, 1996).

Distributed Leadership as Practice

These frameworks of cognition and human activity allow for a leadership theory that addresses a fundamental blank spot in the literature on educational leadership: The how and why of school leadership activities (Hallinger & Heck, 1996). Distributed leadership is fundamentally a theory of leadership *practice*, of the design and enactment of leadership tasks considering their social and situational constitution with equal importance. In this perspective, the idea of leadership moves away from personality traits, roles, and positions, instead being conceptualized in terms of actions and processes and defined as "the design and enactment of tasks involving the identification, acquisition, allocation, coordination and use of social, material and cultural resources tied to the core work of the organization" (Spillane, 2006; Spillane, Halverson, & Diamond, 2001).

At the initial stages of the first major effort to study leadership under the distributed framework, The Distributed Leadership Study (DLS) led by Spillane and his colleagues at Northwestern University, the theory was developed around four ideas, which emphasized the perspective's focus on leadership activities (Spillane, Halverson, & Diamond, 2001):

1. Leadership tasks: Following Heller and Firestone's (1995) argument for an understanding of leadership through functions rather than positional leaders, leadership practice is organized around: (a) macro, big-picture functions such as the development of an instructional vision, monitoring of instruction and building a collaborative culture

among others found in the educational leadership literature, and (b) micro tasks involving the day-to-day activities performed at the ground level that support the realization of macro tasks.

2. Task enactment: Distributed leadership places particular importance on the actual unfolding of leadership actions as performed by actors. Arygris and Schon's work (1974) has been applied to distinguish between tasks as designed (espoused theories of practice) and tasks as actually enacted (theories in use). Leadership practice theory seeks to understand how leaders define, present, and carry out their tasks.

3. Social distribution of task: Based on the distributed cognition and activity theory model, leadership tasks are seen as performed by multiple actors; not as a simple division of labor but their enactment actually *stretched over* the practice of the individuals involved. This notion recognizes that the completion of tasks, such as the design of interdisciplinary units to be studied here, takes teachers working together and performing diverse and dynamic roles.

4. Situational distribution of tasks: The practice of leadership is also stretched over its situational context, which consists of its organizational structures, social arrangements, artifacts, tools, and language. These elements are not perceived as external factors affecting leadership tasks; they are a comprising component of the practice.

In subsequent works, arguing that leadership tasks cannot be appropriately understood and studied in disassociation from their social and situational distribution, the four elements described above have evolved and been integrated into the two aspects of distributed leadership: the leader-plus aspect dealing with the social distribution of tasks, and the practice aspect, entailing the actual enactment of tasks under specific contexts

and arrangements (Spillane, 2006; Spillane, Camburn, Lewis, & Stitziel-Pareja, 2006). In the following section, the theoretical focus of these two aspects will be presented along with the research methods used to study them and some of their most important findings.

The Leader-Plus Aspect

Previous research on educational organizations has found that a number of people in the school, including teachers, coaches, and external consultants, assist the principal by taking on responsibilities and performing key leadership functions and routines (Heller & Firestone, 1995; Smiley & Denny, 1990). The leader-plus aspect of distributed leadership, taking on the social distribution of tasks, acknowledges that leading and managing a school requires the involvement of multiple individuals. The study of this aspect of distributed leadership has been focused on finding the actors across whom leadership activities are stretched over and the nature of the tasks that are distributed across different actors.

Scholars studying the social distribution of leadership practice in the search for descriptive, firsthand data have used a variety of innovative methods of data collection in addition to in-depth observations of practice, and structured and semistructured interviews of school leaders. The experience sampling method (ESM) consists of the use of a handheld electronic device distributed to principals or any other actor in the school. The device beeps at a set number of times during the day prompting the principal to complete a questionnaire on the nature of the activity they are performing and whether they are leading, coleading or merely participating, and what other persons are involved in the activity. The log the ESM produces allows researchers to capture certain elements of leadership action as it occurs during a regular day, and which represents an advantage

over recall surveys. It also makes it possible to collect data on a large number of principals, which is not possible with shadowing techniques. However, this method only tells us about distributed leadership actions in which the actors are co-present; it does not provide information on sequential or coordinated collaboration. ESM data collection can be complemented by the use of end-of-day logs that principals fill out after each school day where they report on their practices and answering several questions about their involvement.

Another important data collection tool used in this area is social network surveys where respondents report their interactions with other school members mapping out central players perceived to be performing leadership functions (Mangin, 2005; Spillane, Camburn, Lewis, & Stitziel-Pareja, 2006; Spillane & Sherer, 2004). In this study, this approach was used to map leadership configurations that take shape in the development of MYP curriculum in the case-study school. A deeper explanation of the theoretical bases of social network analysis and its implications for this study will be presented in the second section of this review as they are closely related to the social capital perspective that will be covered.

Studies from the past four years from a distributed perspective have arrived at some important findings, further building the foundation of this theory. First, confirming earlier findings, principals share leading and managing of the school with several important school members such as assistant principals, subject area specialists, teacher leaders, and classroom teachers. Second, studies have found that not only are individuals with formal leadership positions performing these tasks, but informal leaders such as classroom teachers have also emerged as key players in the day-to-day leading of the

school. This suggests that methods which focus exclusively on formal leaders will miss an important facet of leadership in schools (Camburn, Rowan, & Taylor, 2003; Spillane, Camburn, Lewis, & Stitziel-Pareja, 2006). This study relied on innovative data collection methods—to be covered in the third chapter of this proposal—which allowed for the inclusion of a variety of perspectives and measures for its analysis.

Most of these initial studies have focused on principals' activities due to their position as the main source of formal leadership in the school and have found interesting patterns of distribution. In one of the studies from the DLS, principals report leading less than 70% of the activities they were involved in while almost 50% of the activities they led were coperformed with both formal and informal leaders (Spillane, Camburn, Lewis, & Stitziel-Pareja, 2006). Principal's involvement in leadership tasks were found to depend on the nature of the activity, leading almost 80% of administrative tasks but only about half of the instructional and curriculum related activities they were involved in. These results indicate that principals seem to be generalist, involved in a broad range and large scale of functions rather than task-specific formal leaders (Camburn, Rowan, & Taylor, 2003). Assistant principals are the actors more likely to be leading and coleading administrative leadership tasks, while teacher leaders and classroom teachers were more likely to perform instructional leadership tasks (Spillane, Camburn, & Pareja, 2007). The distribution of instructional and curriculum-related functions across teacher leaders and classroom teachers was found to vary depending on the subject matter, involving more leaders in language arts departments compared to mathematics (Spillane, 2005; Spillane, Coldren, & Diamond, 2001).

To summarize, the social distribution, or leader-plus, aspect of leadership tasks posits that multiple actors aside from the principal typically perform leadership functions in the school. Although the empirical research and knowledge in this area is still in its initial stages, we know that there are actors with formal and informal leadership positions performing leadership tasks, that instructional and curriculum related leadership activities tend to be more distributed than administrative ones, and that the distribution of leadership across teachers depends on the type of activity and the subject matter. Further research guided by distributed leadership theory and focused on the social distribution of tasks should confirm and deepen the understanding of these findings and look at other variables affecting distributed configuration, such as the type of school (public, private, magnet, IB), population, and team purpose, among others.

The Practice Aspect

There is more to consider in the distribution of leadership tasks than just the actors involved. The practice aspect of distributed leadership embodies the actual enactment of tasks not as the aggregated actions of individual leaders but instead holistically framing it as "the product of the interactions among school leaders, followers and their situation embedded in their organizational structures, artifacts, tools and language" (Spillane, Halverson, & Diamond, 2001). This aspect has been explored in two main dimensions: people and situation.

People dimension. An important concern of distributed leadership research has been to understand the nature of the interdependencies and interactions among school leaders and how they shape leadership practice. Spillane, Diamond, and Jita (2003) closely analyzed the interactions of leaders in eight elementary schools in Chicago as part of the

Distributed Leadership Study. Their goal was to identify the different arrangements through which leadership is stretched over actors, collecting and analyzing data from in-depth interviews with school leaders and observations of school-planning meetings, professional development, supervision of instruction, and other instances for interaction. They classified their findings on distribution over people into three types:

1. Collaborated distribution referring to leaders simultaneously coperforming a specific leadership activity. Practice in collaborated distribution is defined by the interdependent actions of participants (e.g., actions of formally appointed leaders in conducting a Literacy Committee meeting; teacher joint development of planning protocol).

2. Coordinated distribution in which leaders perform different leadership tasks in a sequential, interdependent manner. For example, the sequential routines necessary for a data assessment meeting: creation of student instrument, administration of instrument, analysis of results, etc.

3. Collective distribution where leaders separately and simultaneously perform interdependent, complimentary activities in pursue of a common goal such as the simultaneous actions of a principal and a subject coach for the monitoring of instruction.

Alternatively, Gronn (2002) has developed a taxonomy for leadership social arrangements differentiating between activities that are coperformed and actors who are present in close physical proximity, and collectively performed with leaders acting dispersed throughout the site. Gronn (2003) has also classified concerted action in organizations into three forms: (a) spontaneous collaboration where actors pool their expertise and actions to solve an arising problem, (b) intuitive working relations that

build over time among two or more members who frequently rely on each other's work, and (c) institutionalized practices, which refers to the coperformance of activities as specified and guided by organizational policies.

These models represent the social arrangements of leadership distribution and offer a framework to contemplate and study the personal interactions that constitute the practice of leadership. They can be helpful in understanding and framing the ways in which teachers are working with one another and how school leaders are organizing and acting to implement innovation such as the one I plan to investigate. Future research should look at the type of macro functions and micro tasks that fall under each type of distribution arrangement and the factors required for their effectiveness.

Situational dimension. In addition to people, leadership practice is also constituted by and distributed over its situation, composed of an inclusive list of organizational structures, routines, and tools. The situation is not considered as either determinant of or determined by practice; instead their relationship is understood as a dynamic coshaping between leadership activity and its context (Spillane, 2006). Formal organizational structures and artifacts such as routines and tools are also considered materialized representations of the goals and plans of leaders, which shape and are shaped by leadership practice (Spillane, Diamond, & Jita, 2003). Routines and artifacts act as mediating means for actors to engage in purposeful activity (Spillane, Coldren, & Diamond, 2001).

Focusing on systems of practice, Halverson (2003) has explored in-depth the evolution and use procedures, tools, and other artifacts in shaping school leadership practice. Through interviews with school personnel, observation of formal routines, and a large number of tools like planning documents, meeting agendas, and evaluation forms,

Halverson has drawn some conclusions about how leadership is distributed across them. School routines like monthly assessment meetings and instructional practices meetings can intentionally supplement professional development for teachers, provide opportunities for them to lead and participate in direction-setting discussions, and contribute in creating a shared sense of vision and direction, all essential macro functions of school leadership. Halverson argues against looking at each artifact in isolation since this misses the coevolution and cofunctioning of a system of practice and its context.

Spillane, Coldren, and Diamond (2001) studied the distribution of pedagogical knowledge in five elementary schools using social network analysis, observations, and interviews with school members and found that routines and tools were important factors in the purposeful distribution of knowledge across the school. They identified two types of knowledge that transferred through material artifacts: organizational maintenance through grade level meeting agendas and minutes, lesson plans and bulletins, and instructional knowledge, which was supported by writing folders of students. Spillane et al. also found that the distribution of instructional knowledge differs by subject matter with math instructional materials being more specific and with more immediate use in the classroom compared to language arts materials.

Overall, studies of artifacts and tools indicate that they play an important role in supporting the development of knowledge, trust, and collaboration norms for school leaders and teachers. They also tangibly represent instructional, moral, and social leadership that serve as a guide for the school's daily activities. It is crucial then for the study of the design and implementation of the IB program in schools to map and analyze the artifacts leaders are creating and using to interpret, plan, and design their own IB

curriculum. Understanding what these artifacts represent and how they work to guide school functions and tasks will provide insight into the practice of leadership in the face of change and innovation.

In summary, distributed leadership presents a school leadership theory that focuses on its practice and specific actions as opposed to traditional theories based on individual agency of leadership. It considers leadership under two aspects: (1) the leader-plus aspect which describes the social distribution of school leadership tasks as stretched over or distributed along school members, (2) and the practice aspect, which frames the actual enactment of these tasks in the different arrangements through which people interact and the situation they are embedded in as constituent elements of leadership. A schematic representation of the distributed leadership model developed for this research study is offered in Figure 2.1. Recent empirical research has only begun to explore and uncover the variety of configurations of leadership distribution in schools along the principal, subject-area teams, professional development sessions, and the structures and artifacts employed.

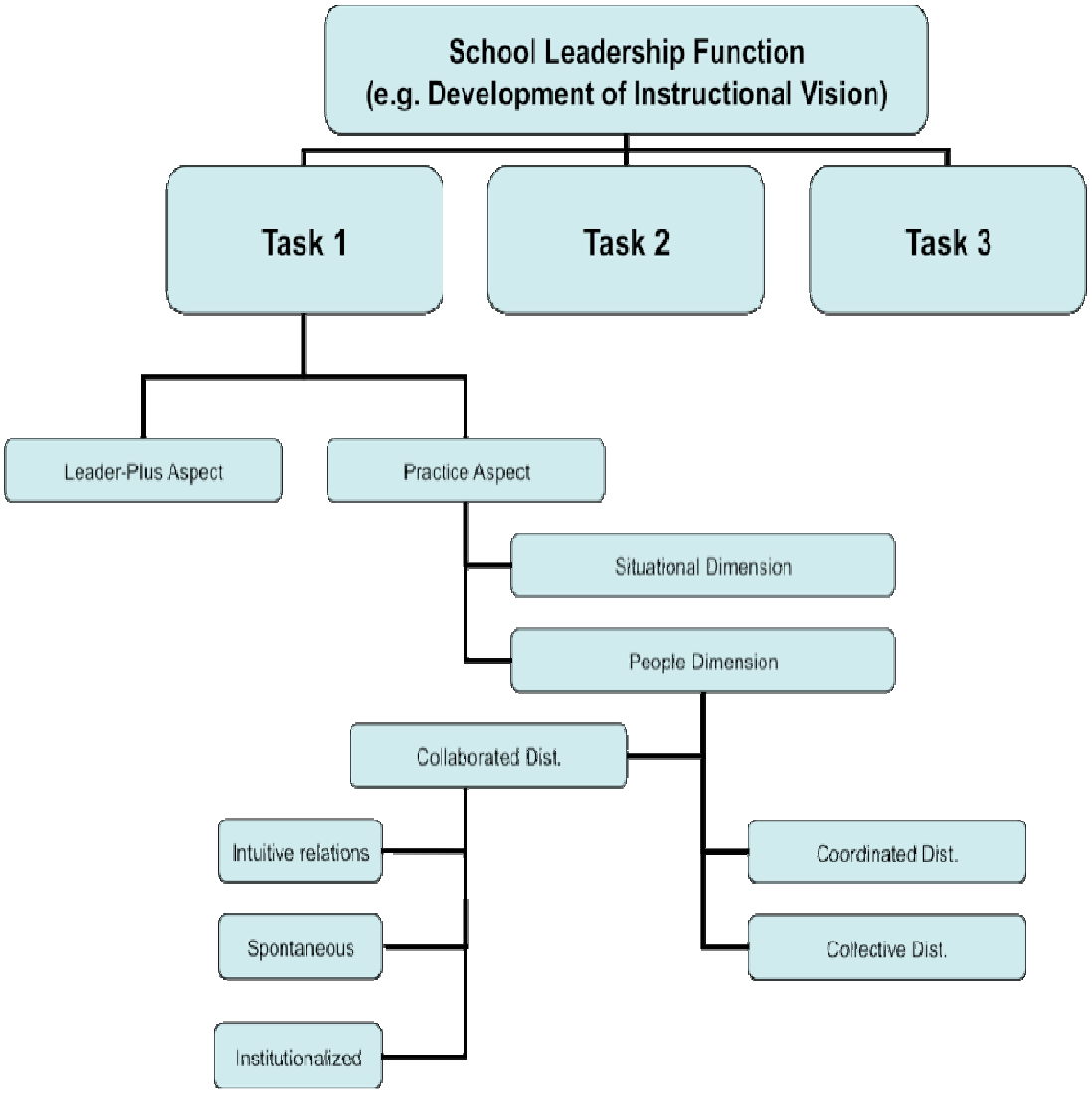


Figure 2.1: Distributed Leadership Model (Integration of Spillane, 2006; Gronn, 2003)

As the literature presented so far illustrates, distributed leadership has advanced and popularized the notion that school leadership depends on "highly interdependent, dynamic and multidirectional social processes" in which the whole school is involved (Harris, Leithwood, Day, Sammons, & Hopkins, 2007). From a distributed perspective, Gronn (2000) argues that an organization's "entitative status entails patterned and reproduced activity-based conduct, enshrining varying degrees of tightly or loosely

coupled relations between the agents involved." However, an important research gap exists in this aspect given that there is little conceptual and empirical clarity in how these processes and their outcomes come to be defined by people interacting with one another. Although the central tenet of distributed leadership is that leadership practice is *stretched over* school agents (principal, teachers, specialists, etc.), what is less clear is how the social and professional relationships among these agents give rise to action, innovation, and organizational success.

Social relationships in organizations have been found to harness the power to facilitate collective goal orientation, shared trust, and the transfer and combination of knowledge that leads to successful collective action (Leana & Van Buren III, 1999). Although social ties in schools have been explored by some researchers through the use of certain methodological approaches such as social network analysis, the distributed leadership perspective would benefit from a deeper and more grounded exploration of the social relationships that exist among teachers and administrators in schools. Studying the way school members access resources through these relationships, how information and knowledge flow through them, how they are able to support one another, and essential conditional factors such as trust, codes, and status has the potential to help us understand how they might influence or even determine leadership distribution. Thus, social capital and social network theory seem like an ideal fit to expand our understanding of distributed leadership.

Social Capital

The concept of social capital has been defined in numerous ways and is often used as an umbrella term for a wide range of social processes, from the prosperity of nations

and (Putnam, 1993), the preservation of power (Bourdieu, 1986) to the performance of business firms (Baker, 1990). Its central proposition is that the human relationships in a social system represent a valuable resource to be used by individuals and the collective for productive action.

In the educational field, James Coleman's (1988) functionalist view of social capital has been the most predominant and influential framework theoretically grounding the collective properties of social organizations, such as schools and their communities, as productive resources on an individual and organizational level (Dika & Singh, 2002). In this frame, social capital consists of the specific elements of social structures that give access to valued resources and that enable organizational actors to act in productive ways (Coleman; Putnam, 1993). Unlike human capital (which refers to the knowledge and skills possessed by an individual) and physical capital (contained in infrastructure and equipment), social capital does not reside solely in any individual actor or artifact; instead it is an inherent property of the structure of human relationships in a given organizational setting (Coleman, 1988; Dika & Singh, 2002).

Social capital arises from the relationships among individuals in an organization in three different forms that share two main functional characteristics: (a) they constitute some aspect of the social structure, and (b) they facilitate the actions of individuals within the structure. These forms, as defined by Coleman, are: (a) trust, which refers to the degree of confidence among individuals that group obligations and expectations will be met; (b) access to information, through channels that provide knowledge as a basis for individual and collective action; and (c) norms and sanctions that control communication

and action within a community by establishing a degree of consensus that promotes the common good.

Coleman's (1988) foundational research was initially motivated by wanting to understand the link between academic achievement and social inequalities on an individual's level of action and returns or benefits from his actions. By exploring the role of social capital in the education of youth, viewed as the creation of human capital, it was found that high levels of social capital in the family, embedded in the strong relations between a child and his parents, will provide the child greater access to adult's human capital that will assist learning. Coleman's initial studies of social capital indicate that on an individual level the larger the number and the stronger the social relationships an actor has the broader and better the information that will be available. These findings have been confirmed and expanded by Burt (1992, 1997), Marsden (1988), and Portes and Sensenbrenner (1993), who all have explored the ways in which individuals invest in social relations and how they capture resources embedded in these relationships to generate returns.

Organizational Social Capital

Although originally driven by individuals' access to social capital, Coleman's (1988) work has widely stimulated further research and refinement of the field on an organizational level. Specifically, two comprehensive reviews have laid out an organizational framework of social capital and its role in the creation of value based on Coleman's functional view. From a business management perspective, Nahapiet and Ghoshal (1997) and Tsai and Ghosal (1998) have elaborated on social capital theory by identifying the form social capital takes in business units and focusing on its importance

in the creation of intellectual capital in organizations (in this proposed study this would be the development of 21st-century school curricula). Their theoretical model identifies three highly interrelated dimensions of social capital in organizations that are closely associated to Coleman's: (a) structural dimension, referring to the location of actors in the social structure and their social interactions; (b) relational dimension, the assets embedded in social relationships such as status, approval, and trust; and (c) cognitive dimension, embodied by the codes and paradigms shared by individual actors.

These dimensions take on special importance for innovation and the creation of value in organizations as they are essential facilitators of the combination and exchange of knowledge that lead to the creation of new intellectual capital (Moran & Ghoshal, 1996; Schumpeter, 1934). The structural dimension of social capital influences the development of innovation through dense and stable human relationships necessary for the establishment of trust, the efficient flow of information and meaningful collaboration. The production of new valuable knowledge in organizations is also stimulated by the relational dimension of social capital through high levels of trust which maintain open communication and group identity enhancing collective processes and outcomes. Finally, the cognitive dimension of social capital also proves to be critical for the creation of organizational value when members share a common language, vocabulary, and paradigms through which communication is encoded and knowledge is combined (Nahapiet & Ghoshal, 1997; Tsai & Ghosal, 1998). Taken together, the organizational social capital framed by this line of research suggests that social relations, their context and overall structure are at the root of the creation of new knowledge and innovation in organizations. Thus, high levels of social capital potentially enhance an organization's

effectiveness and capability for action by having a positive impact on the development and management of knowledge.

At the school level, recent studies have highlighted the important role of social capital on the diffusion and implementation of pedagogical and technological innovations. The social pressure exerted by school colleagues and the existence of informal relationships through which teachers access knowledge pertaining to a specific strategic or technological innovation has been found to have a deciding effect in its adoption and implementation (Frank, Zhao, & Borman, 2004). It is argued that schools that establish a strong culture of common affiliation and of shared resources will build up their social capital and be more likely to successfully diffuse and implement appropriate innovation.

Although there is much enthusiasm for the concept of social capital and the insights it has provided, specifically at the organizational level, there is not a sufficiently consistent framework for its study and use. Perhaps because of its parallel origins in the independent works of Coleman, Bourdieu, and others, and its indiscriminate use by researchers and theorists, the study of social capital has led to divergent theoretical and measurement perspectives.

Critiques to Social Capital Theory

Among the most important authors who have advanced debate and the refinement of theory on social capital is Lin (2001). He identifies three major points of contention in what is considered traditional social capital literature and proposes a more strictly defined and quantifiable social capital based on social relations and social networks.

The first argument in the social capital literature arises from the general agreement among researchers that social capital is both a collective and an individual good. Although social capital is widely recognized as an individual and collective good, Lin (2001) and Portes (1998) have argued that when its definition is taken to be equal to ethereal public goods such as trust and solidarity, an important inconsistency arises since these categories and ideas lose their meaning when taken to an individual level. More importantly, when social capital is equaled to these forms of public goods it is driven away from its theoretical foundation on social interactions and it becomes a mere trendy artifact to promote social cohesion.

A second important debate on social capital is whether closure of the social system to external individuals is a requirement for the existence of social capital (Adler & Kwon, 2002; Lin, 2001). On one hand, Bourdieu's (1986) view of social capital as an instrument for class dominance through in-group solidarity clearly requires a defined group membership and closure of the group to outsiders for social capital to have meaningful value. However, Coleman (1990), from a perspective that focuses on increased access to collective resources and opening channels for individual and collective action, does not require network closure and in fact can be interpreted to place high value in establishing linkages among different collectives within society. Research in social networks has found that bridges and links between distinct social groups are of great importance for the facilitation of new information and exchange of resources (Granovetter, 1973; Burt, 1992). Ultimately, the advantages of a closed or open network to social capital might depend on the outcomes desired by the collective. Closed networks can be beneficial for groups focusing on the preservation and maintenance of resources

and power, while an open network will be advantageous to collectives searching for new information and goods external to the community (Lin).

Because, as was said before, Coleman's structural-functional framework practically dominated the 1990s literature on social capital—particularly in the educational field—much discussion and refinement of the theory has come as a result of critiques on his seminal work (Dika & Singh, 2002; Lin, 2001). The last point of debate can be seen as the one that separates traditional social capital and emergent social network theory. Coleman (1988, 1990) defines social capital by its function, meaning that any social-structural resource that facilitates action and generates returns to an individual within a social system is considered to be social capital. This definition is criticized by Lin as being somewhat of a circular argument where social capital can only be captured by its outcome; the causal factor being defined only by its effect. Although Lin does not deny the functional value of social capital, he maintains that both concepts—social capital and returns—should be treated and measured separately so that "outcome variables do not dictate the specification of the causal variable" (Lin, Cook, & Burt, 2001). This argument is fundamental for the emergence of a quantifiable framework for social capital given that Coleman's theoretical position can only be overcome by refocusing social capital on its root in social relationships with Coleman's forms of social capital becoming conditional factors in social ties.

Social Network Theory

In his attempt to define a quantifiable social capital rooted in social networks and relationships, Lin (2001) proposes social capital as "investment in social relations by individuals through which they gain access to embedded resources to enhance expected

returns of instrumental or expressive actions." Three quantifiable elements are identified in this definition:

1. Social relations: the direct and indirect ties that individuals have to other members of the group that facilitate the access and mobilization of resources embedded in those contacts.

2. Embedded resources: the social resources such as power, status, and knowledge that are embedded in individuals in a network that can be accessed and utilized through existing social relations.

3. Returns: the outcomes generated as a result of access and use of social resources embedded within the social ties of a group. Returns can be instrumental when gains in an economic, political, or social resources area are made; or expressive, when existing social ties are maintained and optimized through returns in individuals' health and satisfaction.

Lin's theory offers four main pathways through which the interplay of the first two elements, social ties and resources, enhance the outcome of individual and organizational actions (returns). First, vital information flows through these ties. Certain strategic knowledge about organizational opportunities and needs can only be accessed through the relationships individuals have with other members of the organization. This knowledge constitutes an essential element for low cost and successful action. Second, social ties are used by individuals to exert influence on other action agents within the organization. Individuals with strategic positions in the network, authority capacities or some other form of powerful status are able to use social ties to guide decision-making and task enactment. Third, relationships have the potential of being acknowledged as a form of social credentials. Individuals who are recognized by the group as having further

access to numerous resources through his/her social ties are also often granted decision-making power with the hopes of bringing in added value to the organization. And fourth, social relationships also become a measure of group identity since they entail a degree of shared characteristics and interests that may reinforce individuals claim to embedded and valuable resources. These four pathways—information, influence, social credentials, and reinforcement—explain how social capital can lead to successful expressive action (aimed at obtaining recognition and legitimacy of owned resources) and instrumental action (aimed at producing and acquiring new resources).

Two mutually supportive approaches have emerged for the measurement of social capital as defined by the social network perspective and the three conceptual elements described above. The first approach to the quantitative measurement of social capital focuses on the actual resources embedded in a network as the main constituent of social capital. It emphasizes tie content such as shared norms, beliefs, and abilities to determine social capital. Measures of tie content usually consider the range of resources that are accessible in the system, the quality, variability, and diversity of resources and the specific actions that they are utilized for, be it expressive or instrumental.

The second and rapidly becoming the most used approach to measuring social capital focuses on the network structure of social ties resulting from the integration of existing productive relationships among network members. Systematic mapping of the social interactions in a system that considers aspects of these relationships such as strength, symmetry and type of return obtained, allows for quantitative measures of network size, density, cohesion, and betweenness that can be used to represent the social capital present in the system (Borgatti, Jones, & Everett, 1998; Burt, 1992). This method,

briefly mentioned in the distributed leadership section, has come to be known as Social Network Analysis (SNA).

An important set of ideas and assumptions, as well as recent research findings, form the foundation for SNA's use as the central method for quantification of social capital. SNA operationalizes social capital as the social relationships, also referred to as ties, through which actors access specific assets embedded in a social system (Lin, 2001). Existence of these relationships implies that individuals are aware of the resources in their network and act upon their ties to access them (Portes & Sensenbrenner, 1993).

Networks are identified by the content that flows or is exchanged through its constituent social ties (Scott, 2000; Wasserman & Faust, 1998). A wide number of resources may be accessed, provided, and created through both formal and informal relationships such as routine information, new knowledge, advice, and personal support among others. In the case of schools we can talk about pedagogical strategies, knowledge about specific reforms or programs, teacher collaboration on lesson planning and collegial advice as some of the resources embedded and used through their networks.

Patterns of social and professional interaction among individuals in organizations define its social capital transactions and distribution of resources by creating distinct network configurations that depend on the strength and overall density of existing ties (Burt, 1992; Granovetter, 1973, 1982; Lin, 2001; Wasserman & Faust, 1998). SNA can reveal the underlying network structures that are important in understanding resource exchanges between individuals and groups within an organization. Understanding these network structures may be useful for educational organizations enacting change as these

underlying networks may be leveraged to better create, use, and diffuse knowledge and innovation (Cross, Borgatti, & Parker, 2002; Song, Nerur, & Teng, 2007).

Centralized, low-density networks have been found to be suited for the transfer of simple, routine information given that it can be easily controlled and diffused by a small core group of individuals to the periphery of the organization (Cummings & Cross, 2003; Hansen, 1999). On the other hand, this type of network also limits the amount of resources that individuals on the periphery can share and access, therefore minimizing overall innovation and action independent of the network's core. This configuration tends to provide selected individuals with strategic positions (structural holes) to advance status-wise and financially by having privileged access to broad and quality information, giving them an advantage to recognize needs and opportunities (Burt, 1992, 1997).

Dense networks formed by strong ties and integrative structures, with members interacting at high frequency levels, support deeper levels of social exchange and collaboration by developing shared organizational mechanisms and routines. This type of network promotes and facilitates the transfer and creation of detailed, nonroutine, and complex knowledge (Hansen, 1999; Reagans & McEvily, 2003; Uzzi, 1997), the development of coordinated solutions and joint problem-solving (Uzzi; Cummings & Cross, 2003). The existence of strong ties within and across units within the larger organization has also been found to be associated with initiating and sustaining large scale efforts and inattention to the creation of such structures has contributed to the failure of reforms (Cooper & Markus, 1995; McGrath & Krackhardt, 2003; Tenkasi & Chesmore, 2003).

Lateral connections across subunits, such as grade levels or subject area departments in schools, facilitate the exchange and creation of complex information and novel knowledge building the organization's overall ability to assimilate and replicate information from external resources or what is known as "absorptive capacity" (Cohen & Levinthal, 1990). The capacity of a group to absorb information has been found to be directly related to the information that the group is able to produce and therefore to its capacity to create and innovate (Balkundi & Harrison, 2006). Thus, structures that support lateral ties across subunits will not only increase their individual absorptive capacity but the organization's ability to innovate and push forward overall reform processes (Tsai, 2001).

Literature presented in this section on social networks indicates that centralized networks are optimal for the effective dissemination of routine information throughout an organization and for individuals' opportunities to access privileged information. Dense, distributed networks have been found to be ideal for the transfer and creation of complex knowledge and collaborative problem solving that drives organizational change. In the field of education, SNA has been used to study the networks of school district leaders (Daly, in press; Hite, Williams, Hilton, & Baugh, 2006), principals (Friedkin & Slater, 1994), school teachers (Penuel, Frank, & Krause, 2007), and subject-area departments (Lima, 2007; Spillane, 2006). This study builds on findings from the social network perspective along with contextual factors identified by functional social capital to address the research gap on social network studies focusing on 21st-century curriculum development. The study offers a detailed exploration of the professional relationships

among teachers with the shared task of developing higher order thinking school curricula as guided by the IBO.

Together the two bodies of literature presented—distributed leadership theory and social capital—offer a solid holistic foundation for studying the actors, social processes, structures, and artifacts activated by the development and implementation of the International Baccalaureate curriculum. These frameworks offer a way to think about and study models of schools from which specific and useful conclusions can be made about how to support educational innovation and move it forward in the 21st century.

Distributed leadership offers an understanding of schools' functioning that goes beyond the heroic leader notion by focusing on the specific leadership actions and context that guide instructional innovation. It allows us to visualize diverse leadership distribution configurations in schools that may provide important insights into their role and effectiveness. As it was argued in this review, the notion of social capital and social network theory can be a powerful complement to distributed leadership by bringing the role of social and professional relationships among teachers within the school as an essential component to the design and implementation of innovative instruction. The exploration of IB teachers' curricular work guided by this literature sheds light on what this innovative effort looks like on the ground and it adds to the research on the distribution of instructional and administrative leadership and on the role of social capital in educational organizations.

CHAPTER III
Methods

The first chapter of this study presented the critical importance of researching in depth the work that teachers do when they systematically develop higher order thinking and holistic instructional curricula—such as the International Baccalaureate's Middle Years Program (MYP) and Diploma Program—for the development of new models of education that incorporate new understandings of human learning and address present social challenges. The second chapter reviewed the literature on distributed leadership and social network theory laying them out as novel and suitable frameworks for the understanding of the collaborative and instructionally related processes that guide the design and implementation of academic programs. This third chapter will explain the research design and methodology used by this study to explore the design and implementation of the MYP curriculum at a Venezuelan K-11 IB school.

Through a distributed leadership and social network framework, the study explored the ways teachers work in collaboration when designing and implementing higher order thinking skills curricula such as the IB's, along with the conditions that are in place for them to do so effectively. The following research questions guided this study:

1. How is the task of IB curriculum planning socially and situationally distributed in this school?
2. In what ways has the implementation of the IB program supported or constrained leadership distribution around in this K-12 school

3. In what ways do existing social networks support and constrain the work of teachers and administrators around (IB) curriculum in this school?

Research Design

The research design of the study is an embedded descriptive single case study of the MYP covering 6th to 9th grade in the Juan XXIII K-11 IB School in Valencia, Venezuela. The study utilized the embedded case study approach to explore the work of school members as they developed the IB master curriculum and designed instructional units following the IB's emphasis on an interdisciplinary school experience.

A case study is defined by Yin (2003) as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 13). This design is ideal for the study of complex social organizations like schools and the intricate processes that occur within it by allowing the researcher to take a holistic view of the situation and by focusing on the way a specific group of people within a shared context, in this case administrators and teachers in one school, performed a specific task, the design of MYP curriculum.

Descriptive case studies in education present detailed accounts of the phenomenon being researched. This design is helpful in presenting foundational descriptions that can become part of an empirical database for future comparison and the development of theory. A well-designed descriptive and exploratory case study strives for a holistic and context-sensitive lens, two of the major themes of qualitative inquiry and of this dissertation (Patton, 1990). An important strength that a case study design brings to

the research is the opportunity to use multiple sources of data, which allows the inclusion of a broader array of issues and more detailed account of their context (Yin, 2003). Collecting from a variety of data sources also strengthens data triangulation, increasing validity and reliability of the study's findings (Patton, 1990; Yin, 2003).

Context

The International Baccalaureate

The International Baccalaureate Organization (IBO) was created in 1968 in Geneva, Switzerland, with the initial purpose of creating an international curriculum for internationally mobile high school students that would prepare them to access any university in the world considering critical cultural perspectives that would promote global understanding. The International Baccalaureate (IB) program was an innovation championed by several international organizations including UNESCO and designed by notable education policy makers and skillful teachers from around the world.

The IBO has become a leader in the field of K-12 education by developing programs that stimulate students to have an active approach to learning, to be global citizens and to act in the world in a responsible way. The IB has undergone remarkable international diffusion and growth with its programs being implemented in 2,445 schools around the world in 131 countries and educating 667,000 students from 3 to 19 years old. Since the addition of the Primary Years Program (PYP) and Middle Years Program (MYP) to the original Diploma Program (DP), the IB has evolved "from a program for international schools, to an international program for schools." Its success and applicability in different national settings has frequently been tied to its focus on the

young global citizen, its breadth-depth balance, academic rigor, and effectiveness in preparing for college studies.

The IBO's guiding pedagogical philosophy is captured in its IB learner profile (Appendix A) and its mission statement, which reads that through the program its students "will learn how to learn, how to analyze, how to reach considered conclusions about man, his languages and literature, his ways in society, and the scientific forces of his environment." Schools implementing the program aim to "develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect." To this end the IBO offers an academic framework covering Kinder to High School constituted by the three distinct, sequential programs mentioned before (PYP, MYP, and Diploma) to promote the development of higher order thinking, communication skills and a global mindset in students enrolled in its schools (Appendix B).

The first two programs, PYP and MYP, are curricular frameworks. Schools implementing them have the freedom to develop it in accordance with their cultural and societal priorities and for the inclusion of the specific national content and requirements. One of the greatest challenges and strengths of these programs is the "creative professionalism" (Hargreaves, 1994) to experiment and innovate with pedagogical practices, which is promoted and expected from its teachers. Teacher teams are expected to collaborate in the design of their own content and strategies relevant to the school's context. These two programs are expected to have the flexibility needed for the inclusion of all students and to address a wide variety of intellectual needs and ability levels.

Curriculum design in the PYP follows what is considered to be a transdisciplinary model of teaching and learning. Concepts and abilities from the traditional subjects (mathematics, language, arts, natural science, social science) are integrated to create learning experiences where students are engaged with multiple and interrelated perspectives. They do so around six transdisciplinary themes: (a) who we are, (b) where we are in place and time, (c) how we express ourselves, (d) how the world works, (e) how we organize ourselves, and (f) sharing the planet. Students explore these themes through *units of inquiry* focusing on a central idea chosen and developed by teacher teams. Together the units of inquiry form the school's program of inquiry expected to be developed and articulated horizontally and vertically in collaborative form by its teachers.

The MYP, whose design this study is interested in exploring, has an interdisciplinary approach to its pedagogical philosophy and curriculum. Interdisciplinary learning is understood as the students' ability to grasp diverse bodies of knowledge and to integrate concepts, methods and modes of thinking from two or more disciplines to explain phenomena, solve problems, and develop points of view. Although the MYP has eight subject areas that are more clearly defined with prescribed aims and objectives than in the PYP, the program is strongly guided by five areas of interaction that are shared by all subject areas (Figure 3.1). These areas of interaction (approaches to learning, community and service, human ingenuity, environments, and health and social education) emphasize knowledge as an integrated whole and are expected to develop higher order thinking skills along with broad and global perspectives.

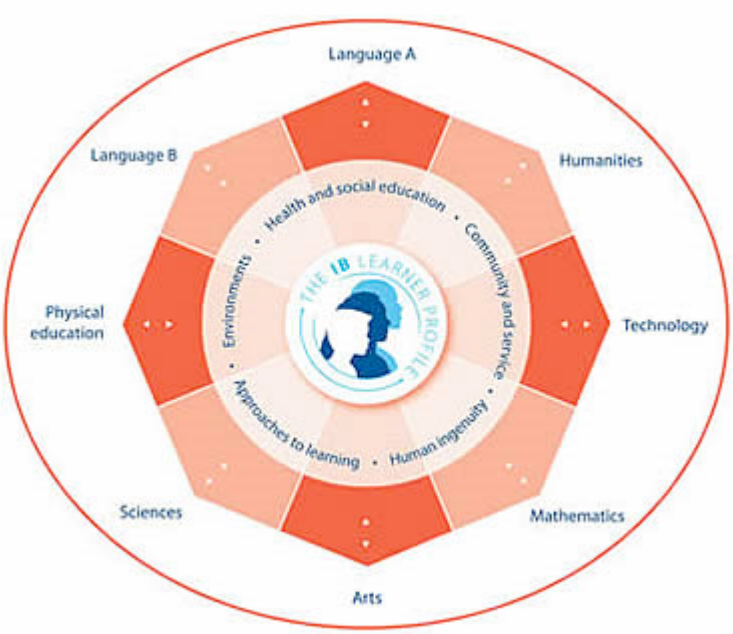


Figure 3.1: MYP Model

Interdisciplinary learning, as the core feature of the MYP curriculum, is expected to be present in teachers' units of work, student work, and their assessment. Planning of units of work should begin with a consideration of the concepts to be taught through the lens of the areas of interaction. In terms of curriculum, the IBO leaves subject content and organization completely up the school and its teacher teams as they are to collaboratively design the curriculum master plan and individual units of work that will enable students to meet the program's prescribed specific learning objectives per subject. This study will focus on this design process and early stages of ties implementation.

In succession, the PYP and MYP, in addition to achieving the objectives specific to each program and to the students' developmental stage, are also to prepare students personally and academically to engage and be successful in the more rigorous precollege

Diploma Program. The program is organized around six subject groups (native language, second language, individuals and societies, experimental sciences, mathematics and computer science, and arts) from which students select six subjects, one from each group, to study during the final two years of high school along with their participation in three core areas: Theory of Knowledge, which is designed to provide coherence by exploring the nature of knowledge across disciplinary areas; community involvement through the Creative, Action, Service (CAS) area; and the completion of an extended essay, where research and writing skills are to be developed.

In comparison to the PYP and MYP, the Diploma has a larger extent of prescribed content for the subjects offered giving less flexibility to teachers in this regard. Although interdisciplinary lessons are still encouraged, especially through Theory of Knowledge, as is the inclusion of additional content and activities, each subject should cover all contents expect to be assessed in the final examination administered by the IBO's central office. The more rigid and single-discipline nature of the Diploma is designed for students to start making the transition to a university education both on an academic and personal level. The cohesive yet distinct nature of all three IB programs presents an excellent opportunity for research to study how teachers collaborated around curriculum design as required by the them while at the same time allowing to explore how the differences in structure and philosophy between the PYP, MYP, and Diploma Program impacts teacher curriculum work.

Juan XXIII School

The school where this study took place is the Juan XXIII IB School, a private school in Valencia, Venezuela. Private schools in Venezuela serve approximately 35% of

the student population and are in general accessible to families from low-middle class socioeconomic status and upward. Juan XXIII School serves 2,200 students with grade cohorts of around 140 students divided into four grade-level sections. The majority of its students come from middle and upper-middle class socioeconomic backgrounds and live in the surrounding neighborhoods in the northern region of Valencia where the school is located. This K-11 school started implementing the Diploma Program in 1997, the PYP in 2004, and at the time of the study was in the midst of designing the MYP for its implementation, which is the process this study seeks to explore. The school is divided into three sites nicknamed: Juancito (K to 2nd - PYP), Juanito (3rd to 5th – PYP), and Juan (6th to 11th - MYP and Diploma Program). In addition to the school's academic and administrative principals, each of these sites is run by a site coordinator. There are three IB coordinators, one for each of the programs, in charge of curriculum planning and implementation who are supported by grade level and subject-area coordinators.

Rationale for Studying the MYP

Because this study's intent was to explore the work that teachers do as they set out to design innovative and challenging academic curricula, it focused on the in-house development of the MYP to be implemented from grades 6th to 9th at Juan XXIII. At the outset of the study this process was in its initial design phase which provided a timely window into the school's effort to develop the program. Development of the MYP is particularly interesting because it involves the challenging task for single subject-area teachers to collaborative work and plan curricula across disciplines for an authentic implementation of the program. The MYP also presents another interesting feature in that it represents the bridge from primary school to the precollege years of high school. This

is even more so in the school studied since the MYP grade levels function in the same site, side by side with the upper levels of high school covering the Diploma Program. In fact, MYP and Diploma Program teachers are integrated and work together in the form of formal subject-area teams where they make decisions on a vertical manner across grade levels. This makes Diploma Program teachers an essential component of this study since it is virtually impossible to separate their work from the MYP's.

Participants

Participants in this study were the 63 teachers (including 6 area coordinators, IB coordinators, and the two school principals) that are part of the MYP and Diploma Program functioning in the Juan site of the Juan XXIII IB School and who were involved in the MYP curricular design. All teachers were asked to respond to a Social Network Analysis survey and formed part of the pool to be selected as interview participants.

Data Collection

To explore and understand the curriculum work and instructional leadership that occurs in this school as they implement the IB programs, this project used four main methods of data collection: 1) Social Network Analysis (SNA), 2) interviews (Holstein & Gubrium, 2003; Yin, 2003), 3) participant observation (Spradley, 1980), and 4) document review (Merriam, 1998).

Social Network Analysis

The first step in the collection of data consisted of an on-line SNA survey (Appendix C) administered to all teachers and coordinators involved in the MYP and Diploma Program. The survey was administered a second time at the end of the school year after one year of MYP implementation to measure the evolution of relevant social

networks during this period. In addition to initial consent by Juan XXIII principals to conduct this research, a one-hour professional development session around the concepts to be studied and the data collection methods to be used was presented to all teachers and support staff in the school. At the end of this session voluntary participation in the study was requested. All school staff from the grade levels to be studied agreed to participate in the study by providing a signature in a form explaining in detail the extent of their participation in the data collection process and an email address to receive and access the SNA survey (see Appendix B).

The survey was designed and completed online through the Survey Monkey website, guaranteeing confidentiality under a password only known to the researcher. The survey was based on a "bounded" approach to network data collection to secure a more complete picture of the network and more valid results (Scott, 2000). A bounded network survey provides the respondents with a list of individuals in their organization—as opposed to relying on participant memory—for them to check the frequency of different types of interactions with colleagues.

Based on the distributed leadership and social capital frameworks, the survey measured three distinct networks representing relationships associated with higher organizational and school performance: curriculum collaboration, flow of IB information, and effort recognition (Cross & Parker, 2004; Lin, 2001; Krackhardt, 2001). Instrumental and expressive relationships were measured as they are both key for team performance (Lin, 2001). Specifically participants were asked to quantitatively assess their relationships with each of the other school members within their site on a frequency basis ranging from 0 (no interaction) to 4 (1-2 times a week). The survey took approximately

30 minutes to complete. Follow up emails and incentives resulted in 100% teacher participation rate in the network survey (see survey in Appendix A).

Interviews

Following initial analysis of the networks measured, interviews were conducted with the two school principals (academic and administrative) and the two IB coordinators involved in the MYP and Diploma Program using semi-structured interview protocols (Patton, 1990; Spradley, 1980) for an estimated time of one hour (see Appendix D). Also guided by a semi-structured interview protocol, six teachers in the subject-area coordinator position and, based on network centrality, a total of twelve teachers, two per department, were interviewed around curricular work in their respective teams (see Appendix E). Centrality refers to how many ties an actor either initiates or receives in relation to the specific network being examined and therefore is often thought of as an indicator of influence over the system. Networks centrality scores were divided into quartiles teachers will be selected from the 1st (least central) and 4th (most central) quartile. This will allowed the selection of respondents who represent informal (by centrality) positions in the network securing a variation in perspective based on network position. Examining the actors that have influence (more central) and those on the margins (less central) provided an overview of networks perspectives and therefore may be very useful in understanding the overall diffusion of resources through the network.

While the quantitative data represented by SNA measures informed this study on the structure, frequency, and strength of the interactions among school personnel around IB curriculum; the qualitative data through interviews and observations allowed collection of information on the actual content; and context of these interactions. The

interview covered the social and situational aspects of IB curricular design and implementation of the MYP, as well as the professional and collaborative relationships among school members that support it. Interview questions were designed to gauge the nature of the MYP curriculum design process following the distributed leadership and social capital frameworks that guided this study. Participants were asked to describe the process of design of the curriculum master plan, their routines and resources for unit planning, as well as their patterns of communication, collaboration, and support with school teachers and administrators. Interview questions were previously piloted in a different group of IB teachers after which they were revised and refined after consultation with the cochairs for this dissertation.

Observations

The third method of data collection used in this project was the observation and documentation of school meetings where administrators and teachers participated in planning and designing the MYP curriculum. Planning meetings were be observed, recorded, and analyzed using an observation protocol (see Appendix F) developed from Spradley (1980), Lofland (1995), and Miles and Huberman (1994). Data collected was coded according to the focus of this study and triangulated with information from the interviews and school documents to identify emerging themes across the different sources.

Document and Artifact Review

A final but extremely important data source for this project was the different school documents, teachers' planning artifacts, and tools that constitute a critical part of curriculum development. Each document gathered in the data collection was reviewed

and analyzed. Yin (2003) maintains the most important use of documents is to corroborate and augment evidence from other sources in this case teacher and administrator interviews and observations pointing to the use of these artifacts. Review of these artifacts and tools is also important to understanding and unpacking constitutive elements of distributed leadership. Content analysis (Merriam, 1998) was the systematic procedure used for describing the content of the relevant documents collected.

Data Analysis

A comprehensive data analysis plan weaving together social network, interview, observation and document data was developed to maximize use and triangulation of the data collected. Each of the types of data and the analysis performed for each is described in detail.

Social Network Analysis

At the school, subject-area and grade level, three distinct networks were examined: curriculum collaboration, flow of IB information, and effort recognition. Recognizing the importance in the literature of ties in networks strength of ties and stable structural patterns were taken into account in network analysis (Krackhardt, 2001; Marsden & Campbell, 1984).

While the data collection process rendered social networks at various frequencies of interaction, we chose to focus on the most frequent interaction patterns within each of the reform networks. These interactions typically represent stable structural patterns (Krackhardt, 2001) and respondents are more accurate at identifying ongoing patterns than determining occasional interactions (Casciro, Carley & Krackhardt, 1999). In order to be considered a frequent tie individuals would have had to interact once every two

weeks to a couple of times a week (3 and 4 on the rating scale). A series of network measures were conducted using the UCINET software (Borgatti, Everett, & Freeman, 2002) on each of these frequent relationships (curriculum collaboration, flow of IB information, and effort recognition) to better understand and compare network structure in schools and grade levels. Changes in the general structure of school ties occurring during the longitudinal period covered by this study were analyzed using the SIENA version 3.3 software (Snijders, Steglich, Schweinberger, & Huisman, 2009). This software carries out statistical estimation of models for repeated measures of social networks allowing the identification of significant changes and influential variables.

The *density* of area and grade level teams was measured to determine the percentage and total number of ties within each of the grade levels. The density of a network can be thought of as a measure of network connectedness or cohesion (Blau, 1977). Density is calculated as the number of connections between actors divided by the number of total possible connections in the network. The greater the proportion of ties between actors, the more dense the network. Density was scaled between 0 indicating no relationships between teachers to 1 where all teachers are connected to one another. A dense network is thought to be able to move resources more quickly than a network with fewer ties (Scott, 2000).

Reciprocity between teachers in subject area and grade level teams was measured to establish the percentage of reciprocal relationships within them as higher levels of reciprocity have been associated with increased organizational performance and complex knowledge exchange (Kilduff & Tsai, 2003). Reciprocity was calculated using a scale of 0 to 1, with 0 representing no mutual relationship present in the grade level team, and 1

representing a grade level team in which all relationships are reciprocated controlling for the size of the network.

For each of the individual actors, their normalized *centrality* in the social networks was calculated by determining the relative amount of ties an actor received and sent in each of the networks divided by the size of the network. Centrality was analyzed as network data to shed light on our research questions, as well as used for the purpose of sample selection, as described in the section on interview data collection. Network centrality measures can be used as an index of individuals' activity and role within the group. Highly central actors in a network have increased access to resources and a high potential to create new linkages that may enhance social capital and build organizational capabilities (Stuart, 1998; Tsai, 2000). Those who are less central to the organization may be on the periphery and receive less access to knowledge, and often do not have the opportunities to gain from the resources and information held by those in more central positions (Burt, 2000).

Quadratic Assignment Procedure (QAP) correlations were conducted in UCINET to determine the similarity between the instrumental and expressive networks and to assess the degree to which we were measuring different relationships. QAP correlations must be used to run correlational analysis on social networks as relations between individuals are nested and embedded within the same network. When conducting social network research, statistical assumptions of independence, on which Pearson correlations rest, are violated. The QAP correlation procedure computes a Pearson correlation coefficient between two corresponding cells of two matrices that contain network data. Then it randomly permutes the rows and columns of one of the matrices hundreds of

times (each time computing a new correlation coefficient), and compares the proportion of times that these random correlations are larger than or equal to the original observed correlation. A low proportion ($p<.05$) suggests a strong relationship between the matrices that is unlikely to have occurred by chance (Baker & Hubert, 1981).

Organizations undergoing important changes can sometimes become highly centralized when new knowledge such as the implementation of a new academic program is not equally shared. In order to determine the extent to which IB knowledge and curriculum design is centralized in the school studied a core periphery (CP) measure was conducted to understand the overall structure of its network. A CP network structure is defined as one with a dense cohesive central core of actors with less connected actors on the periphery (Wasserman & Faust, 1998). The CP measure compares an obtained network structure to a theoretically perfect CP model (completely centralized) and reports the correlation between the two. The measure is also useful in determining the degree to which actors belong either to the core or to the periphery, an important feature that determines how well they are able to access resources and participate within the school.

Qualitative Data

Interview data was audio-recorded and transcribed using InqScribe (version 1.5.2) software and Nvivo 7 software assisted with organization, coding, and theme identification of interview transcripts. The use of this software allowed for a systematic analysis and coding of qualitative data collected.

The study used the process of meaning condensation described by Kvale (1996) to interpret the transcribed interview. Responses were coded and grouped for comparison between teachers' perspectives and department curricular work. The first cut of interview

data analysis allowed important themes to emerge "out of the data rather than being imposed on them prior to data collection and analysis" (Patton, 1990). Qualitative data was analyzed using a constant comparative analysis method (Boeije, 2002; Glaser & Strauss, 1967) through checking and rechecking emerging themes (Miles & Huberman, 1994). This process of constant comparison "stimulates thought that leads to both descriptive and explanatory categories" (Lincoln & Guba, 1985) and provides a deeper understanding of the data. Emerging themes will be analyzed and reexamined looking for patterns across groups. Themes and patterns that emerged will be examined through the lens of distributed leadership, social capital, and social network theory.

Finally, content analysis was conducted on the data collected through documents, artifacts, and observation protocols using a thematic approach (Trochim, 2001) to examine patterns and deviations from the social network and interview data. This analysis identified significant themes and regularities, patterns, and dissimilarities resulting in a series of propositions in response to the focus of this study and the specific research questions posed (Miles & Huberman, 1994).

Limitations of the Study

This research study was valuable in generating descriptions of 21st-century curriculum design in action and proving the methodological and theoretical use of distributed leadership and social network theories. However, there are a number of factors that limit the scope and generalizability of this study, including: limited context and sample size, researcher positionality, and temporal concerns.

Regarding sample size and context, although the case of MYP design in the Juan XXIII School has provided important theoretical and practical insights, it is a case study

of a single school, which limits the generalizability of its findings. In terms of context, data were collected from a relatively small private school in Venezuela, which may further limit its generalizability to all types of schools implementing similar programs. Furthermore, although a wide array of teachers from all grade levels, subject areas, and network locations were interviewed, limitations to the qualitative data might arise from the impossibility to interview every teacher in the school. This may have led to some sample bias as the perception of some portion of the teaching population will not be collected, analyzed, or reported.

Regarding the scope of the study, the focus on the MYP program limits findings to this specific part of the larger IB program. Therefore, findings cannot be expanded to include the PYP or the Diploma specifically or the IB program as a whole. However, as expressed in the significance of the study, findings will be useful in adding to growing body of work focused on these programs and in building theory around distributed leadership and social networks in schools. Another limitation of the study involves temporal concerns. The study represents both a point in time for data collection as well as the particular developmental phase of the implementation of the MYP that was studied. Hence, findings may not be generalizable to all phases of implementation of this program.

Positionality. The final delimiter of the study is related to the positionality of the researcher. As the researcher is related to the principals of the school, there is the possibility that teachers and other interviewees may have somehow considered the interviews evaluative. In addition, teachers may have provided modified responses that represent what they believed the researcher wanted to hear. Given the relationship to the

principals of the school, the researcher may also have a "positive" bias toward data analysis and reporting. It should be noted however that the researcher's positionality does include advantages for the proposed research. The relationship between the researcher, the principals and the teachers allowed for complete access to all sources of data along with the time and resources that this represents for the school. Through presentations and individual conversations with school staff a level of excitement was generated to participate in the study.

The potential effects of the researcher's position on data collection and analysis were addressed in a number of ways. All interviewees were expressly informed about the exploratory character of this study which did not seek to answer if the IB works or not, nor to evaluate teachers in any capacity, but instead to find out the form and context of school collaborative relationships. The role that Dr. Janet Chrispeels and Dr. Alan Daly, cochairs of this study, had was extremely important in this regard. Their position as international researchers and university professors in the initial presentation of the project to the school was essential in reinforcing the independent nature of the researcher and the data collection processes potentially leading to openness on the side of participants. In addition, participants were informed of the extreme steps that were taken by the researcher to ensure complete confidentiality by creating a coding system for respondents and restricting access to data collected.

Attention to the aforementioned delimiters is critical in the way data is collected, analyzed, and interpreted. According to Merriam (1998), valid and reliable results produced in an ethical manner involve trustworthiness. Yin (2003) describes the enhancement of construct validity and trustworthiness of the study to be associated with

using multiple sources of evidence and establishing a chain of evidence, which is outlined in the methods section of this study. In order to address delimiters around data bias in this study, the researcher had other scholars familiar with the work review the data. Careful triangulation of SNA, interview, observation and document review data was also critical for uncovering any possible biases and to report consistent findings. This process met the requirements noted by Yin (2003) and allowed the reader to trace the research process, "from the conclusions back to the initial research questions or from the questions to the conclusions" (p. 105). The objective of this work is to ensure well-documented procedures that will enable others to replicate the study.

CHAPTER IV
Results

In light of the need to develop school models oriented toward 21st-century learning, the purpose of this study was to explore, through a distributed leadership and social network framework, the ways teachers work in collaboration when designing and implementing the International Baccalaureate (IB) Middle Years Program (MYP) curricula along with the supportive conditions that enable them to do so effectively. Data collection for the study consisted of: semistructured interviews with the MYP coordinator, six subject area department coordinators (hereafter referred to as area coordinators) and 11 regular teachers representing all subjects taught in the program; Social Network Analysis on teacher interactions around curriculum collaboration, IB information, and effort recognition; and observation of planning meetings and review of planning instruments and documents. Analysis and triangulation of these sources of data resulted in a number of important findings regarding the design and early implementation of the MYP program that will be presented in this chapter.

This chapter describes, from a distributed leadership and social network perspective, the actions and social processes that embodied the in-house design process of the MYP curriculum master plan. First, I present the three fundamental design tasks for development of the school's MYP master plan that emerged from the analysis of the interview data. These tasks reflected a variety of social leadership distribution, which defined elements of their enactment. Second, I explore a set of teacher support tasks centralized on the area coordinator and the MYP coordinator position, given their critical function to create conducive conditions for completion of design tasks. Third, I present a

social network analysis on the state and evolution of MYP collaborative relationships in grade levels and area teams over the past year to provide a deeper exploration of the social distribution of tasks and the factors supporting and constraining their enactment.

The K-11 school selected for this study and located in Valencia, Venezuela, is organized around two main structures: six vertical subject area departments (Math, Spanish, Natural Sciences, Social Sciences, English, and Entrepreneurship) and grade levels from kindergarten to 11th grade (last year of high school). This study focuses on the 6th to 9th grade implement the MYP. Each area department groups teachers by related subjects for instructional work (e.g., Natural Sciences department groups biology, chemistry, and physics teachers) and are led by an area coordinator, who is also a classroom teacher. The area coordinator, however, is assigned a higher number of administrative hours for teacher support and supervision. Table 4.1 illustrates the school's organizational structure and identifies the teachers chosen to be part of this study. The table shows the vertical structure by subject area and the horizontal structure by grade level (interdisciplinary teams), which as will be shown were both critical structures in the accomplishment of the tasks and the implementation of the MYP program.

Table 4.1: School Organizational Structure

		Math	Spanish	Natural Sc.	Social Sc.	English	Entrepreneur.	
Middle Years Program	6th gr.	Interviewee	Interviewee			Interviewee		MYP Coordinator
	7th gr.	Interviewee		Interviewee	Interviewee			
	8th gr.		Area coord.			Interviewee	Interviewee	
	9th gr.		Interviewee	Interviewee			Area coord.	
Diploma Program	10th gr.	Area coord.		Area coord.	Interviewee	Area coord.		Diploma Coordinator
	11th gr.	DP coord.		MYP coord.	Area coord.			

The school has a significant history of engagement in the IB pedagogical philosophy through the implementation the IB college preparation Diploma Program covering the last two years of high school for the past 10 years and the Primary Years Program (PYP) from Kindergarten to 5th grade for the past 5 years. It was a logical next step to implement the MYP. This study focuses on the school staff's preparation to receive the IB's accreditation for the MYP program. For the past two years, school leaders have reinforced IB pedagogical and planning processes, sent teachers to official MYP national and international trainings and created the IB-MYP coordinator position for these middle years, 6th to 9th grade. The final step in this organizational phase was the design and development of a curriculum master plan required by the IB for its implementation. This master plan is the product of the integration of the MYP's model, its areas of interaction for learning and annual student objectives with national and school-level curricular content and other requirements specific to each school's context.

MYP Design Tasks

A fundamental step in this study's analysis of the school's MYP design was identifying the distinct organizational actions or "tasks" that embodied the process of master plan development. Based on teachers' description of the process, observations and document review, three tasks were found to be fundamental is assembling the school's master plan for adoption of the MYP. Each of these tasks illustrates sequential and foundational steps taken by faculty to develop a school curriculum that meets the pedagogical philosophy and requirements of the IB. First, I will I give a general overview of these tasks followed by an in-depth analysis of each of them.

The first action enacted towards designing the MYP master plan was *reorganization of subject content* across grade levels and the school year. This foundational step was taken as a direct response to the higher learning expectations of the MYP compared to the national curriculum and to the need to create academic coherence with the Diploma Program already in place. Content reorganization was also perceived and used by teachers as an opportunity to update instruction based on their expertise. The social distribution of this task, the who and how of its enactment, was shaped by the formal structure of subject area departments where teachers worked as a collaborative unit to make decisions about content redistribution. Within area departments area coordinators played a critical role as discussion guides and moderators of collective decision-making. The outcome of this task was a vertical content plan from 6^{th} to 9^{th} grade for each subject area laying the foundation for the next step in MYP curriculum design.

The second action, taken once the vertical content plan was finalized, was the alignment of subject area content with MYP objectives prescribed by the IB. Because the IB only prescribes final learning objectives per subject, content is left up to the school and its teachers to organize to fulfill these objectives. Teachers described this process as a complex and time-intensive endeavor requiring the development of the pedagogical links between assigned content and MYP's learning objectives that were to become the basis for subject learning units. In contrast to the collaborative form of Task 1 where decisions were team-based, the task of content alignment was performed by teachers in an independent manner with a supervisory role played by area coordinators. Individual teachers were in charge of aligning their respective content for each grade level given that

as a rule a single teacher taught a subject area for all 5 sections of a specific grade. Completion of this task added the MYP's student competencies dimension to the content vertical plan rounding out the creation of the curriculum master plan.

The third and final task aimed at designing the school's MYP framework was development of the interdisciplinary nature of the program through areas of interaction and interdisciplinary learning units. MYP's pedagogical philosophy aims at a systemic orientation to student learning that considers the interrelated nature of disciplinary knowledge and real world applications. The master plan created by Tasks 1 and 2 mapped all subject content and objectives per grade level enabling teachers to take the first steps in creating lessons that integrate different subject into common themes that promote and apply interdisciplinary understanding. Unlike Tasks 1 and 2, interdisciplinary planning is expected to be a continuous and evolving action during implementation of the MYP. The social distribution of this task was highly collaborative and found to be bound by grade level teams since only teachers sharing a common group of students were in position to create joint interdisciplinary lessons. However, as opposed to Task 1 where all team members worked together at a specific time, not all grade level teachers were involved at designing one particular lesson. Social distribution was found to be highly fluid with a variable number of teachers deciding to work together at different times to develop common learning units. A number of factors were found to influence teacher collaboration patterns around this task such as existing collaborative relationships, perceptions of content adaptability, and teacher buy-in.

The following section of this chapter will be organized around the three tasks outlined above. Based on qualitative data collected, each task will first be defined by its

purpose, the rationale behind its enactment, followed by their social distribution and the school factors identified to shape distribution patterns and task enactment. Social distribution of tasks will include the qualitative aspects of its social configurations as well as relevant social network maps and variables to be presented in the last section of this chapter further illustrating their configuration and evolution in the past year.

Task 1: Reorganization Of Content Across Grade Levels

As the school faced the challenge of creating its own MYP master plan, the first action teachers took toward design of a school curriculum that met IB requirements as well as the nationally mandated Venezuelan curriculum was to reorganize subject content across grades 6^{th} to 9^{th} covered by the program. Teachers repeatedly referred to redistribution of subject content as the first necessary step in design of the new program. Rationale for the primacy of this task followed two main reasons as reported by teachers: the need to meet MYP's more demanding learning objectives, and the need to create academic coherence for students as they enter the Diploma Program.

Meeting MYP's more demanding learning objectives. It was widely perceived by teachers and coordinators that the learning objectives set out by the IB for all subject areas in MYP grade levels were of a higher academic level than what the national curriculum requires of students. The need to achieve these more demanding objectives was found to have led area departments to make vertical adjustment to the subject content being taught in each grade level. Like most teachers interviewed, a math teacher commented on the need to reorganize content to meet MYP objectives saying,

> We had weekly vertical meetings by subject area where we started to look at each grade level's MYP objectives and the national curriculum. While doing this we realized that some national requirements were on a lower

> level than what the MYP asks for so we had to move down some content, from 7th to 6th grade and from 9th to 8th for example.

To address this disparity, decisions were made to move certain advanced topics to lower grade levels (e.g., Math Department moved equations from 9th to 8th grade), to build earlier scaffolding for advanced understanding (e.g., Social Sciences and Spanish started covering essay standards and APA norms from 8th grade), and to add new and up to date content to the curriculum (e.g., Geography included issues around global warming).

As will be explored further in this study, the role of the MYP coordinator was key in initiating content redistribution in all subject areas by openly recognizing this need and providing the structures, tools, and support to do it. She stated the importance of reorganizing content when designing the new master plan,

> Emphasis was made on meeting the depth of MYP's objectives and the national curriculum as well, that a balance exists between the two. In looking for this balance, our teachers found that the level of expectations for students in the MYP is a lot higher than the national curriculum. In the beginning they were worried that a 6th grade student couldn't meet the objectives. We talked about the content that we had covered successfully so far and tried to give them confidence in the work. That took the biggest investment of time on my part.

School faculty and its coordinators acknowledged the challenge before them of designing and implementing a more demanding academic program and took action by making adjustments in the order and sequence of content covered from 6th to 9th grade. Simultaneously, these decisions addressed a second concern expressed by teachers regarding academic coherence and continuity after the MYP.

Creating academic coherence for students as they enter the Diploma Program. The second reason teachers decided to reorganize content as the first step in creating the

MYP master plan was the need to improve coherence and academic progression toward the Diploma Program. Because vertical area teams in charge of reorganizing content included teachers from the upper Diploma Program grade levels there was a strong concern in these teams that the MYP would prepare students appropriately for the challenging college preparation program that follows it. Most teachers expressed their interest in establishing better coherence between these two programs and that the first step to achieve it was to re-examine and reorganize content taught from 6th up to 9th grade. This seemed to be particularly important for teachers in the 9th grade (last year of MYP) and the 10th grade (first year of Diploma Program) who frequently referred to the need for coherence. A 9th grade math teacher commented on the importance of the Diploma in their MYP planning,

> Knowing what the Diploma Program needs as they enter it, we had the task of giving the MYP continuity towards it. The content covered up to the 9th grade needed to be congruent with the skills they will need to complete the Diploma.

Many decisions regarding content distribution were made in response to the level of expectations of the Diploma. MYP and Diploma teachers recognized the need for students to reach an academic level at 9th grade that would allow them to be successful during their final two years on the Diploma. A 10th grade biology teacher said,

> We met as subject area team and revised the content in a way that the MYP and the Diploma were connected coherently. It has to be a whole; we couldn't develop an MYP curriculum without taking into account what the students need to know as they enter the Diploma. So I was specially working closely with the 9th grade Biology teacher and our area coordinator making sure that our content had an appropriate sequence.

Teachers in the 10th and 11th grade were actively involved in making their expectations clear for students coming into the program. Concern for coherence and continuity lead to

changes in the vertical distribution of content mostly by moving it down to lower grade levels to have better prepared students entering the Diploma and eliminating redundant content.

While the task of reorganizing content was a critical step in design of the MYP master plan to meet demanding learning objectives and create internal program coherence, it was also found that teachers perceived this process as an opportunity to update their courses and to include new, innovative material and ideas that would help achieve new learning expectations. A Spanish teacher captured this common view, pointing out that,

> The goal was to plan each grade's content to meet the MYP objectives and not get into repetitious content and the mere act of memorizing. We also wanted to revamp the curriculum content taking into account what has worked in the past and bringing in updated information adapted to our time.

In fact, according to teachers the most important factor when decisions were made on content placement was teachers' experience with it, whether it had been successful in the past at the current grade level or if it was considered to be appropriate for a lower or higher grade level. Teaching experience and subject mastery were highly regarded throughout the design process and even though it was generally described as guided by team agreements there was a sense of deference to those teachers perceived as experts. An 8th grade teacher described this,

> In the end consensus was reached guided by those teachers with the most experienced in the specific content being discussed. The teacher who has been teaching 8th grade for years and years knows what type of problems there have been and is in a better position to decide whether to add more content or not.

As this quote shows, the task of reorganizing content was enacted by teacher teams working together and relying on each other's expertise to make informed decisions. Because this study seeks to understand how MYP design tasks were carried out from a distributed leadership perspective, an essential component to this understanding is the social configuration and social dynamic of its enactment.

Social distribution. A constitutive element of leadership tasks such as the design tasks identified in this study is the way in which individuals involved in its enactment interact with one another for its achievement. This section will explore the social configuration and dynamics around this task to provide deeper insight into how teachers worked to produce a reorganized vertical content plan for the school.

In regards to school actors actively involved in the task of content redistribution across grade levels, data from interviews, social network analysis, and observations conducted indicate that decisions were made collectively by teacher teams as opposed to mandated from school administrators or other individual decision makers. Moreover, the main school unit where curricular decision-making took place was found to be subject area departments composed of area-specific teachers from each grade level covering 6th to 11th grade, one of which served as area coordinator. It was these vertical area teams who collaboratively decided what content was going to be taught in each of the grade levels for the MYP.

Area-department autonomy. Data collected suggests that school administration granted area departments and its coordinators the autonomy to guide and ultimately make decisions on vertical content distribution and as will be seen later on its alignment with MYP learning objectives. School principals and IB coordinators

repeatedly alluded to area coordinators and their teams as the experts on their specific areas, which from administrators' perspective gave them the power to make critical decisions in curriculum design. The MYP coordinator referred to area departments' decision-making power on her interview,

> Our area coordinators have a lot experience in the classroom and the IB program so they have an established leadership with their teams. In no way would I or could I intrude in that leadership or intervene in their decision making as a department because I am not the specialist in the subject. I give general guidelines but they have that autonomy and I respect it. I give teams pointers and certain goals but in no way do I intervene in the decision making as an area department.

Area coordinators also recognized their position as one of great influence on program design and academic outcomes in the school. Decisions regarding teaching practice including content, pedagogical activities and assessment ultimately fell to area coordinators and their respective teams. The math coordinator, commenting on the extent of their decision-making, said,

> We are given great respect by the principal and administration. Decision-making at the top comes from us, from the base, when it comes down to curriculum. Nothing is imposed on us. We make curricular changes that they readily accept and if they have any suggestions or changes they let us know. There is flowing communication and a huge respect. With that in place we have been given that freedom.

Data reveals a school context in which area departments are granted a great deal of freedom and power in pedagogical decisions. As was indicated, this empowerment seems to be largely based on administrators' recognition of their expertise and deep knowledge of their respective subject area. This area department structure and autonomy allowed for enactment of MYP design tasks, in particular those dealing with vertical planning, to naturally occur within them and follow their internal social dynamics.

Collaborative decision-making. Regarding area department interactions for development of the MYP's content vertical plan, teachers consistently described the entire area team as the one collectively making curricular decisions based on open discussions of what was to be achieved in each grade. A history teacher described it,

> We definitely had to work in teams to deal with the distribution of content. We would lay out all of our content per grade level and study it as a team to make decisions, what do we move up or down? Which content is too repetitive? All those discussions we had as area teams.

There seemed to be a high degree of openness to share past lesson plans and teaching experiences with specific content in these discussions. Multiple teachers recounted during interviews how teachers would bring their unit planners and textbooks to weekly meetings for the rest of the team to use and make informed decisions about where and when content would make more sense under the new program. A Spanish teacher described a process common to all teams,

> In our department we all sat together in a table, put out our planning sheets together and from there we would make changes, moving in, out and around. We would have these discussions based on how the content had gone over in past occasions.

As the quotes presented before show, teachers described this process as one ruled by consensus, where all teachers had a voice and where knowledge and experience about students' needs provided the basis for decision-making above power positions. A Spanish teacher pointed out that,

> In general decisions were made by consensus. We always studied the situation together and decided together, always considering the students and their maturity level. Nothing was imposed just for the sake of it; issues were always presented for the whole team to decide with the students' needs in mind.

Data indicates that teachers perceived this first phase of MYP design to be a collective and participative process based on their respective area teams. Using Spillane's (2006) terminology, the social distribution of this task was to a significant degree "stretched over" all members of these area departments. Teachers within them were clearly active participants and decision makers on what was to be the final articulated MYP vertical curricular plan. However, data collected also elucidate that leadership activity, although distributed and participative, was not equally stretched over all actors for this task. Mainly, the role of area coordinators—as it has been pointed out before—stands out in the social dynamics that led to completion of Task 1.

Area coordinators. An important finding on the social distribution of Task 1, and which will be explored in more depth in the following sections, is the guiding role that area coordinators took on this task. Every teacher interviewed made explicit references the role of the coordinator being an essential one facilitating department discussions on the distribution of content. A comment from the MYP coordinator describes the role area coordinators played,

> Leadership was definitely carried out by the area coordinator in this process. They guide its direction in the sense that teachers voice their opinions for example saying "I think this content is too abstract for 8th graders", the coordinator guides the discussion and in the end a decision is made where the coordinator probably has a lot of weight based on their experience.

As it was established previously, area coordinators, despite their positions of power, did not dictate the outcomes for a new distribution of content across grade levels; however, discussions within area teams were not just free-flowing conversations among teachers. A good deal of task structure, goals, and deadlines were provided by area

coordinators who in turn had to personally provide finalized outcomes to IB coordinators and school administration. It was the area coordinators who were ultimately accountable for a quality and timely subject area master plan. In the face to these responsibilities, area coordinators acted as facilitators and advisors to teachers' discussions on curriculum. Their status as experienced teachers (all area coordinators have been teachers for at least 15 years), established instructional leaders and having been integral part of the creation of the school's Diploma Program were all factors that positively enhanced their influence among teacher colleagues.

Through exploration of this task it starts to be apparent that even in this highly participative and collaborative process a centralizing force was also present providing support and direction to teams' efforts to construct a vertical curricular plan. Area coordinators' highly supportive role seems to indicate that goal-specific tasks such as this are continually sustained by other leadership actions, in this case centralized on area coordinators, that structure and channel them towards standards of quality such as the IB's and timely delivery. Analysis of the role of these supportive actions in a later section of this chapter, as well as SNA data, will help clarify and bound the degree to which leadership is actually stretched over regular teachers within area departments.

Task 2: Aligning National Curriculum And MYP Objectives

After the task of content reorganization was completed and a vertical curricular plan set for the MYP program, the second step was to establish the explicit connections between the content assigned to each grade level and the competencies required by the IB in each subject area. This consisted of analysis of objectives and competencies required

of students in each grade level accompanied by careful selection of the content laid out by Task 1 that would achieve each objective. A biology teacher explained this task,

> In this task we are guided by the MYP final objectives. For example, one of them states that in Natural Sciences the students will be able to analyze critically the impact of science in society. Well I look for content in Biology such as contamination, biospheres, or even genetic manipulation to achieve the objective of my boys and girls being able to have a critical attitude towards the impact of man and science in the world. And so every teacher in every area did this for each objective and wrote it down for the master plan.

Teachers reported this alignment task to be time intensive and one to which they had to dedicate their entire focus to be able to assemble strong and practical links between content, classroom strategies and the subject's learning goals. Even though there were experienced teachers with many years of experience and IB training, alignment of content and MYP objectives was still considered by new and veteran teachers alike as a complex and challenging task due to the nature and high-level of the objectives. An entrepreneurship teacher described it,

> For this part, aligning the content with MYP objectives, we needed to sit down and think about it deeply. We know the content and we know the competencies but to link them you have to think about it, you can't just select them a priori. There are about 20 that you can select from that could relate to the activity or content you are covering so you have to plan it carefully.

For this task teachers expressed a shared concern with being thoughtful in making meaningful connections between content and objectives for the master plan, which had to be approved by an IB committee for implementation of the program. Adding to the complexity of the task, an equally important concern expressed by most teachers was not only that IB standards were met but that national standards were also met and not forgone or supplanted by the MYP. In terms of the alignment task this meant that content

established by the national curriculum needed to be used in its entirety and maximized to meet the new program's objectives. A teacher delineating his team's priorities during the process expressed this point,

> The first thing in our minds was that there was a real connection between the national high school program and the MYP because our students will need both to get admitted and do well in college. We cannot forget the Venezuela curriculum because it is the one that is widely recognized by our national system and universities. That was one of our most important concerns, that both the Venezuelan and IB program were covered.

In sum, the second task enacted in designing the MYP master plan built upon the content vertical plan created on Task 1 by aligning content assigned to each subject with MYP's learning objectives by creating pedagogical links among them. Teachers' main goals in this task were to establish quality alignment that would be approved by the IB while also meeting national curriculum standards in the finalized master plan. The time-intensive nature of this task and single teacher responsibility for each course led to social dynamics and collaboration levels markedly different than Task 1. The social distribution section will illustrate the ways in which teachers worked to achieve the desired content-MYP objectives alignment.

Social Distribution. Faculty interactions around the alignment task illustrate important differences in its nature and enactment when compared to the reorganization of content described previously. As opposed to the collaborative form of Task 1, alignment of content and MYP learning objectives was a much more individual process for teachers involved. Given that in general there is only one teacher per subject area per grade level, (e.g., one math teacher is in charge of all 7th grade math instruction), the responsibility of matching content with IB objectives fell entirely on teachers as individuals. Virtually all

teachers described this task as an individual one, including the IB coordinator who indicated that while "…during vertical meetings they distributed content from 6th to 9th grade in collaboration, after that - because there is only one subject area teacher per grade level - each one prepares his own grade level...Belkys assembles hers for 6th, Daniela does 7th, Julia does hers for 8th and so on..." At this stage, teachers worked independently from each other during team meeting and administrative hours to assemble their corresponding area and grade level curriculum. This task took what under distributed leadership would be called a "collective" social distribution in its enactment.

Although Task 2 was performed by teachers separately, it was found that there was a high degree of one-on-one supervision and collaboration between teachers and their corresponding subject area coordinator. After teachers had completed their subject's alignment, it was the area coordinator who had the final approval on the content-objective alignment developed by each teacher. During interviews teachers indicated that coordinators supervision and support was crucial to developing quality and practical connections to be implemented for MYP lessons. A Spanish teacher talked about this important source of support,

> [Content and objective alignment] was a complex task because it was the first time we did something like this… However, we had a lot of guidance. Not only did we rely on IB guidelines and the national curriculum but we also had the direct support and advice of our area coordinators. They have been teaching for so long and are not only very knowledgeable of the national curriculum but are also experts in the IB programs. So for example, in Spanish class one of our MYP objectives is that we want our students to be excellent communicators, we needed to align the specific content and strategies that would help our students achieve that objective. My coordinator would give us guidance about the most appropriate content, how it might overlap with other objectives, what class activities I could use and so on…

As was indicated before, area coordinators' extensive expertise in the IB program and their wide recognition as the school's natural instructional leaders allow them to steer MYP design in its different steps. In this case, their collaboration with on curriculum alignment was done on one-to-one, teacher-coordinator conversations. As a teacher described it,

> Each teacher would get together with our coordinator and we would evaluate the work we did on the master plan. Using the format that we assembled we would consult with the coordinator who knowing a lot about the MYP would tell us 'I think this is to advanced' or 'This needs to be more adapted towards the IB'

Task 2 and its social distribution suggest that the process of MYP design is constituted of sequential actions whose enactment will depend on different social configurations. The goal and context of the task shape the school strategies put in place for their completion. In this case, teachers' subject *ownership* over entire grade levels and time constraints seems to have led to more individualized enactment. Although Task 2 can be considered a highly distributed action given that all teachers were actively involved, its distribution was atomized by teachers working separately from each other and collaboration reduced to teacher-coordinator interactions.

Task 3: Developing Interdisciplinary Instruction

One of the most important components of the IB philosophy is its emphasis on interdisciplinarity and systemic approaches to teaching and learning. For implementation of the MYP teachers face the need to collaborate with colleagues on planning and implementation of lessons across subject areas. Thus, the third task observed in the final phase of design of the MYP was teacher development of areas of interaction across areas and the joint planning of interdisciplinary learning units.

The development of lessons with a systemic focus and interdisciplinary connections was kicked started by the finalized master plan produced by the two tasks described previously. The distribution of content and its alignment to MYP objectives formed the foundation—the curriculum master plan—for collaboration across subject areas aimed at developing common learning contexts and the integration of knowledge. Once the master plan was in place teachers in grade level teams were able to systematically review the content and objectives being taught during the school year for each subject area to identify interdisciplinary lessons that could potentially be developed.

Under principals' instructions and in order to move forward on MYP implementation, when the master plan was completed weekly meetings switched from subject area to grade level teams. Teachers started to meet as grade levels to develop interdisciplinary lessons and strengthen their areas of interaction. An explicit attempt was made by administration and recognized by teachers to focus strictly on instructional planning as opposed to the nuts-and-bolts issues that usually dominate grade level meetings. A teacher said emphatically "the administration's instructional goal is that planning is done on Wednesday by grade level. That we sit to plan together and nothing else but lesson planning." An 8th grade teacher further described the goal of grade level meetings,

> During our Wednesday horizontal meetings every teacher comments on what they are going to do, what they are preparing, the content to be covered and MYP objectives. While each teacher presents their material we are all looking for connections or ways in which to involve more than one subject, once we do we start organizing these activities. Sometimes it involves 2 areas, sometimes 3 or maybe more. We are working so that the student doesn't see subjects as isolated from each other.

Teachers were then provided with a weekly two-hour meeting for grade levels to work on the program's interdisciplinarity. According to data collected this type of work represents the most significant shift in how teachers regularly do business in this school. To plan interdisciplinary lessons meant that teachers had to—many for the first time—step outside the boundaries of their subject area and work in collaboration with grade level colleagues to develop and implement common units. This required a change in attitudes regarding total control of the pedagogical direction and emphasis of these lessons as well as adapting to a new group process for lesson planning. A science teacher reflecting on this commented,

> We are aiming towards more interdisciplinary activities. This trimester I worked for my interdisciplinary units with Math, English, Art and Spanish. So my planning has to be much more open than before so that other teachers can also assess students according to their criteria as well as mine. We need to make time to cover the content each wants to include and come up with inclusive activities together.

Similarly to Task 1, teachers consistently described the process as an open collaboration in which teachers in grade levels would bring ideas, discuss them, and select the most appropriate to implement. Teachers with ideas for interdisciplinary units would bring them to horizontal meetings where colleagues would discuss ways in which their respective subject area might overlap or connect with the desired lesson. Teachers would integrate their subject into the lesson based on the content to be covered and the MYP criteria to be evaluated, which was then formalized into a unit planner containing all participating areas.

However, Task 3 also appears to be a more fractioned one than the ones previously described. Rarely did the whole grade level participate in designing a lesson.

In addition to contextual constrains to be discussed later, participation seems to have been determined by how appropriate each teacher perceived their content for the interdisciplinary unit being planned. Planning seems to have revolved mainly around subject content that was perceived as malleable and adaptable to other areas' objectives. A 6th grade teacher summarized this idea,

> In 6th grade we hold our meeting where everyone at the table brings the content they are going to work with. Teachers that already have ideas on how to connect their content to other areas' usually lead the interdisciplinary planning. Then other areas open to the same objectives support it. We would listen to the content they were going to cover and if there was content from my plan that connected with the rest then that was the moment to modify our plan, we would make any changes needed and design the interdisciplinary activity.

It is important to note that in addition to the fluidity of teacher teams involved in it, interdisciplinary planning was also highly variable across grade levels. Triangulation of interview data, planning documents, and social network data to be presented in the last section of this chapter indicates that this task was enacted with significant differences among grade levels. Social distribution of interdisciplinary planning will illustrate the different forms through which it took place and the factors that shaped teacher participation in integrating subject areas into common learning units.

Social distribution. While the social distribution of the first two tasks seem to have been strongly shaped by formal school structures and relationships, such as the subject area departments and the teacher-coordinator relationship, collaboration on interdisciplinary planning—although bound by grade levels—was found to be much more fluid and fragmented. A selection of learning units developed in the first half of the school year illustrates the fluidity of teacher collaboration in this task:

- Art and Spanish (7th grade): Students developed a short story in which Spanish emphasized the narrative aspect and art focused on the story's illustrations covering different artistic styles.
- Art, Spanish, and history (8th grade): Students represented historical events through a comic book story. The history teacher evaluated the sequence and explanation of historical events; the art teacher focused on the use of color, form and lines, and comic styles; while Spanish guided and assessed written dialogues.
- Biology and technology (9th grade): Using Corel Draw, students designed a model of the human body and the endocrine system studied in biology.

- All subject areas (6th grade): School trip to Binary World. Math worked on binary numbers, science worked on technology, Spanish worked on syllabic structure and short essay on key words form the trip, social studies worked on the role of technology in the world.
- All subject areas (6th grade): School trip to a petting zoo. A narrative for Spanish. Science covered the relationship between animals and ecosystems. English worked on animal and environment vocabulary. An integrated guide was completed by students.

As can be observed, the interdisciplinary examples presented correspond to efforts of different combinations of teachers working together in a common learning unit. Regarding the distribution of roles in these efforts, teachers involved were not reported to take formal leadership position from where they would direct or supervise design and implementation of the interdisciplinary unit. During interviews, teachers who participated

in interdisciplinary planning consistently reported a sense of team decision-making in this task. The role of the area coordinator seemed to have much less prominence in this task when compared to the guiding and supervisory role they were found to take on in Task 1 and Task 2. Within a less structured context, a number of factors were found to influence patterns of teacher collaboration in Task 3. To illustrate these factors two cases of highly collaborative teams will be presented in the following section.

Instructive cases of interdisciplinary collaboration. Building pedagogical bridges across disciplines and designing interdisciplinary lessons is critical to fidelity and overall success of the MYP as intended by the IB. It is through this practice, among others, that the program represents an innovative approach to prepare students for an interconnected 21st century. However, the transition for teachers from an individualized and single-discipline focus to collaborative lesson design was also found to be the most challenging. As opposed to the vertical and horizontal consistency of the two tasks described previously, this challenge resulted in a relatively high degree of variability in interdisciplinary planning across grade levels and subject areas. The degree to which teachers are experienced in lesson collaboration, program buy-in, established informal collaborative relationships and other factors seemed to play an important role in the variation found.

During analysis of interview data, interdisciplinary documents, and social network data, two teams recurrently stood out as exemplary cases of interdisciplinary collaboration. Given the potential to learn from them and to illustrate the conditions that were found to promote interdisciplinary instruction in the school studied these two affirmative cases, a grade level team with frequent internal lesson collaboration, and a

subject area team that was found to be an important collaborative hub for teachers in all area departments, will be explored in this section.

Sixth grade. Among grade levels the 6th grade in particular stood out for the frequency and form of their interdisciplinary collaboration. The MYP coordinator and teachers from all grade levels interviewed pointed to this team as the one most effectively planning integrated learning units. The MYP coordinator—who in her spanning role promotes interdisciplinary planning—talked about the 6th grade team planning:

> I have noticed that interdisciplinary collaboration in the 6th grade is the most natural of all. They have the mentality already. The 6th grade is also used to working by projects and their form of evaluation is similar to the MYP, much more than from 7th to 9th. Two of the teachers have worked with the PYP [the IB's Primary Years Program] before and it has been easier for them as a whole to evaluate with the IB's criteria. Their communication across areas flows very well, personalities play a big role.

As a team, the 6th grade was at an advanced stage on the design and implementation of interdisciplinary learning units. The previous quote outlines several key conditions identified through qualitative and quantitative data to have enabled this team to perform at a high level on interdisciplinary instruction: a sensed of shared responsibility, previous experience with project-based learning, and frequent teacher interactions. Each of these conditions will be explained in the following paragraphs accompanied by the different demographics and contextual factors that supported them.

The first condition supporting interdisciplinary collaboration among 6th grade teachers was the team's sense of shared responsibility for student learning. Teachers repeatedly distinguished the 6th grade team as one where teachers believed that student learning was a goal that could best be accomplished by the team working together for all students at all times. Current and former 6th grade teachers expressed the uniqueness of

this team within the MYP referring to its close-knit dynamics in managing grade level instruction. As opposed to the more discipline focus of teachers in the upper grades, its teachers reported investing planning and class time to support understanding in different subject areas and "ensure students' overall growth." Teachers saw themselves working together as a "single unit for all 140 sixth grade students." This unique sense of shared responsibility might be related to two contextual elements of the 6th grade: first, the 6th grade is the last year of the Venezuelan system Primary School where students are the still in their preteen years. At this level, teachers seem to take more of a caretaker role of students than secondary level teachers where students are expected to be more responsible for their own learning. And second, the physical location of the 6th grade in the school is separated from the upper grade levels who all share common buildings. This appears to have led to a distinct and independent character in the 6th grade fostering internal team unity and interactions.

A second important condition present in the 6th grade team was its previous experience with project-based learning and its assessment criteria. Current and previous 6th grade teachers interviewed reported that interdisciplinary planning had been in place if somewhat informally before the MYP. Grade level joint lesson planning was to a certain extent already established as the way teachers worked in the 6th grade. Out of all MYP grade levels the 6th grade had developed the most interdisciplinary lessons previous to program implementation. An upper level teacher who previously taught 6th grade explained that the team had an established routine and an ease to plan together that other grade levels lacked. Sixth grade teachers consistently reported to be comfortable with interdisciplinary planning and were convinced of its effectiveness, one teacher expressing

this common belief saying "our team is completely convinced that [interdisciplinary planning] gives good results, it works better and students learn more." The national curriculum seems to have played a role in the team's readiness for interdisciplinary planning given that the structure of the Venezuelan curriculum required higher levels of collaboration among primary school teachers than for high school grade levels (7th through 11th). The process was also enhanced by the fact that two 6th grade teachers had taught in the PYP which has been implemented in the school's lower grade levels for 5 years. Similarly to the MYP, the PYP revolves around multidisciplinary units and its evaluation follows the IB model potentially easing the transition of the 6th grade into the MYP format.

A third and final team condition of the 6th grade that supported interdisciplinary instruction was the frequency and quality of teacher communication. Social network data, as will be shown, indicates the team as having the most dense and stable grade level interactions (instrumental and expressive) within the school. In addition, qualitative data points to the stability of their planning meetings as key to the 6th grade's communication and its interdisciplinary development. In comparison to upper MYP grade levels where a considerable number of teachers are part-time, all 6th grade teachers are full-time and exclusively dedicated to the school. According to an experienced teacher:

> In the 6th grade we would all meet weekly by level and all teachers are full time, and that's a big advantage. It makes a huge difference. By being full time you have more time to get together, to work together, sometimes while students were in PE we would meet just because we were all there. So we had that advantage to talk about how to complement each other's areas at different times.

While other grade levels faced the difficulty of having part-time teachers that often might not be present at grade level meetings due to commitments outside of the school, 6th grade teachers shared similar schedules and had no competing work commitments. They were all able to be present during interdisciplinary meetings and be involved in the discussion, which was not always the case in upper grades. As was referenced to before, the team's relative independence from secondary grade levels might have aided the team's unity and fostered the development of more frequent teacher interactions.

In summary, among grade levels the 6th grade presented the highest level of interdisciplinary collaboration and their experience offers insight into the grade level conditions that support it. Their work was found to be supported by three team conditions enabled by its particular context: a sense of shared responsibility built on students' developmental stage and the team's relative independence from other grade levels; teachers' experience on interdisciplinary planning through past efforts to integrate instruction; and the existence of frequent teacher interactions facilitated by team stability and full time commitment to the school.

Entrepreneurship. A second instructive case from this study on the team conditions that promoted interdisciplinary instruction comes from the entrepreneurship area department. Although all subject areas were involved at one point or another in interdisciplinary units, entrepreneurship was particularly and consistently referred to during interviews as a teacher nexus for implementation of these units. This department composed of a team of technology, commerce, marketing and tourism teachers who designed in-house programs for each grade level centered on the step-by-step

development of a service or product enterprise. Interview and social network data indicate that entrepreneurship also served as the most important source of support for other areas' interdisciplinary planning. Similarly to the 6th grade team, teachers interviewed reported a great deal of collaboration on lesson planning involving entrepreneurship, both as a driver of the learning unit and as support to other areas' units. Three conditions stood out in the entrepreneurship team as key to its central role on interdisciplinary instruction within the school: its teachers' previous experience in developing interdisciplinary programs, a departmental emphasis on real-life applications to learning and teacher accessibility to other area departments for lesson development.

The first condition that aided entrepreneurship active participation in interdisciplinary planning was, similarly to 6th grade, its teachers' expertise working on projects that incorporate different subject areas. Teachers expressed that entrepreneurship's pedagogical direction towards project-based, interdisciplinary learning was in place in the department before implementation of the MYP**.** The Developing Enterprise project and the tourism fair, both organized by the entrepreneurship team, required its teachers to integrate content and activities from other subjects such as chemistry, art, and geography before the MYP was in place. This experience seems to have prepared its teachers to take on the program's requirement to work across disciplines. In addition, teachers reported that implementation of the MYP has formalized and strengthened entrepreneurship's existing collaborative relationships with other subject areas as they are now required by its interdisciplinary focus.

The second condition supporting interdisciplinary planning in this team was its strong emphasis on project-based, real-life applications to student learning.

Entrepreneurship teachers saw their subject area as the backbone of the MYP's goal to form students with systemic views and problem-solving skills. One of its teachers, representing a shared view, described the role of entrepreneurship within the school,

> In the MYP we are trying to globalize the content we teach, to connect it to other subject areas. Our role in Entrepreneurship is to bring our students a sense of connection with the real world, with what actually happens in the working world. These applications always involve different fields working together so we are always integrating the work of other areas into our lessons. That's how I see our department contributing to the MYP.

Teachers expressed a clear goal to connect students' academic experiences to the work place and to real life situations. Entrepreneurship assessment was based on projects developed over the course of several weeks and involved a final product designed by the students applying the content and skills from different areas. Its teachers were particularly open to the idea of cross-discipline collaboration emphasizing that development of real-world projects required teacher participation from diverse fields. In addition to its ideal alignment with the IB's learning model, entrepreneurship's effort to root content on real life applications has been further promoted by a school-wide concern that students become motivated to learn the content. Teachers repeatedly identified the project-based approach as key to spark student' motivation and establish a connection to their future interests.

The third and final supportive condition to entrepreneurship's frequent collaboration with other areas was its teachers' high accessibility to colleagues seeking technological and design support for their lesson design. The area coordinator described the supportive role shared by her department colleagues,

> Entrepreneurship works together with other subject areas to achieve their learning goals. We don't learn technology for the sake of technology, we

> learn it to apply it, apply it to Biology, Math, Spanish, etc. So we provide the tools for students to apply it. If Biology needs to do graphing, we teach them how to do it. If they need to make a web page for a class, we work on teaching them that. We are always ready to respond to what other departments need

Interview data indicates that teachers had a strong disposition to support a wide number of colleagues—and according to social network data often did—on strategies such as the use of graphing software, PowerPoint presentations, market analysis, digital representation of biological models, and design of promotional posters. It was teacher expertise in these strategies and their openness to share them with other departments to develop common lessons that made the entrepreneurship department a frequently accessed hub for interdisciplinary collaboration.

Together, the two cases explored, interdisciplinary instruction in the 6th grade and the entrepreneurship team point toward a set of supporting conditions for implementation of this pedagogical practice. First, both cases indicate that previous experience among teachers in working across disciplines was critical for teams to establish routines to develop common units. It also became salient through these two cases that teams with a diversity of expertise and following a project-based approach were uniquely positioned to work across disciplines. Second, interdisciplinary instruction was supported by the belief from teachers it represents the most effective practice to engage students and expose them to real life scenarios that will maximize learning. And third, the presence of a dense and stable network of teacher relationships that enable effective communication and that supports collaboration on a frequent basis was found to be key for interdisciplinary lesson development.

In summary, the development of the school's MYP master plan was embodied by the three tasks described in this section: reorganization of content across grade levels, within grade level alignment of content and MYP objectives and the development of interdisciplinary instruction. Each of these tasks was implemented following distinct organizational and program needs described under each and which were found to impact the extent and form of their social distribution. Overall, the process of MYP design was a highly participative effort in which all teachers and coordinators were involved in making decisions that ultimately shaped the master plan. However, as will be explained in the next section, design tasks were critically supported by a second set of tasks that were found to be strongly centralized on area and MYP coordinators.

Coordinators Supportive Tasks

The area coordinator and MYP coordinator positions stood out during the process of master plan development by playing a critical role in guiding and supporting teachers when making decisions in all three tasks described previously. In this section I will explore the actions enacted from these two positions, which were found to be essential for teacher participation in the curriculum design process.

Area Coordinator Support

As was indicated before, area departments were the most important school unit for teachers' interactions, both for instrumental and expressive relationships as indicated by forthcoming social network data. Teacher offices and classrooms throughout the school are organized by area departments. Previous to switching to weekly grade level meetings, pedagogical planning used to be based on the area department. All day-to-day decisions regarding classroom instruction including content, strategies and any

pedagogical activities reside in area departments. According to school administrators, from grades 6th to 11th the most vital positions for the instructional direction of the school are those occupied by coordinators leading these area departments. As it was indicated in the first section, all coordinators have been teaching for at least 15 years, are all IB area-certified teachers and were part of the team that developed the Diploma program starting in 1997. This role seems to have been made more present and strengthened by design of the school's MYP master plan.

Before the MYP, due to time constrains area department meetings were often held at the same time as Diploma Program meetings, which prevented many area coordinators who taught in it from being present. This seems to have made area meetings somehow disjointed. The need to design the MYP curriculum—a process in which area departments were expected to play a leading role—required a stronger focus in these meetings; rescheduling and participation of their coordinators became essential for this goal. The MYP coordinator talked about this strategic shift:

> Area coordinators became much more involved because now they are fully integrated into the MYP. Before area meetings were run at the same time as the Diploma so many coordinators couldn't be there. Now we are organizing the meetings so that they are in the MYP curriculum planning. Before our MYP teachers didn't have their coordinators, we often had to bring them in from Diploma meetings because there were many decisions that had to be made about content or IB standards specific to their subject. Teachers feel better having them there because they provide so much support.

Teachers confirmed the crucial role of coordinators within their teams throughout all interviews. A great sense of respect was often expressed towards them and their expertise. This is reaffirmed by the fact that area coordinators ranked among the highest

rated teachers by their peers, administration, and students in the school's internal evaluations. A Spanish teacher referred to the central role of area coordinators:

> As a teacher I get the most support from the area coordinators. From them is where I get the most direct information, about IB requirements, the essays and such. I go to them because they have the experience of working with the program. They have read thousands of IB essays and know those little details. They have many teaching tools that they have proven to be effective and are always prepare to share them with teachers so we use them in the classroom.

School-wide teacher recognition of the rich source of IB experience and pedagogy that area coordinators represent paired with their readiness to offer it during team meetings, teachers' administrative hours, and informal conversations formed strong instrumental and expressive relationships between coordinators and their subject area colleagues. It was found that through these relationships, the area coordinator performed three main ongoing tasks dealing with teacher support: Lesson design and implementation, vertical cohesion, and socioemotional engagement.

Support for lesson design and implementation. Teachers reported that the most important role played by area coordinators was their assistance in developing lessons. Coordinators themselves also recognized this as one of their main responsibilities and took charge of their respective subject area's pedagogical direction. The area coordinator for social sciences summed it up saying that although "IB coordinators manage the program it is area coordinators who manage actual pedagogical practices. We guide teachers' on strategies, selecting the best form of assessment and how to meet IB standards." While the IB coordinator was in charge of big picture issues relating to the program, area coordinators worked on day-to-day teaching practices that directly impacted instruction within area departments. They are called to maintain direct contact

with classroom teachers to review and support their weekly planning as well as their assessment.

Area coordinators pedagogical support is framed within their role as instructional supervisors specifically through their evaluation of macro and micro planning instruments. Teachers' IB unit planners and the microlevel, weekly booklet are both submitted to their respective area coordinators to receive input and as proof of timely lesson planning. Coordinator feedback is communicated through these instruments and individual meetings with teachers are based on conversations around them. A math teacher talked about the use of these forms for coordinator input

> Area coordinators follow up on our lesson planning. In our "cuadernito" we write how we are going to teach their class, the whole story on the strategies that we will use and how they class will develop. Based on that they guide us, write suggestions to improve it and comments about things they might try. We have a lot of conversations about it.

Coordinator-teacher conversations around lesson plans revolve mainly around two areas: in-class strategies and assessment. Although coordinators largely recognize that lesson strategies are left up to individual teachers to make the class their own and respond to their own personal styles, coordinators were found to be an important influence on strategies aimed at student motivation (an important teacher concern), alignment to IB and innovation. As evidence of this influence a teacher commented,

> When I meet with my coordinator we talk about how to reach students, bouncing ideas on how to motivate them. We also talk about the central idea of the unit which is always a challenge and she helps look for innovative activities to achieve it.

This quote was expressed in different forms by many teachers who identified coordinator input and suggestions as the main source of support for the development of their lesson strategies.

In addition to in-class strategies, area coordinators were also influential in teacher development of assessment within the IB format. Implementation of the MYP brought about a change in student assessment by shifting to criteria-based evaluation that reflected the newly established MYP objectives as well as its interdisciplinary nature. Coordinators pointed to support of assessment design as an integral part of their role in shaping MYP instruction. The area coordinator for natural sciences expressed,

> One of my main functions is working with teachers towards the MYP is on the development of assessment, guiding them towards assessment that takes into account not only the recollection of facts but more importantly their capability to integrate and make judgment on those facts.

Teachers confirmed this reporting to receive regular support from coordinators on how to evaluate IB criteria, incorporate it into exams, and include areas of interaction during assessment. Unit planners, past exams, and student achievement data were all cited as tools that were reviewed with coordinators to design and improve assessment.

Supporting vertical cohesion. The second task performed by area coordinators was development of vertical cohesion within their respective subject areas across all grade levels from 6^{th} to 11^{th} (MYP and Diploma). Coordinators indicated that it was part of their job to work closely with teachers to create a coherent academic experience in which students were building on the knowledge and experiences acquired in previous years. The math coordinator emphasized that their role was "to create a natural progression and that nothing takes the students by surprise." This becomes crucial for a

demanding program such as the IB's Diploma and that will rely on the newly developed MYP experience. Data indicates that coordinators build department cohesion through team meetings and work with individual teachers by guiding a purposeful progression of content from year to year and the design of consistent assessment in all grade levels.

The area coordinator for social sciences illustrated what this means in practical terms. She explained how for her 11th grade history class they were studying the independence of Spanish colonies in America and the need for students in those final stages of the Diploma to be able to understand the unfolding of Latin American independence from a systemic and global point of view. Only a coherent academic experience where grade levels build up on prior years of learning can prepare students to achieve this level of analysis and performance in respective assessment. The area coordinator highlights her efforts to assist vertical coherence as one of her primary responsibilities,

> To achieve [coherence] one of my constant efforts is working with all teachers in the program to build up students' analytical skills to reach this final level when they graduate, that students understand knowledge as a tool and that they are able to analyze, more than memorizing dates. We can only do that by developing it throughout all grade levels.

Efforts to improve vertical cohesion have also been jointly undertaken by coordinators across different areas. The area coordinators for Spanish and social sciences, in collaboration with a Theory of Knowledge teacher, worked toward establishing uniformity in regards to essay writing and assessment, a fundamental aspect of both the MYP and Diploma Program. The following vignette based on the Theory of Knowledge teacher interview illustrates this coordinator effort towards building cohesion,

> "We found that there were students who were very good at writing essays for Spanish but not in Theory of Knowledge or the Social Sciences so our essay standards weren't really aligned. This would show when students would get frustrated when they weren't getting the same grades in Social Sciences papers as they were in Spanish in earlier grade levels. They didn't see it was a different type of essay. So we decided to work together on that, to focus on essay standards and APA norms in the earlier years."
> "Up to that point, the Social Sciences coordinator and I had talked about it a little bit but we were not connected to Spanish yet to make the necessary changes. There was also a lack of information on the side of teachers about what the differences in essays were and some of the weaknesses we had. So the design of the MYP curriculum gave us the chance to talk about it, go in depth in it and improve it.
> "The three of us, Social Sciences coordinator, Spanish coordinator and me met to discuss the issue and some materials on it. We decided to take it to our respective departments. We all have a good relationship in our teams so everybody reviewed the materials, the teachers for the earlier grade levels were very interested in it and thankful. They went and got some more information on it and we went back to discuss it as a department.
> "The outcome of this discussion was that we established new assessment criteria in the case of Social Sciences and an earlier focus on critical argumentation. We also decided to move towards assessing by drafts instead of just one version of an essay in all grade levels. As for Spanish, the outcome was a focus on APA norms and citation in the earlier grade levels of the MYP. We have improved a lot on it."

Socioemotional engagement. Although the instrumental support provided by area coordinators described above is critical to the development of the IB programs, the emotional support offered to teachers was found to be an equally important task. Coordinators play a mentor role to their generally younger teachers by offering advice and praise as well as being often sought out for help on personal issues. Teacher-coordinator relationships were frequently defined as based on mutual trust and professional respect. A Spanish teacher referred to these relationships,

> My coordinator and the teachers in our team have a very close relationship. As a leader she has promoted a team based on trust and respect. Treating everybody equally, rallying us personally, going after the same goals, offering advice.

Of special importance to teachers was that coordinators recognized their achievements and offered words of encourage. Teachers reported that coordinators would frequently praise effective lessons as well as innovative activities during team meetings as well as offer congratulations on personal accomplishments. A social sciences teacher said that,

> I really admire our coordinator because she is very attentive to details. She is just very open with a high human quality. She is constantly pointing out our strengths and things we do well. If you have a leader who relates to you only in a professional way but not in that human component, who doesn't share a personal conversation with you, you don't make an emotional connection. That part is very important too.

This quote also points towards the strong correlation between instrumental and expressive relationships expressed by many teachers and supported by social network data. The existence of strong expressive relationships seems to form the basis for teacher-coordinator instrumental relationships. They do so by building a trusting climate within the team that allows for greater commitment and collaboration on the side of teachers. A teacher expressed this shared view,

> What helps that working relationship with your coordinator the most is the mutual respect and trust between each other; the freedom and support to be the teacher you can be. There is a bond that is formed that makes you want to do well for them and not disappoint when there are academic or administrative requirements.

Coordinators perceived establishing and maintaining these expressive relationships as an integral part of their position. In addition to their instrumental capacities, they cited personal mentoring and trust development as indispensable to the achievement of departmental goals. The math coordinator explained that an important aspect of the coordinator role was "to create an atmosphere in which they are confident in

coming to me to talk about any issue, be it professional and personal, and know that we can discuss it." The natural sciences coordinator expressed a similar thought saying that "a lot of our work as coordinator consists of guiding teachers on our human relationships. A lot of them are very dry when they are new so we work to ease them in to our team and open up."

In sum, area coordinators individually performed a set of supportive tasks in favor of school implementation of the MYP program. First, they supported teachers' design of lessons by offering guidance on IB alignment and innovative classroom strategies. Second, area coordinators aided in developing vertical coherence across grade levels in the MYP and Diploma Program by building progressive pedagogical and assessment links among them. And finally, they engaged in socioemotional support with teachers by establishing expressive relationships through which they provided personal advice and praise teacher achievements.

MYP Coordinator

Implementation of the MYP saw the necessity to create a new IB-MYP coordinator position to oversee the program alongside the school area department structure. The MYP coordinator was found to be enacting key tasks in support of MYP design and implementation. As previously indicated the MYP coordinator strongly believed in the co-creation of the program and the relevance of teacher subject expertise. This was reflected in her hands-off approach with area departments, which have a high degree of discretion regarding instruction. Thus, the MYP coordinator role was focused on mostly administrative tasks relating to the program as well as creating horizontal

connections among the different subject areas. An area coordinator described the MYP coordinator's general role,

> The IB coordinator is in charge of all the logistics and the general information that comes from the IBO. She directs us in a general sense on the philosophy of the IB and making the program a whole. She also emphasized the areas of interaction a lot which was something new and pushed us to work across area departments for lessons.

This quote reflects that the MYP coordinator played a unifying role in the program both administratively and instructionally. This role consisted on enactment of three tasks during design and early implementation of MYP: to provide an administrative direction to the program, to impart the IB pedagogical vision and to promote horizontal connections among the subject areas.

Administrative direction. In comparison with the predominantly instructional role of area coordinators, the MYP coordinator was found to be in charge of all issues having to do with IB general guidelines, program changes, assessment schedule, teacher evaluations and other logistics. During design of the MYP master plan while all content decisions were left up to departments the program coordinator was involved in designing and distributing planning instruments that would be shared by all teams, setting deadlines for planning and providing general guidelines required by the IB. The main channel through which the coordinator did this was during faculty meetings preceding area department meetings and attended by all teachers. In these meetings the MYP coordinator would present information relevant to the current planning stage, share master plan examples from other schools and discuss different logistical issues. As social network data will also show the flow of IB-related information was centralized on the MYP coordinator.

In addition to acting as information disseminator, a second administrative action performed by the MYP coordinator was supervision of area coordinators and their respective departments. Area coordinators repeatedly stated to report frequently to the MYP coordinator regarding master plan development, IB alignment, and teacher planning. Through this supervision, the MYP coordinator becomes informed on the progress of all area departments and is able to provide feedback and suggestions to the different teams. An area coordinator described MYP coordinator supervision,

> We meet every Wednesday and are constantly in touch by email. I explain to her everything I am doing, things I a working on, I send it for her to read, she gives me input and approves it. The area coordinators are always in touch with her and sharing what we are doing. Her work is very intense because she keeps up with information from all departments.

The focus of MYP coordinator supervision of area departments was the collection and review of teacher lesson plans adjusted to the new IB framework. Teachers turned in unit planners and assessment to area coordinators who would then inform and discuss these plans with the MYP coordinator. This high level of supervision over planning has come about as a way to reinforce MYP implementation and the MYP coordinator noted on its effect,

> Before, I think many teachers felt a little lost while others thought that they could do whatever in class and the result would be the same. Now area coordinators and myself are following up closer on lesson planning and for many it has meant professional growth, lesson improvement, for others pressure, more work, I have had every possible reaction. But in the end is about understanding that is not because I say so but because better planning makes it easier in the long run and more effective.

Teachers interviewed, in particular new and younger teachers, appeared widely supportive of the MYP coordinator role and were appreciative of her directions and suggestions. Although some teachers did point to the increased amount of work and

deadlines that detailed and supervised unit planning has meant for faculty, its benefits such as tight connections to IB standards, consistent assessment, better class control and improved use of time were also repeatedly acknowledged.

Strengthening IB pedagogical vision. The second task enacted by the MYP coordinator can be seen as a more ethereal one compared to her more grounded administrative work, however her development and support of the IB pedagogical philosophy throughout the school turned out to be just as salient. It was her goal to motivate teachers to consider themselves MYP teachers at all times and not just during meetings or interdisciplinary lessons. She considered it crucial for teachers to perceive the program as embedded in their daily work and not as a parallel direction for them to follow. A biology teacher expressed the support received by the MYP coordinator,

> [The MYP coordinator] is always guiding and motivating us towards the program's final objectives. She is constantly reminding us of the great steps we have taken towards it, the positive outcomes of the program and how much is going to be worth doing it right. Although she is not deeply involved in actual subject her motivation is extremely necessary as well as her explaining why we are doing it so it is not perceived as just more work.

In addition to the curricular master plan created, MYP coordinator's work on developing the IB instructional vision revolved around a focus on the IB learner profile ("the most illustrative image of what we want out of our students") as the ultimate objective and a strong emphasis on detailed and thoughtful lesson planning as vital to its achievement. The MYP coordinator talked about the strong correlation between implementation of the program and teachers lesson-planning efforts,

> Right now students are asking, they are clamoring for teachers that are up to date, teachers that know how to use technology so you can't come in and bring the same old book and lesson plan. You are going to have a rude experience and are going to burn out. My job is to help teachers understand

> that planning is not the program's requirement for formality but a step to keep growing, because it helps you improve everything. The MYP unit planner is making you work with other subjects, making you plan in detailed and innovative way because if you don't you'll lose your students.

Promoting horizontal connections. The most direct instructional support offered to teachers by the MYP coordinator is regarding the development of areas of interaction and interdisciplinary lessons. She considers this an essential component that has to be developed for the school to be true to the MYP program, she expressed her main focus with teachers during planning is "stressing that the heart of the MYP is the areas of interaction among the subject areas and in the interdisciplinary work that is produced in their collaboration."

Teachers constantly referred to the MYP coordinator as the force behind school-wide efforts to work across disciplines under the new master plan ("Each of us is very well prepared in our subject areas but she makes us go in much more depth by guiding us in working together as a whole program"). She spans all area departments through constant communication and supervision, which allows her to build and develop the connections needed among them for interdisciplinary instruction. She does this by creating a consistent understanding of the areas of interaction, bridging subject content across area departments and offering concrete examples of interdisciplinary lessons during faculty and department meetings.

In summary, a number of supportive tasks performed by area and MYP coordinators were found to be critical for teacher active participation in design and implementation of the MYP program. On one level, area coordinators support lesson planning and implementation by giving input on effective and innovative classroom

practices as well as assessment adjusted to IB standards; they support vertical cohesion across grade levels by guiding a purposeful progression of content and assessment from year to year; and provide teachers socioemotional support by recognizing their efforts and offering support on personal issues. On a second level, the MYP coordinator acts as information disseminator on administrative and logistical issues related to the IB, she performs as supervisor of area departments' lesson planning, serves as active advocate of the IB pedagogical vision, and promotes the horizontal connections among area departments necessary for interdisciplinary planning. The final section of this chapter will further illustrate the social enactment of the design and supportive tasks identified in the previous sections through social network analysis and additional factors found to impact it.

Social Networks

Alongside distributed leadership, social network theory is the second theoretical lens adopted by this study to explore the social dynamics of design and implementation of the MYP. Through collection of Social Network Analysis data on teacher instrumental interactions around curriculum planning and IB-related information as well as expressive relationships measured through colleagues' recognition of each others' efforts this study is able to map out the teacher network structure of the school's design of the MYP. Network measures and teachers' patterns of interaction indicate several important findings: area departments were the main active unit during MYP design, significant variability exist among area departments networks, MYP implementation led a move towards grade level-centered planning, coordinators are significantly and increasingly

central in respective networks, and expressive relationships are significantly correlated with instrumental collaboration.

Area Departments as the Main Unit During MYP Design

Social network analysis shows that most interactions around curriculum planning in Year 1, when design of MYP master plan was in full swing, took place within subject area departments. Comparison of network density (a measure of degree of interaction), reciprocity (a measure of the amount of reciprocal relationships), and EI index (a measure of internal and external team focus) on curriculum planning between area departments and grade levels strongly indicate that area departments were the most active unit where teachers were working together (Table 4.2). Teachers would most frequently interact around issues of lesson content, strategies and overall curriculum with colleagues from their respective area department. Triangulation with qualitative data presented in the previous section suggests that the school's overall focus on vertical coherence and on subject areas IB alignment during MYP design made area department interactions necessary over other teacher collaborative relationships.

Table 4.2: Units network densities (curriculum collaboration)

	Area departments					Grade levels			
	Spanish	Social Sc.	Natural Sc.	English	Math	6th	7th	8th	9th
Density	0.3333	0.3194	0.4238	0.5714	0.3571	0.4667	0.1389	0.2857	0.2321
Reciprocity	0.25	0.4375	0.4355	0.7143	0.3636	0.4	0	0.2	0.1818

Complementing the patterns of teacher interactions and overall network structure uncovered by SNA, qualitative data revealed the nature of the content being transacted through curriculum collaboration ties. Dyadic instrumental relationships among area department colleagues were found to be mainly focused on exchange of classroom

strategies. Teachers reported to help each other by sharing innovative pedagogical activities ("whenever I fall into a routine I look for new things my colleagues are doing"), teaching practices found to be effective ("when we meet we always try to share things that are working in the classroom"), and resources such as texts, protocols, and software to be used in class. A second form of instrumental collaboration among teachers was focused on joint completion of planning forms such as the backward-design planner which represented each teacher's blueprint for upcoming lessons. Joint work on unit planners included the collaborative identification of overarching unit questions, areas of interaction, and appropriate unit assessment.

Area Department Network Variability

Although content transacted through collaborative ties and department dynamics obtained from interview data paint a relatively homogenous picture of departments' instrumental interactions with consistent area coordinator roles and teacher participation, SNA data shows that there were considerable differences in area teams' patterns of collaboration. A possible explanation for the inability of interviews to appropriately capture this variability is that half of the interviewees were coordinators who might have a similar perspective on the process given their position and that only one additional regular teacher per area department was interviewed which would not provide sufficient data to differentiate each team's internal dynamics.

Network densities within area departments are the strongest indicator of the different degrees of teacher activity in curriculum planning in each of them. Table 4.1 shows that while there were departments such as English and natural sciences where 57% and 43% of all ties were present and teachers seemed to have an active and frequent role

on curriculum collaboration, there were departments such as social sciences with only 31% of ties and presented a more centralized, coordinator-focused structure. Although all area coordinators can be statistically considered central in their respective networks, as can be seen in Table 4.3, their out-degree centrality (measuring the normalized amount of ties initiated by the individual) and in-degree centrality (measuring the normalized amount of ties received by the individual) indicates that their activity within their departments, and with it their role and influence, varied.

Table 4.3: Area Coordinators Normalized Centrality

	Within Department		Whole School	
	Out Degree	In Degree	NOut Degree	In Degree
Spanish Coord.	57.14	14.29	16.95	8.48
Social Sc. Coord.	87.5	62.5	27.12	23.73
Natural Sc. Coord	14.286	71.43	3.39	27.119
English Coord.	50	100	6.78	23.73
Math Coord.	33.33	66.67	5.085	22.03
Entrepren. Coord.	100	100	89.31	22.03

Area department differences can also be represented graphically illustrating the patterns of teacher interaction existing in each one of them as well as the coordinators position and degree of influence on the rest of the team. Figures 4.1 through 4.5 represent departmental curricular networks.

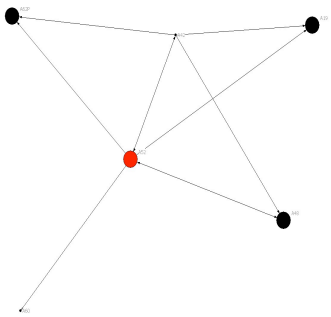


Figure 4.1: Spanish Department Curriculum Collaboration Network

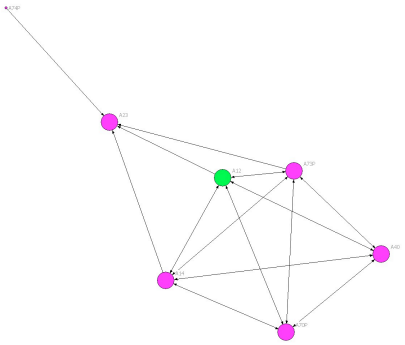


Figure 4.2: English Department Curriculum Collaboration Network

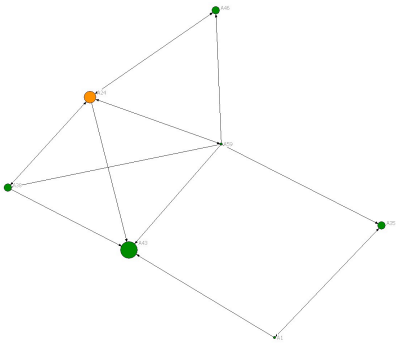


Figure 4.3: Math Curriculum Collaboration Network

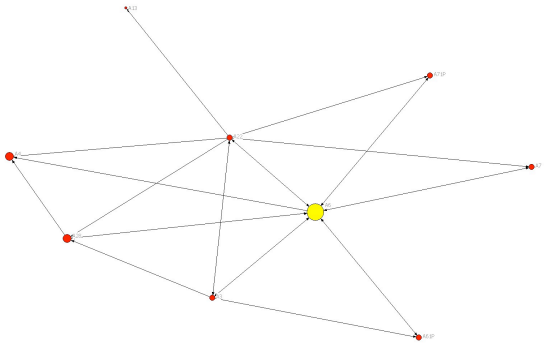


Figure 4.4: Social Sciences Collaboration Network

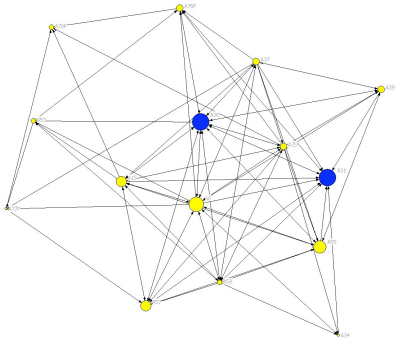


Figure 4.5: Natural Sciences Collaboration Network

A number of constrains at the school and teacher level were identified from qualitative data offering potential explanations for the less dense network structures and infrequent dyadic relationships that amount to the network variability found among area departments.

Team instability. One of the most salient constrains to the establishment of dense collaboration networks within certain area teams was the lack of a consistent group of teachers over time. Two specific causes were identified as contributing to team instability and in consequence to less dense teacher collaboration networks. First, a high level of teacher turnover in the past years seems to have eroded team's ability to establish stable networks. A science teacher lamented that "we have teachers that are here for 6 months

and then leave for jobs outside of education and this limits our work as a team." Network ties are lost with every teacher that leaves the school decreasing overall team density. A Spanish teacher further reflected on this common concern saying that "every time a teacher leaves we have new teachers coming in during the middle of the school year and is difficult for us to ask them to collaborate on unit planners when they don't know anything about the MYP." New incoming teachers are mostly unfamiliar with the IB programs and need to be trained, become acquainted with their teams, and inducted into school practices before they can become an active partner in collaborative lesson planning. Second, team stability was found to be negatively impacted by the presence of part-time teachers with competing job commitments. A math teacher referred to this limitation to team collaboration saying that "it's difficult to get the whole team together for an hour and a half a week when teachers have jobs in other schools and take off as soon as they are done to get to their other school." Part-time teachers were frequently reported to be less available to participate in end-of-day team meetings and have informal conversations that are crucial to collaborative relationships.

Teacher program buy-in. A second important constraint to the development of denser teacher instrumental networks was found to be teacher commitment to the MYP and collaborative lesson planning. While the majority of teachers were found to be enthusiastic about the program and the school's general pedagogical direction, they also reported that the presence of teachers within their teams resistant to move away from "teaching behind closed-doors" limited overall collaboration on instruction. A History teacher explained that,

> The IB invites you to grow as a professional, to improve, to work together to innovate class strategies and dynamics. An obstacle for some teams has been teachers that feel ok with the way things are, teachers that have taught their whole lives the same way and repeat the same classes year after year and refuse to change.

Although there doesn't seem to be a direct relationship between years in teaching and resistance to the program (coordinators were among the most experienced teachers in the school and repeatedly said to be "in love with the IB"), there were numerous references to the challenge *posed by older teachers to change their practices*.

To address teacher buy-in a strong impetus was found among coordinators to bring everybody into the school's collaborative vision. An area coordinator expressed this shared goal,

> We are trying to make everybody understand that lesson planning should not be individual and static. We want to work together to incorporate new strategies, new technologies. Trying to change teachers' mindset is a challenge but it is a big part of what we do and we try to engage them in a caring and supportive way letting them know we are going to do it as a team.

There seems to be a shared understanding among teachers that MYP implementation is an evolving process and there are high expectations for increased teacher collaboration as the program moves forward. The MYP coordinator concluded, "as we raise awareness and continue establishing a school-wide culture of joint lesson planning we will see the results on teachers' disposition to work together."

Multiplicity of administrative requirements. A third and final condition identified from qualitative data to constrain teacher interactions around curriculum was the multiplicity of planning forms required of teachers. According to several teachers the amount of time spent in fulfilling administrative requirements on lesson planning limits

their availability to work with colleagues during the school day on actual lesson development. These forms include the year-long curriculum plan developed for MYP, backward-design unit planners (time span varies), a trimester MYP work unit, an assessment plan and a detailed weekly booklet on classroom activities per lesson all of which are turned in regularly to area coordinators. An English teacher echoed other colleagues' opinion on the time spend on completing forms saying,

> One of the things that I think limits our time is that there are too many planning forms we have to complete. We have to try to simplify or integrate them because they become repetitive. We have to sit down and figure out a solution to redundancy in planning.

The MYP coordinator, while aware of the increasing time teachers spent on planning forms, argues that these forms are all part of the school's emphasis on thoughtful and purposeful lesson planning and building the foundation for future work,

> We believe that documents like the MYP master plan and the unit planners represent the permanence of the program. If the way we teach is only in teachers' minds if they get sick, or leave the school we are left in a state of disequilibrium because we wouldn't have the tangible materials that our work is based upon. Because of the high teacher turnover and the changes that are always going on there has to be a document for teachers to rely on. And in our case instead of these documents being imposed upon us we are asking teachers to actually them in collaboration. It is critical that we have something developed by us that stands in time and that later we can keep improving.

From the point of view of school administration planning forms serve the function of guaranteeing instructional stability and provide a blueprint for further evolution of the program. The MYP coordinator points out that these forms will become tools in the near future for the development of new interdisciplinary lessons based on objectives and activities contained in them. Although teachers mostly agreed on this point and perceived unit planners to be helpful in outlining their teaching, there was an evident push-back

from area departments against the growing administrative requirements for teachers. Resistance to the amount of planning paperwork is potentially due to the large amounts of time and energy spent this year on designing the master plan from (a one-time task) in addition to new unit planners and the recently implemented weekly booklet. Area coordinators, worried about teacher burnout and that growing administrative requirements would negatively predispose them to the MYP, have attempted to mediate between teachers and IB coordinators. The result so far has been the allocation of additional time exclusively for completion of planning forms. For the new school year it is also widely expected that pressure on teachers will decrease given that the foundation for MYP planning will have been laid this year and teachers will be able to focus on lesson refinement and interdisciplinary collaboration during their administrative hours as opposed to filling out forms.

In summary, social network data revealed significant variability in the frequency of teachers' interactions in area departments. Three main constraints were found to contribute to this variability: team instability caused by teacher turnover and part-time teachers, teacher program buy-in limiting engagement in collaborative practices, and the multiple administrative requirements that occupied teachers' time.

Shift Towards Grade Level-Centered Planning

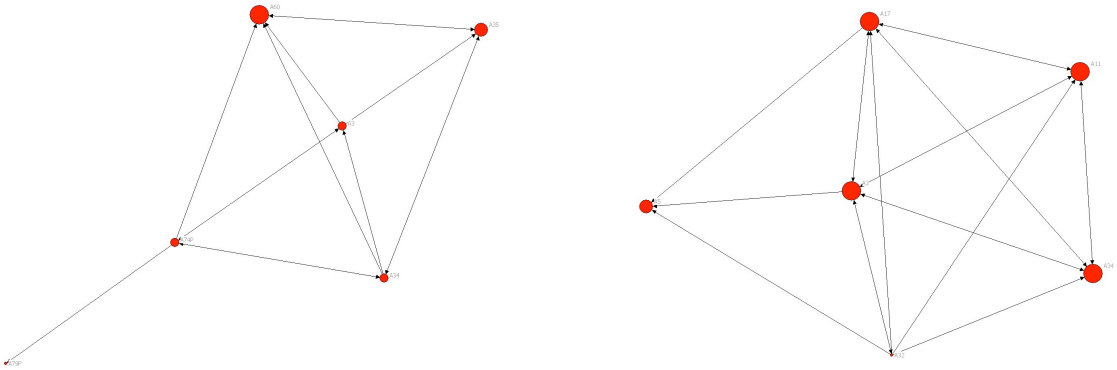
Longitudinal data documenting network evolution from Year 1 to Year 2 indicates that although area department densities of interaction around curriculum stayed relatively constant, teachers within grade levels were working together significantly more on lesson planning in Year 2 than in Year 1. Grade level densities saw an average

increase of 0.13 in their curriculum collaboration (Table 4.4). Individual teachers' interactions within their grade level also increased significantly from an average of 3.42 grade level ties per teacher in year 1 to 4.48 ties in year 2 ($p>0.01$). These findings suggests that while area team ties are still utilized by teachers to access information about subject-specific content and teaching strategies, grade level interactions have become as important for planning lessons in response to the interdisciplinary nature of the MYP.

Table 4.4: Grade Level Curriculum Collaboration Density Year 1 & 2

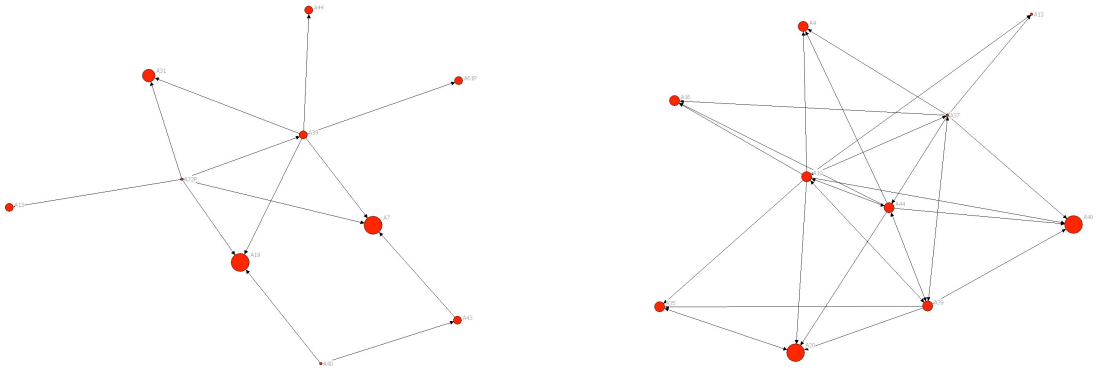
	Curriculum Collab. Density	
Grade Level	Year 1	Year 2
6th	0.4667	0.6667
7th	0.1389	0.3333
8th	0.2857	0.3036
9th	0.2321	0.3333
Avg.	0.2809	0.4092

Although grade-level, interdisciplinary collaboration was observed to increase overall in the first year of MYP implementation, social networks show significant differences in its form and development among MYP grade levels. While all grade levels from 6th to 9th saw significant increases in their curriculum collaboration densities, the 6th grade, confirming findings from qualitative data, clearly stood out in their interdisciplinary interaction with a .667 network density that more than doubled the rest of grade levels. Graphical representation of grade level collaboration in year 2 in Figures 4.6 to 4.9 illustrates this variability:



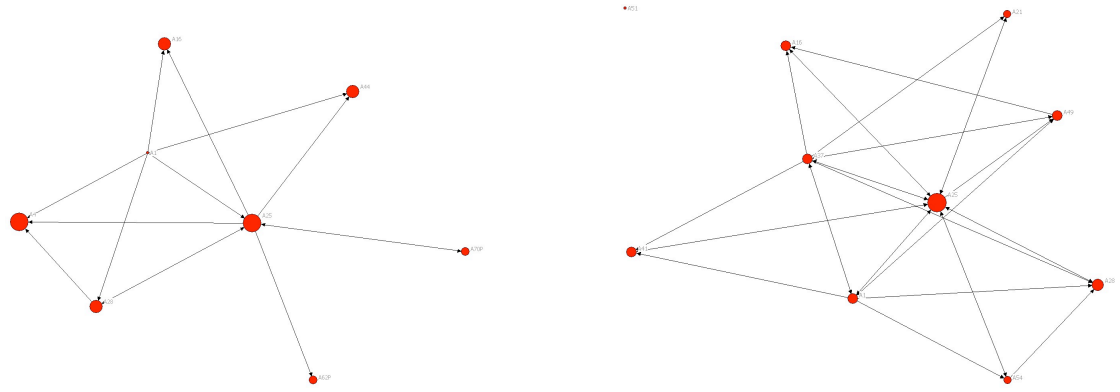
Year 1 Year 2

Figure 4.6: 6th grade evolution of curriculum collaboration network



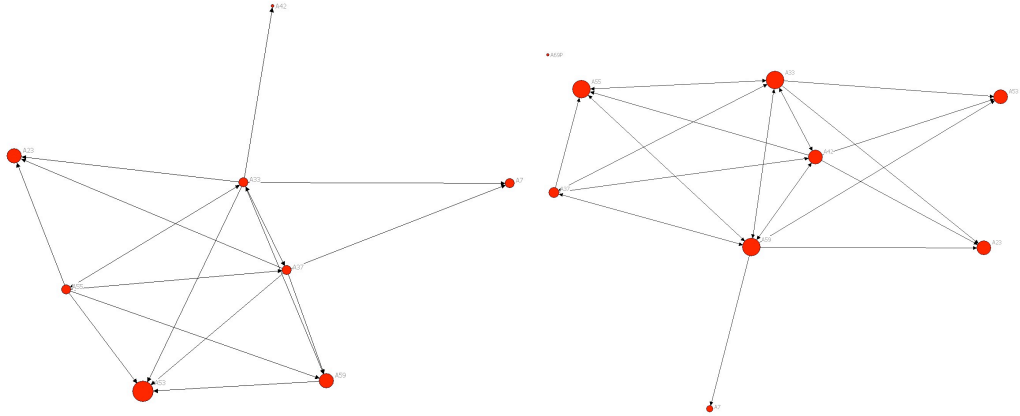
Year 1 Year 2

Figure 4.7: 7th grade evolution of curriculum collaboration network



Year 1 Year 2

Figure 4.8: 8th grade evolution of curriculum collaboration network



Year 1 Year 2

Figure 4.9: 9th grade evolution of curriculum collaboration network

In addition to illustrating teacher interactions in the highly collaborative 6th grade, social networks indicate that for the upper MYP grade levels the entrepreneurship team was in a particularly active position in support of interdisciplinary networks. While teachers in all subject areas were participating in lesson planning across area

departments, entrepreneurship teachers were accessed significantly more by teachers in other area teams for the development of interdisciplinary units. The team as a whole had the highest EI index, .804, of all area departments signaling a strong outward focus in their lesson collaboration (Table 4.5). Individually, entrepreneurship teachers had the highest average of external ties (23 external ties per teacher) than teachers in any other area department. Network representation of lesson collaboration from grades 7th to 9th in Figure 4.9 shows the central role the relatively small department, in bright green, played (color node indicates area department, node size indicates in-degree centrality).

Table 4.5: Area departments EI index

Area Department	EI Index
Spanish	0.500
Social Sciences	0.415
Natural Sciences	0.222
English	0.117
Math	0.482
Entrepreneurship	0.804

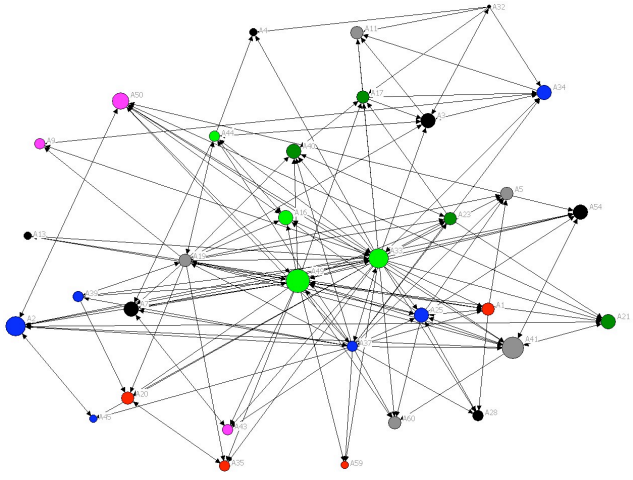


Figure 4.9: MYP Lesson collaboration network

Coordinator Centrality

SNA data indicates that social networks measured were centralized on coordinators. For the curriculum collaboration network, in-degree centrality indicates that, for the school overall and within area departments, area coordinators were sought out significantly more than regular teachers. This finding in triangulation with qualitative data presented suggests that area coordinators played a critical role serving as hubs for teacher communication and collaboration. It also points to the high level of influence and power that area coordinators had over MYP implementation through their frequent and spanning interactions with teachers. Longitudinal data shows that over the course of MYP implementation area coordinators became significantly more central within their teams. Given that grade level collaboration became more frequent through the first year of implementation, coordinators increased centrality might be a consequence of less frequent teacher-teacher interactions in area departments, who became more reliant on the stronger teacher-coordinator ties.

While area coordinators were most influential in curriculum networks, it was found that networks related to the transfer of information directly related to the IB were strongly centralized on the MYP coordinator. Teachers sought and received IB information from the MYP coordinator significantly more than any other coordinator in the school including their respective area coordinators. The MYP coordinator had a normalized in-degree of 50.85 in the IB information network while the next most influential individual in the MYP was the social sciences coordinator who had an in-degree of 18.64. Teacher-teacher communication in this regard was significantly less

frequent than around curriculum issues and relied more on the active role of the MYP coordinator.

Expressive and Instrumental Relationships Correlation

The final finding offered by social network data on the school relationships supporting MYP design and implementation is the significant correlation between instrumental and expressive interactions among school faculty. It was found that frequent and stable teacher collaborative relationships were paired with strong connections among colleagues on a personal level. The curriculum collaboration network and the effort recognition network measured presented a correlation of .380 (0.031). This correlation indicates that the existence of dyadic instrumental relationships dealing with the development of lessons and strategies was predicted by the presence of socioemotional ties among teachers. Triangulation with qualitative data shows that teachers consistently referred to relationships of trust, empathy and personal support as key to building working relationships. The quality of these relationships was described by a social sciences teacher,

> The teachers that I work with closely are not just colleagues, they are my friends. We help each other on a personal level and are also able to look eye to eye and tell each other the things we have to, even when is something we don't like. We share the trust needed to be able to do that.

This type of relationship was referred to by the majority of teachers as the foundation to their working relationships. Similarly to instrumental networks, area coordinators were found to be strong promoters of a supportive atmosphere within their teams. In-degree centrality in the effort recognition network indicates that they were the main source of socioemotional engagement. Teachers reported that an important part of

the coordinator's role was to build relationships with and among the team that went beyond mere work exchanges and became closer on a personal level. The math coordinator expressing a common view among coordinator said,

> We have developed such good relationships in our teams that we are truly friends and the subordinate relationship does not exist. It is fundamental that the coordinator and all teachers are seen as one more and that we can go to each other for help without reservations. We have our roles as coordinators, which they respect, we care for each other a lot, and above everything we work to create a pleasant environment in which we can be motivated and keep improving as teachers.

Overall, social network data offers several important findings that complement and support the qualitative aspects of MYP design presented in the first part of this chapter. First, team densities indicate that most teacher interactions dealing with curriculum planning occurred within area department units corroborating qualitative findings. These interactions were found to consist primarily on the exchange of new and effective classroom strategies. Second, comparison of departmental teams curricular networks shows significant variability in their density, coordinator centrality and teacher interaction patterns. Three factors were identified as constraining teacher collaboration within departments: team instability, teacher program buy-in, and the multiplicity of administrative requirements. Third, during the first year of MYP implementation there was a significant increase in teacher interdisciplinary collaboration within grade levels. The 6th grade team and the entrepreneurship department, as also indicated by qualitative data, stood out in their respective roles in interdisciplinary networks. The 6th grade presented the densest networks among grade levels implying higher frequency of interdisciplinary planning while entrepreneurship was found to be an important

collaborative hub for teachers in all area departments. Fourth, coordinators were found to be central in all networks measured confirming their highly supportive role described in the qualitative section. Area coordinators were central in curriculum collaboration networks within area departments and became significantly more during the first year of implementation. The MYP coordinator was highly central in networks related to the flow of IB information for the school overall. And fifth, expressive networks measured through effort recognition were correlated with instrumental networks indicating the importance of teachers' personal relationships as the foundation for collaborative work.

In this chapter I have presented an in-depth analysis of data collected on design and early implementation of the IB's Middle Years Program. This analysis consisted first, on dissection of MYP curriculum development into the three discrete design tasks that embodied it, their social distribution and the factors that shaped them. The first two tasks, reorganization of content and alignment to MYP objectives, were foundational steps through which the curricular vertical plan was assembled. Although both of these tasks were enacted within the frame of area departments, the social distribution/dynamics involved in their completion were markedly different. The first task, pursuing redistribution of subject content across grade levels, needed a vertical articulation that required all teachers within a department to make decisions together. Thus, its social distribution was stretched over entire area departments with teachers participating through joint meetings, moderated by area coordinators, in a simultaneous "collaborative" form. However, the second task, alignment of content with MYP objective, was also performed by all teachers but this time in an atomized form with

teachers individually working on their assigned content under one-on-one supervision of area coordinators. In this case teachers' ownership over their respective material and the time-intensive nature of the task shaped the "collective" or "atomized" social distribution of its enactment. Based on the curricular foundation built by the first two tasks, the third design task consists of the ongoing/continuous development of interdisciplinary lessons by teachers within grade levels. The social distribution of this task was "collaborative" with teachers participating on equal standing in design of joint learning units. However, teacher participation in Task 3 was also highly fluid and determined by their expertise in working across disciplines, belief in the effectiveness of interdisciplinary instruction, focus on project-based approach, and the existence of stable collaborative relationships among teachers. Analysis of the three MYP design tasks showed the distinct social distribution each of these tasks take (the ways teacher work and interact with each other) as shaped by the nature of the task as well as contextual factors determining social dynamics for their completion.

Analysis of design tasks was followed by a set of critical support tasks performed by coordinators in benefit of teachers' successful design and implementation of the MYP. Area coordinators through established relationships with teachers and their widely recognized experience offered support for lesson design and implementation, they built vertical cohesion among grade levels, and supported teachers on a socioemotional level. The MYP coordinator spanning all area departments and grade levels within the program provided an administrative and logistical direction to the program, she strengthened the IB pedagogical vision, and promoted horizontal connections among departments for interdisciplinary planning. These supportive tasks were socially distributed among all

coordinators and performed in a "collective" form with coordinators enacting them individually and separately within their own assigned realms. Exploration of this second set of tasks indicates that in a highly participative and collaborative process such as the MYP design described, a centralized effort on the side of coordinators was crucial in providing support and direction to teacher teams. Furthermore, it suggests that goal-specific tasks such as MYP design are continually sustained by other leadership actions—in this case centralized on area coordinators—that structure their achievement and channel them towards standards of quality such as the IB's.

The social network data, related to design and implementation of the MYP, provided a quantitative picture of the teacher relationships that shape patterns of collaboration and support within the school, its area departments and grade levels. Social network findings strongly supported and critically complemented the qualitative description of design and support tasks described in the first two sections of this chapter. First, analysis of curriculum networks showed that most interactions around planning occurred within area departments confirming the importance of these units in development of the MYP master plan. Second, it provided a more detailed quantitative picture of the variation found among departments as well as illustrating through network maps their distinct social configurations. Through triangulation of network and qualitative data three conditions were identified as constraining teacher instrumental interactions: team instability, teacher program buy-in and multiplicity of administrative requirements. Third, longitudinal network data indicated a significant increase of lesson planning within grade levels showing the evolution of interdisciplinary planning (Task 3) during the first year of MYP implementation. Interdisciplinary networks also highlight

and quantitatively confirm the uniqueness of the 6th grade team and the entrepreneurship department as exemplary cases of this form of planning. Fourth, it confirmed the central role of coordinators described in the qualitative section through their high degree of activity and influence found within instrumental networks. And lastly, comparison of instrumental and expressive networks quantitatively indicated the strong correlation existing between teachers' personal relationships and their ability to work collaboratively around curriculum. As a whole social network analysis adds a new dimension to the study by providing a quantitative measurement of the social dynamics that led to accomplishment of an MYP master plan. Social networks confirm and complement task analysis done through the distributed leadership lens through detailed measures and maps of the human relationships shaping in their enactment. The following chapter will further integrate these findings by positioning them within the established distributed leadership theory and network theory of social capital.

CHAPTER V
Discussion

In the face of a global need for models of schooling that emphasize the intellectual skills needed in the information era and make use of our improved understanding of human learning, this study set out to explore the school-based design of the International Baccalaureate's (IB) Middle Years Program (MYP) in a Venezuelan K-11 school in the initial phase of program development. The study's purpose was to provide a deep and careful analysis of the work done by the school and its teachers as they adopt, design, and begin implementation of this highly innovative and challenging program.

The theoretical framework for the study was provided by the two bodies of literature explored in Chapter 2: distributed leadership and social networks. The first presents leadership in organizations as residing in the actions or "tasks" directly related to the achievement of the organization's mission. These tasks are enacted by organizational members through a variety of social arrangements that determine its distribution and the degree of influence these members have on direction, quality and achievement of tasks. The second body of literature, social networks, offers a theory for measuring and understanding the social interactions and overall social dynamics that take place within organizations, carry a productive value (social capital), and shape collaborative work. These two theories are jointly integrated in this study as they have the potential of being highly supportive and complementary of one another, and together can provide deeper explanations of the social processes that occur within schools designing new academic programs like the one this study set out to investigate.

Based on this literature, three main research questions guided this study:

1. How is the process of MYP curriculum planning socially distributed in this school?
2. In what ways has the implementation of the MYP supported or constrained leadership distribution around curriculum in this K-11 school?
3. In what ways do existing social networks support and constrain the work of teachers and administrators around MYP curriculum in this school?

The study's methods of data collection, delineated in detail in Chapter 3, consisted of conducting a Social Network Analysis survey, which explored three relationships related to the design of the MYP program (curriculum collaboration, flow of IB information, and effort recognition). In addition, data were collected through semistructured interviews with teachers, coordinators, and administrators involved in MYP design, observations of planning meetings, and document review of a variety of planning instruments.

Through data analysis and triangulation I derived the main findings presented in Chapter 4. First, as was shown, the development of the MYP curricular master plan was embodied by three main design tasks: reorganization of content across grade levels, within grade level alignment of content and MYP objectives, and the development of interdisciplinary instruction. Each of these tasks was implemented following distinct organizational and program needs particular to each of them and which were found to impact the extent and form of their social distribution. Second, design tasks were critically supported by a second set of tasks that were found to be strongly centralized on subject area and MYP coordinators. Area coordinators supported lesson planning and implementation, vertical cohesion across grade levels, and provided teachers

socioemotional support. On a second level, the MYP coordinator acted as IB information disseminator, performed as supervisor of area departments' lesson planning, served as active advocate of the IB pedagogical vision, and promoted horizontal connections among area departments for interdisciplinary planning. Third, social network data provided a quantitative picture of the teacher relationships that shaped patterns of collaboration and support within the school, its area departments, and grade levels. These quantitative findings strongly supported and critically complemented the qualitative description of design and support tasks described previously.

In this chapter, I will discuss these findings through the theoretical frameworks of distributed leadership and social networks and highlight their practical importance in relation to the development of 21st-century school models. First, the types of leadership tasks found to embody design of the MYP will be discussed along with an exploration of the relationships among them. Second, the social distribution of each of these tasks will be explained through a social network lens in an attempt to deepen understanding of their social dynamics and expand the scope of distributed leadership. Third, a revised theoretical model integrating distributed leadership and social networks based on this study's findings will be presented. Fourth, a set of practical lessons for the school-based development of 21st-century programs will be offered. Fifth, implications for educational research and practice will be discussed. And finally, the limitations to this study and directions for future research will be presented.

Task-Defined Leadership

Distributed leadership defines leadership as "the design and enactment of tasks involving the identification, acquisition, allocation, coordination and use of social,

material and cultural resources tied to the core work of the organization" (Spillane, 2006; Spillane, Halverson, & Diamond, 2001). These tasks rely on the actions of a variety of school members in addition to those of formal leaders. This theory proposes in its people dimension that individuals involved in performance of leadership tasks do so in different social arrangements through which these tasks are accomplished. The situational dimension of distributed leadership adds that task enactment is also constituted by the organizational structures, routines and artifacts on which its completion depends. This study focused on the people dimension of the school's MYP design and early implementation and was guided in its data analysis by the theoretical model developed in Chapter 2 (Figure 5.1).

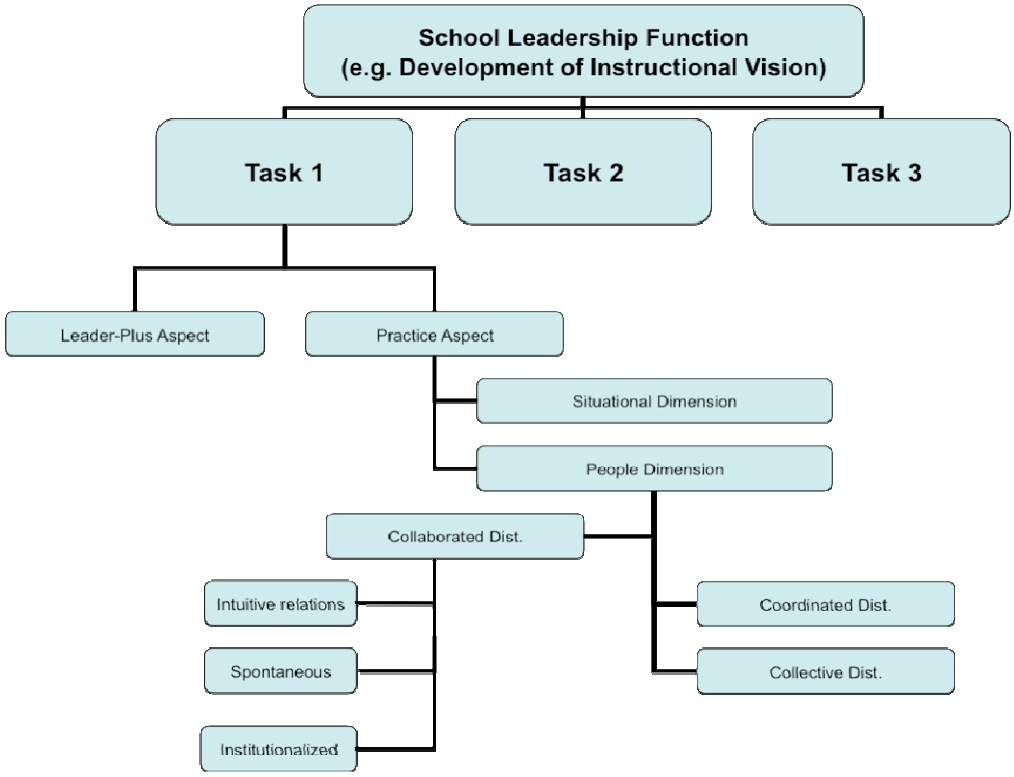


Figure 5.1: Distributed Leadership Model (Integration of Spillane, 2006; Gronn, 2003)

This study shows that distributed leadership's focus on productive tasks allows for a finer-grained examination of the unfolding of leadership actions that ultimately determine the achievement of school goals. Analysis of a complex, school-based process such as the MYP design through a distributed leadership lens enables a discussion of organizational change and innovation efforts based on a generalizable language of actions and social dynamics as opposed to narrow descriptions revolving around individuals and personal characteristics. In this study, leadership for the development of the MYP is defined by two distinct, data-based task categories that drive its achievement: curriculum design and teacher support.

Curriculum design tasks were those dealing directly with assembly of the curricular master plan that was to be the blueprint of the program. These tasks were in essence macro instructional-planning steps directed towards a detailed, school-wide tangible outcome (MYP master plan). Three distinct but interrelated design tasks were enacted by teachers for completion of this goal-specific effort in the following order: reorganization of content, content-IB alignment, and development of interdisciplinary lessons.

Design tasks were critically dependent on each other's completion and were thus enacted sequentially. The curricular vertical plan produced by the first task was an essential starting point for the second task, which was to align reorganized content with MYP objectives. Together, the first two tasks are considered *foundational* tasks for the MYP given that their enactment created the school's program master plan on which the program's instruction relied. The third design task, development of interdisciplinary lessons, built upon this curricular foundation by designing learning units across subject

areas based on the finished master plan. This task, in contrast to the two foundational ones completed in the early stages of MYP design, is a *continuous* design task whose enactment will be ongoing during implementation of the program and represents the school's interdisciplinary orientation to instruction. Design tasks were then sequentially related, which determined the temporal aspects of these leadership actions with completion of each step signaling the start of the next one. Chronological enactment also highlights a high degree of interdependence in design tasks' outcome quality. Alignment of content with MYP grade level learning objectives will depend on the appropriate vertical distribution of content achieved by the first task and the interdisciplinary connections guided by overlapping content and learning objectives will depend on the outcome of the second task.

Teacher support tasks, on the other hand, consisted of actions aimed at providing teachers with the assistance necessary for the successful design and implementation of the MYP. In contrast to the outcome-oriented design tasks, the purpose of these tasks was to ensure teachers' access to quality resources and to provide pedagogical direction to the program. Although design tasks were sequential and resulted in a tangible outcome that allowed the next task to unfold, the support tasks provided the oil and fine tuning that made the design and implementation of MYP flow smoothly.

MYP design tasks were supported through three main types of support tasks: administrative, pedagogical, and socioemotional. *Administrative support* provided relevant logistical information, formats, and schedules that channeled the completion of program design. *Pedagogical support* had two main forms: sharing of innovative classroom activities aligned with the IB framework and creation of instructional

coherence within and across grade levels. The third critical support task was *socioemotional support* such as encouragement, praise, and personal advice to teachers. This support represented an expressive balance to the school's instrumental work. These support tasks were enacted simultaneously and were ongoing throughout the entire program-design process.

Social Distribution of Tasks

The previous section discussed the general types of tasks found to embody leadership during design of the MYP master plan. This classification offers important insights about the actions needed to move such a school-level effort toward its achievement and the strong interrelation that exists among those actions. An important need in the distributed leadership literature is the empirical description of how different types of school tasks are socially distributed and the factors that shape each tasks' social dynamics. For the theory to have a stronger research-based foundation it is critical to identify and understand the variety of social configurations that determine the extent and form of the social distribution of leadership tasks (Spillane, Halverson, & Diamond, 2001; Timperley, 2005). Equally important is to understand the reasons why enactment of certain tasks is highly distributed while others are more centralized, why some are performed in a collaborative fashion while others might be distributed but performed independently by individuals. To address these research gaps, this section will discuss the social distribution of each of the tasks involved in design of the MYP master plan as well as the factors and conditions that shape each task's social dynamics.

As argued in the literature review, an appropriate understanding of leadership as socially distributed actions, of how task enactment is stretched over people, will be

elusive until conceptual and empirical clarity on the productive patterns of human interactions is incorporated into distributed leadership theory. This study, based on the idea that social relationships harness an organization's goal orientation, shared trust, and transfer and creation of knowledge (Leana & Van Buren III, 1999), proposes social network theory as a novel framework and quantitative method to deepen the distributed leadership perspective. Through out the following section, the social distribution of leadership tasks during development of the MYP will be discussed and further developed by drawing from the social networks perspective.

The task-centered focus adopted by this study to understand school leadership during the process of MYP design, along with the measurement of networks around relevant relationships, enabled the identification of the variety of work configurations the school and its teachers adopted for the completion of tasks. These social configurations obeyed seemed to follow the specific nature or purpose of the task and were shaped by a diverse set of contextual conditions that became relevant to each task enactment. Analysis of the social distribution of curriculum design and teacher support tasks uncovered offers important insights that help illustrate the context and social forces at play when tasks were being carried out. Each of these tasks offers something unique about the way teachers worked in different degrees of distribution for the accomplishment of school goals.

Design Tasks

In this section the social distribution of design tasks will be discussed in terms of distributed leadership forms defined by current literature and explained through the lens of social network theory. The first design task, reorganization of content, was socially

distributed across all teachers within subject area departments through their active participation in discussion and decision-making regarding the appropriate vertical placement of content for the MYP. Under Spillane's (2006) distributed leadership forms, Task 1 could be described as a *collaborative form of social distribution* where actors involved are coperforming the task through interdependent, interactive, and simultaneous actions. Figure 5.2 illustrates the social distribution of this task. Each blue circle represents an individual involved in task enactment and arrows represent the direction of social interaction for task completion.

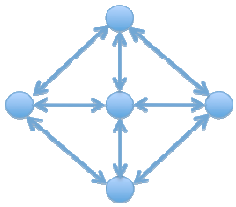


Figure 5.2: Collaborative Social Distribution

The main reason behind the collaborative enactment of this task was the need to create vertical academic coherence. Content and pedagogical consistency across grade levels could have only been achieved through participation of all teachers involved within each subject area. Academic coherence relies on the "reciprocal interdependence" (Spillane, Diamond, & Jita, 2003) of teachers' pedagogical resources and expertise pooled together during area department meetings focused on joint curriculum design; thus enactment of the task became stretched over all its members. The collaborative distribution of this task represents the highest potential for program success as multiple

studies have found that incorporation of teachers in decision-making at the school level is a key practice for reform efforts (Beachum & Dentith, 2004; Smylie & Brownlee-Conyers, 1992; Suranna & Moss, 2000). Through this distribution, teachers are able to jointly define the program's values and goals within their specific context and further develop the collaborative relationships needed for its implementation (Frost & Durrant, 2002).

The established structural role that area departments play in the school and the conscious instructional management assigned to them makes the social distribution of this task based in what Gronn (2003) describes as *institutionalized practice*. Teacher interactions guiding the reorganization of content task followed the formalized structure of area teams and weekly meetings moderated by appointed area coordinators. Moreover, although Gronn differentiates institutionalized practice from *intuitive working relations*, area departments' shared trust and strong informal relationships, as found in this study, suggest that these two forms of social distribution can be inclusive of each other. Functional formal structures can potentially lead to intuitive forms of collaboration increasing team stability and effectiveness.

While these conceptual forms of distributed leadership capture the general configuration of task enactment, the actual teacher interactions shaping them and creating new school value/knowledge are best illustrated through social networks. Measurement of teachers' collaborative relationships around curriculum made it possible to quantitatively determine how they were coperforming Task 1. As reported in Chapter 4, social networks analysis provided significant evidence of the dense informal, instrumental relationships supporting the formal structure of area departments. Teachers

had frequent and stable collaboration with colleagues teaching similar subject areas, and in particular with area coordinators, toward development of a common curriculum. The study revealed the high potential of these relationships to achieve tangible instructional outcomes and is best explained by Lin's (2001) social capital pathways.

First, the dense area department networks acted as vital channels for the efficient flow of critical knowledge regarding appropriate subject content, who would teach it, and who had teaching expertise that would lead to informed decisions on curriculum. Second, the high level of autonomy found in area departments signals the existence of a strong group identity shared by teachers with similar professional backgrounds, which might facilitate internal decision-making through a common pedagogical language and reinforcement of team unity. Third, the formal and central position of area coordinators within curriculum networks drives collaborative task enactment forward through their widely recognized expertise and the additional resources they are able to bring from the power position they occupy. Thus, these social processes described by social network theory help explain the underlying forces guiding the successful enactment of a collaborative task such as Task 1.

Furthermore, social networks enabled me to uncover and differentiate the degree of activity that individuals performing a collaboratively distributed task actually undertake. Distributed leadership forms described by current literature seem to assume homogeneity among individuals within each form (e.g., in Spillane's (2006) collaborative distribution example of joint development of planning protocol all teachers are assumed to collaborate uniformly). However, the variability found on the number of teachers' collaborative relationships around curriculum shows that this is not the case. Variable

teacher activity and relative position in area department networks demonstrates that individuals' involvement and influence on task enactment is not equally distributed, even in a collaborative task such as Task 1.

The degree and form of teacher participation in this task was impacted by both individual and team-level factors. As reported in the results chapter, team instability was an important restricting condition to teacher collaboration with part-time and new teachers participating less frequently on curriculum discussions. Buy-in to the MYP and collaborative planning also appeared to influence teachers' active participation in curriculum development. Another factor impacting teacher curriculum collaboration was a teacher's ability to deal with multiple administrative requirements given that the more time they spent filing paperwork, the less available they were to collaborate with colleagues. In addition to these, social networks also indicate that area departments were relying on the coordinators for curriculum development at different levels. While all coordinators were central to their teams, certain departments' collaboration seemed to revolve mainly around the coordinator at the cost of teacher-teacher interactions.

The second task, alignment of content with MYP objectives, was also socially distributed among all teachers in the MYP but, in contrast with Task 1, Diploma Program teachers were not involved and it was enacted in a more individualized form. Due to factors that will be discussed, Task 2 became an essentially horizontal task for grades 6th through 9th where teachers worked independently of each other to build the pedagogical links between the content vertical plan and the IB program's objectives. This social distribution is what is referred to by Spillane (2006) as *collective* distribution where individuals work simultaneously but separately performing related tasks towards a

common goal, in this case each teacher assembling their respective course in pursuit of an aligned and finalized school-level MYP master plan. Because of the ambiguity of the term "collective" to express this configuration for this particular task and the relevance of teacher independence in its final outcome I will refer to this form of social distribution as an *atomized* distribution highlighting its broad but disconnected teacher participation. Figure 5.3 illustrates the social distribution of this task.

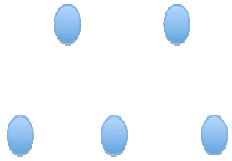


Figure 5.3: Atomized Social Distribution

The atomized enactment of Task 2 was the result of task-specific and contextual factors that distinguished it from the collaborative form of Task 1. First, there was a sense of individual teacher ownership of the content to be aligned given that each teacher was in charge of their subject area for an entire grade level. Responsibility for grade level content alignment was not shared by entire teams but instead was separately assumed and completed by respective teachers. While it could be presumed from the data presented that teachers' overall openness to collaboration in this school would counter teacher isolation in this task, collaborative enactment was further hampered by a second factor. Creating the connections between content and student achievement of MYP's learning objectives was an intellectually complex and challenging task that required teachers to spend extended periods of time in its completion. The time-intensive nature of the task coupled with deadlines set by the impending IB's program authorization visit made teacher collaboration on alignment mostly expendable for the benefit of a timely finished

master plan. Even though teachers would work side by side during administrative hours to perform this task they would do so independently as this involved less deliberation and swift completion.

The social networks measured on the flow of IB pedagogical knowledge—critical to Task 2—confirms the atomized description of this task showing less densely connected teacher networks that were strongly centralized on the MYP coordinator and on area coordinators to a lesser degree. While content-MYP alignment was performed by teachers individually, as presented in the results and to be discussed under support tasks, MYP and area coordinators played an important guiding and supervisory role toward quality pedagogical links.

However, lower levels of teacher collaboration and knowledge flow related to this task represent idle social capital resources that would have been valuable for its enactment. IB knowledge residing in Diploma Program teachers, acquired through 10 years of program training and implementation, was not purposefully accessed for content-MYP alignment. Their expertise with the achievement of IB learning objectives had the unused potential to enrich the process and provide middle level teachers with valuable proven examples of alignment. Since MYP teachers did not interact significantly around this task either, the flow of information related to their shared process was also prevented. Teachers independently performing similar tasks could have informed each other on planning for similar learning objectives and overcoming common alignment problems. Individual ownership of grade level subject content and the additional time constraints imposed by internal and external supervisory deadlines restricted teacher collaboration and information flow that would have been beneficial to this highly complex task.

The third task, development of interdisciplinary instruction, was socially distributed across diverse and fluid configurations of teachers who jointly developed interdisciplinary units within grade level teams. Similarly to Task 1, its social distribution is considered to be *collaborative* with teachers involved meeting and participating on equal footing in designing a common learning unit. Collaboration was fundamental in enacting this task since the essence of interdisciplinary instruction lies in teachers jointly integrating subjects traditionally taught disconnected from each other. In a context of teachers specialized in single disciplines, it was necessary for them to engage and coordinate with colleagues from different area departments to create interdisciplinary lessons. This proved to be a challenge, as teachers have been found to traditionally rely on individual and isolating forms of lesson planning and implementation (Huberman, 1993; Little, 1987; Rosenholtz, 1989).

Unlike Task 1 where collaborative enactment was framed by institutionalized teams as a whole, Task 2 took what Gronn (2003) refers to as *spontaneous collaboration*. This form of social distribution came about when teachers identified content and objectives laid out in the master plan in different subjects as overlapping or fitting in some way for its integration in an interdisciplinary learning unit. Spontaneous collaboration results from the coalescence of teachers' knowledge and resources for the design and implementation of a specific lesson, with teachers then return to their daily work patterns. Figure 5.4 illustrates the social distribution of this task.

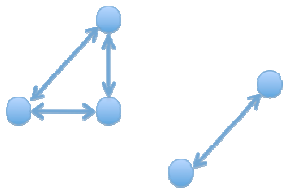


Figure 5.4: Collaborative (Fluid) Social Distribution

While many of the interdisciplinary learning units developed were the result of new working relationships based on links identified in the MYP master plan, development of several units was strongly influenced by previously established *intuitive working relations*. Colleagues across disciplines who had worked together in instruction and designing academic projects were among the most active in reinforcing patterns of interdisciplinary collaboration during MYP adoption. The parallel coexistence of these two forms of social distribution within this task underlines the absence of institutionalized practices related to interdisciplinary planning. Although grade level teams have traditionally worked together on discipline and logistical issues in this school, they did not formally deal with instruction jointly. Moreover, while area coordinators play an important role in providing institutionalized guidance to area departments' work, there were no appointed instructional leaders within grade levels for interdisciplinary planning. Previous studies have found that in the absence of formal decision-making functions leadership and reform processes become undermined (Brazer, 2004; Martin & Chrispeels, 2004). This lack of established formal structures combined with the time needed for teams to learn to enact novel tasks such as interdisciplinary planning (Urbanski & Nickolaou, 1997; Yep & Chrispeels, 2004) appears to have been an important contributor to the variability of Task 3 enactment across grade levels.

For Task 3, integration of social networks with distributed leadership findings offered two advantages to this study: quantification and further understanding of grade level and area department patters of social distribution and detection of longitudinal changes in social distribution during the first year of program implementation. First, while qualitative data indicated the different degrees and social configurations of interdisciplinary planning across teams, social network analysis provided a more accurate picture of the significant differences in teacher interactions within grade levels and area departments around this type of planning. While this study was not focused on a comparative analysis of teams' performance, social network measurement of this task and its triangulation with qualitative data allowed identification of two school units, the 6th grade team and the Entrepreneurship department, as strong and instructive cases of interdisciplinary planning and instruction.

The 6th grade collaboration network, which was twice as dense as all other grade levels, illustrated the idea of the high frequency of teacher ties that are necessary for the consistent development of interdisciplinary lessons in a collaborative distribution. Through strong collaborative ties teachers are able to share and generate knowledge that directly impacts student learning (Darling-Hammond, 1998; Louis, Kruse, & Associates, 1995; Rosenholtz, 1989). The social capital represented by these ties was built on high levels of trust and team unity of purpose, the existence of a shared expertise on interdisciplinary instruction that teachers could jointly draw from, and the presence of dense channels of communication among them for the transfer of relevant knowledge. The presence of these conditions has been found to stimulate innovation and the creation of value represented in this case by new interdisciplinary learning units to be adopted by

the school (Nahapiet & Ghoshal, 1997; Tsai & Ghoshal; 1998). Findings from social network literature indicate that dense networks formed by strong ties and integrative structures support deeper levels of collaboration by developing shared organizational mechanisms and by facilitating the transfer and creation of detailed, nonroutine, and complex information such as the one needed for developing coordinated learning units among teachers (Hansen, 1999; Reagans & McEvily, 2003; Uzzi, 1997).

The Entrepreneurship Department was also revealed by social network analysis as particularly relevant to the social distribution of interdisciplinary collaboration. Among the vertical structures represented by area departments, Entrepreneurship was the most central and externally focused in MYP grade levels. The team served as a hub for all other area departments to collaborate in designing lessons with an interdisciplinary orientation. Among the variety of teacher configurations that took shape to develop these lessons the active presence of Entrepreneurship teachers was a common denominator for many of them. The high levels of interdisciplinary collaboration involving this team's members in conjunction with other area departments was associated with the type of knowledge residing in its teachers and the accessibility to them by colleagues. Teachers in the Entrepreneurship Department were trained in a variety of technological and design tools that were especially in demand by teachers in general to incorporate into their lessons. Moreover, Entrepreneurship teachers' prior expertise in performing this type of task was another knowledge-related factor shaping the social distribution of its enactment. These teachers' openness in sharing this knowledge and willingness to work across departments made them the most sought out for the implementation of new interdisciplinary lessons. These lateral, interdepartment ties illustrated through the

Entrepreneurship Department role in the enactment of Task 3 have been found to increase the performance capacity of individual departments as well as the overall school's ability to move new programs forward (Tsai, 2001). This makes the longitudinal study of this task's enactment especially informative of a program's implementation success.

The second advantage provided by social network data in studying Task 3 was the ability to quantitatively measure the longitudinal evolution of the interdepartment ties described above and the interdisciplinary planning accomplished through them. A social network perspective is able to illustrate—within a distributed leadership framework—the fluid and evolving social configurations a continuous task might take over time. In the case of collaborative lesson planning, analysis uncovered a statistically significant move from a social distribution based on area departments to one based on grade level teams. Over the course of the first year of implementation, teachers increased their curriculum interactions with grade level colleagues to develop common interdisciplinary units. The social distribution of area department curriculum collaboration also changed significantly by becoming more centralized around area coordinators after the first year of MYP. These changes represent an important shift in the school's instructional practices following the program's pedagogical philosophy. Just like the tangible outcome (the MYP master plan) produced by Task 1 and 2 defined them as MYP curricular foundational tasks, Task 3's measurable and significant impact on teachers' instructional practice define it as the pedagogical embodiment of the program's interdisciplinary nature.

Teacher Support Tasks

The social distribution of MYP design tasks (reorganization of content, MYP alignment, and interdisciplinary instruction) stands in stark contrast with the more centralized distribution of teacher support tasks. While the enactment of design tasks was stretched over all teachers through active task participation in the different configurations described previously (collaborative, atomized, fluid), tasks in support of MYP design—administrative, pedagogical, and socioemotional—were singly performed by school coordinators within their respective domains.

First, administrative support was provided by the MYP coordinator to all teachers between 6th and 9th grade. Confirming findings from previous studies showing centralized administrative duties and information brokering by formal leaders (Burch & Spillane, 2004; Spillane, 2006), this type of support was the most centralized of all tasks involved in the process of MYP development as it depended entirely on the actions of the MYP coordinator. This centralization was apparent in IB information networks, which were heavily reliant on direct teacher-MYP coordinator communication, and was shaped by two social capital conditions. The social distribution of this task is illustrated by Figure 5.5.

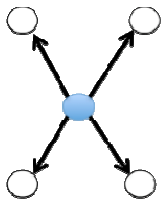


Figure 5.5: Centralized social distribution

The first condition was the exclusive access the coordinator had to IB administrative information (e.g., design instruments, master plan examples, deadlines,

and supervision visits), which made it a strategic position for the access and flow of these resources. Teacher-teacher interactions around administrative information were minimized by the coordinator's monopoly on this information and her conscious efforts to disseminate it during faculty meetings. The second condition contributing to task centralization was the position of authority occupied by the MYP coordinator within the school structure. The coordinator's hierarchical position carried a level of authority that enabled the enforcement of deadlines, procedures and use of instruments presented (Lin, 2001). Previous studies suggest that centralized networks such as this are effective in moving such routine information through out the organization (Cummings & Cross, 2003; Hansen, 1999).

The second support task was lesson-planning guidance aimed at building vertical instructional coherence, and developing horizontal teacher collaboration. Support for vertical coherence was meant to strengthen the academic connection among grade levels and was independently provided by area coordinators in their respective area departments. They did so by advising on classroom strategies aligned with the IB and jointly developing assessment that would build progressively through grade levels. This *collective* form of social distribution consisted of all six area coordinators performing the same supportive practices pursuing a shared goal—vertical cohesion—but in a separate fashion and within their assigned curricular domains.

Social networks illustrated this form of distribution showing through statistical measures and network maps the equivalent central roles area coordinators played supporting their corresponding department's instruction. Centralization of this task's enactment closely corresponded the responsibilities assigned to area coordinators as

formal department leaders. Because regular teachers did not venture into the department-spanning actions required to create vertical coherence, centralization of vertical support tasks was further reinforced. Area coordinators' extensive knowledge and expertise implementing the IB along with the formal position they occupy provided them with the social credentials to make their instructional advice especially relevant for teachers and to create internal department consistency (Lin, 2001).

Through social network analysis it was also found that coordinator support on lesson planning was significantly correlated with recognition of teachers' efforts. This statistical correlation coupled with the prominence of socioemotional engagement among coordinators and teachers reveals the importance of coordinators as providers of both instrumental and expressive forms of support. Trust and empathy built through relationships of an expressive nature aids instrumental interactions through individuals' recognition of each other's professional value and the mutual expectation that agreements will be met. This is supported by other studies that have reported the importance of relational trust in productive interactions as well as facilitating knowledge exchange critical for program implementation (Bryk & Schneider, 2002; Daly & Chrispeels, 2008; Frank, Zhao, & Borman, 2004; Tschannen-Moran, 2004)

Parallel to the enactment of these vertical support tasks, actions supporting the development of horizontal teacher collaboration were performed by the MYP coordinator and were meant to strengthen interdisciplinary instruction in MYP grade levels. Much like the administrative support task, the promotion and support of horizontal teacher connections was completely centralized in this single school actor. The ability to span all grade levels during faculty meetings led by the MYP coordinator provided the unique

opportunity to influence interdisciplinary lesson planning across the entire program. Her deep knowledge of the program's areas of interaction and guidelines for interdisciplinary instruction also contributed to her highly central role in this task.

However, unlike the routine, low-complexity nature of administrative information, which benefits from relying on a central source, the high complexity of the knowledge involved in thoughtful interdisciplinary planning suggests a potential overreliance on a single coordinator for supporting its flow and assimilation. This type of structure has been found to impede the effectiveness of groups engaged in nonroutine, complex tasks, such as high level communication (Borgatti & Cross, 2003), knowledge sharing (Tsai, 2002), and organizational change (Cummings & Cross, 2003; Tenkasi & Chesmore, 2003). While area departments' instruction was supported by their respective coordinator's actions, grade levels did not have internal, formal instructional leaders that would guide and provide support to their collaborative planning. This seems to have been necessary given the novelty of this form of planning in the school and the subsequent variability observed in it implementation during the first year.

Revised Distributed Leadership Model

The distributed leadership theoretical model developed in Chapter 2 and that guided this study's data analysis proved to be a valuable framework for initial analysis of data collected and understanding the general unfolding of the MYP development process. It allowed for the identification of key leadership tasks and a research perspective that considered and explored the actions of all school members beyond appointed formal leaders. However, the incorporation of social network theory into the distributed

leadership model and this study's findings suggest some important revisions to the model initially presented.

First, this study's integration of social network theory with the distributed leadership framework brings along important changes to the initial theoretical model. Combination of these two theories makes the leader-plus aspect of distributed leadership an implicit characteristic of leadership contained in its definition and thus superfluous as a distinct element of the model. Leadership, under the distributed perspective, is embodied by "highly interdependent, dynamic and multidirectional social processes" in which the whole school is involved (Harris et al., 2007). Specifically, the leader-plus aspect states that leading and managing a school requires the involvement of multiple individuals and not just the principal or formal leaders. This aspect is concerned with identifying through research the individuals beyond appointed leaders who are involved in performing leadership actions. However, when social network theory, and its assertion that productive actions are achieved through resources contained and accessed through human relationships, is brought into distributed leadership it is further conceptually implied that school tasks are dependent on the actions of multiple individuals making a distinct leader-plus aspect theoretically expendable.

Moreover, as a research method, social network analysis allows for simultaneous identification of individuals performing leadership actions and patterns of social interaction for achievement of these tasks (the practice aspect domain). These patterns of social interaction as measured by social network analysis embody the conceptual distributed leadership forms (collaborative, collective/atomized, centralized) described in the literature and found in this study. Thus, they are fundamental in classifying and

understanding the different configurations of social distribution making social networks an integral part of distributed leadership theory.

Second, while the initial distributed leadership model presents tasks in isolation from each other, the study found a strong interrelation among the different types of tasks constituting the school's leadership efforts. Design tasks aimed at creating the program's curricular master plan were closely linked in a sequential, step-by-step manner that made completion of each task dependent on the previous one's outcome. Teacher support tasks were ongoing actions associated with the quality enactment of design tasks by providing teachers with resources needed for their achievement. Moreover, tasks of an expressive nature were correlated with the enactment of instrumental ones by providing a key element for functional interpersonal and collaborative relations. These findings lead to a distributed leadership model that considers the interrelation of leadership tasks as it offers a more systemic and interconnected understanding of productive school actions.

Third, this study reveals that Gronn's (2003) typology of collaborative distribution (spontaneous, institutionalized, and intuitive), initially presented as static and unrelated forms needs to be reconsider. Findings suggest that these types of collaboration might in fact evolve from one to another and also coexist within a task. Collaboration based on institutionalized relationships such as an area department team working together guided by the formal role of the coordinator might develop into intuitive working relationships based on successful formal interactions. Similarly, spontaneous collaboration leading to positive outcomes might be valued by its participants and eventually become intuitive or routine practice such as joint design of interdisciplinary lessons based on subject content match. Finally, although not observed in this study

limited to one year of data collection, both intuitive and spontaneous collaborative relationships could potentially be recognized over time and formalized to strengthen task enactment. The interrelation between types of collaboration and the additional model revisions described before are represented in Figure 5.5.

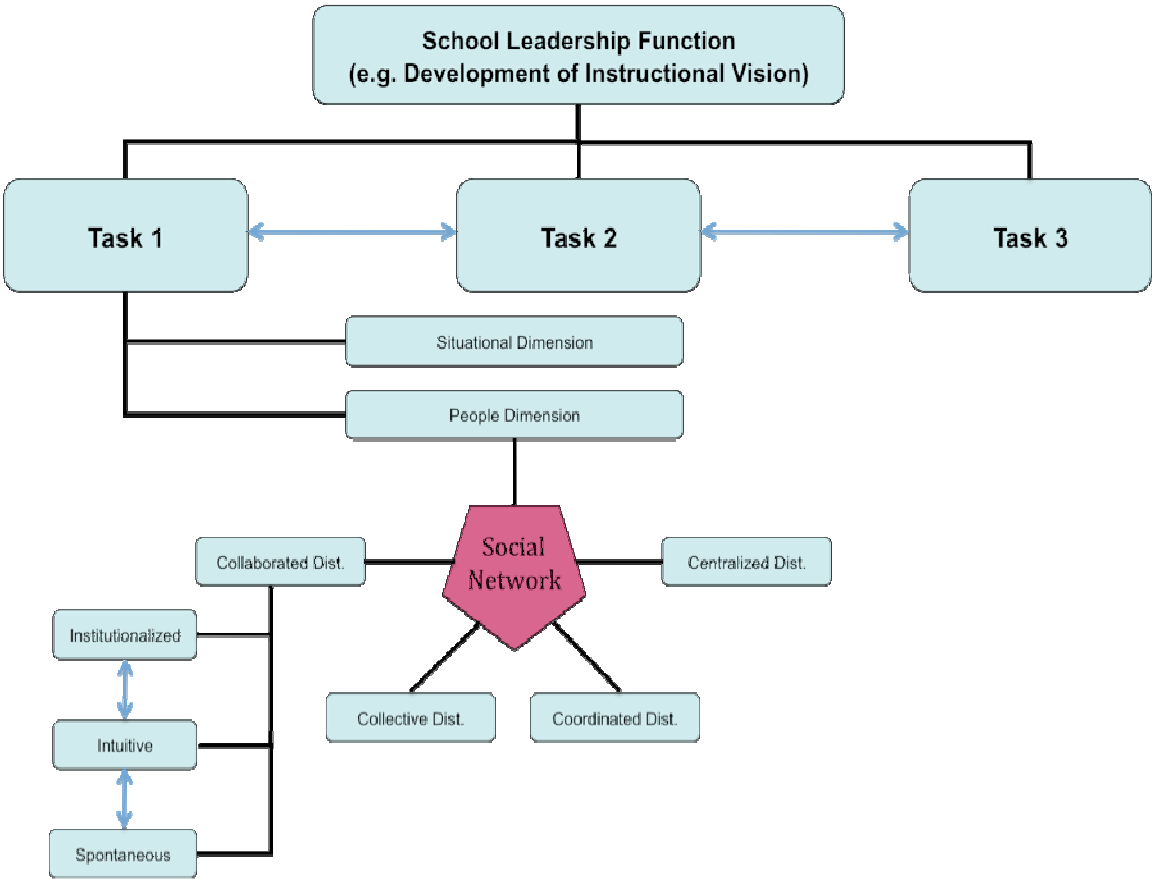


Figure 5.5: Revised Distributed Leadership Model

CHAPTER VI
Conclusions, Lessons, and Implications

This study set out to explore the school-based process of designing an academic program, the Middle Years Program (MYP) of the International Baccalaureate (IB), with an instructional philosophy based on a current understanding of human learning and aligned with the achievement of 21st-century skills. To do so, the study relied on two novel theoretical frameworks, distributed leadership and social networks, that guided its methodology and its analysis. In the previous chapter, findings were integrated and discussed in the frame of these two theories. In this final chapter, the study's theoretical conclusions previously presented through the revised distributed leadership model will be summarized. These conclusions will be followed by important practical lessons and implications for schools and educators involved in the development and implementation of innovative academic programs such as the one studied. Finally, the study will end with suggestions for future research on these programs and for studies conducted from a distributed leadership and social networks perspective.

Theoretical Conclusions

This study's use of distributed leadership, a theory in development, and its combination with social network theory to explore school-based program design resulted in important theoretical conclusions drawn from the discussion in the previous chapter. First, it concludes that leadership tasks - as the primary element of leadership in action - can be classified according as to their specific purpose towards achievement of the school's or the specific effort's ultimate goal. For the school-based development of academic programs, tasks are classified into two types: curriculum design and teacher

support tasks. Previous studies from the distributed leadership perspective have described tasks in broad terms of instructional leadership functions, building management functions and boundary spanning functions (Camburn, Rowan & Taylor, 2003). While these are general types of school leadership functions, this study identifies and describes new task dimensions for specific school change efforts such as the design and implementation of a particular program. Curriculum design tasks are those outcome-oriented actions aimed at assembling the program and ultimately producing a curricular master plan. Teacher support tasks are process-oriented actions that provide vital resources to individuals and teams involved in the design process. This typology allows us to discuss and analyze these efforts through a language of actions, to understand the different steps it takes to move these processes forward and establish relationships among them that contribute to expand distributed leadership's depth and research base.

The second theoretical conclusion from this study is that the integration of social networks into the distributed leadership framework reshapes the initial model in two ways. Social network theory asserts that school-wide, productive actions are achieved through access and mobilization of resources through interpersonal relations thus making the leader-plus aspect of distributed leadership unnecessary as a category in and of itself. Given that the multiplicity of actors involved in leadership actions is assumed, the sole aspect of distributed leadership becomes their practice constituted by the situational dimension (tools, routines) and the people dimension (social configurations). The people dimension, the focus of this study, is further rethought as social networks become the driving method for measuring, and lens for understanding, the social configurations through which tasks are enacted. Through social network analysis the distributed forms

described by Spillane (2006) can be illustrated and their ability to perform certain actions explained under social capital propositions.

The third theoretical conclusion to this study concerns the task and contextual conditions that shape and influence the social distribution of leadership in schools. Task distribution as found by this and previous studies (Camburn et al., 2003; Spillane, 2006) ranges from highly distributed, collaborative enactment to centralized actions performed by single individuals. This study adds to the current literature by proposing links between certain task elements and enactment conditions with the specific social configuration they take. Regarding the nature of the task, actions aimed at building coherence necessarily take a collaborative distribution where all teachers are able to bring their distinct area and grade level expertise to make instructional decisions that affect the entire teaching body.

On the opposite end of the distribution continuum, actions meant to provide teacher support, supervision and guidance take on a centralized distribution, as they require high levels of social credentials to be enacted and allow teachers in general to focus their efforts on instruction. In addition to the task itself, the degree and form of the social distribution of tasks in influenced by school and team level conditions. The existence of formalized participative structures and professional relationships promote collaborative distributions by providing a team framework and assigned roles that allow for discussion and consensus building. Access to task-related information by school members also influences the social distribution of tasks by centralizing it when few members hold a particular type of information or resource and are consequently in charge of dissemination throughout the school. Alternatively, access to information influences task enactment by socially distributing it when knowledge needed for task enactment

resides in multiple individuals and their participation becomes critical to make informed decisions. Finally, time constrains such as those created by approaching deadlines and multiple administrative requirements are related to lower levels of distribution by inhibiting productive interactions among teachers

The last theoretical conclusion drawn from this study is the reconsideration of the relationships between Gronn's (2003) types of collaborative distribution (spontaneous, institutionalized and intuitive). Although, in the initial model these were considered as static and unrelated types of collaboration, this study concludes that there are important relationships between them that can further deepen understanding of social distributions. Successful collaboration based on institutionalized structures may lead to the formation of intuitive working relationships among individuals interacting formally within them. Colleagues previously associated only as mandated by their formal positions may develop rapport and an interest in working together which leads to more stable collaboration than what was in place before. Similarly, spontaneous collaboration between school members, which may come about on a one-time basis for the achievement of a specific goal, can be identified as valuable by its participants and become an intuitive practice or by school administration and become formalized for its continuous enactment. Longitudinal studies from the distributed perspective could provide more detail and deeper data on the evolution and relations of these types of collaboration.

Lessons for Practice

In addition to the theoretical insights presented in the previous section and illustrated in the revised version of the distributed leadership model, this study also

provides important lessons on a practical level for the design and implementation of 21st-century programs such as the MYP. These programs focus on development of student skills such as critical and systems thinking, effective communication and cross-cultural perspectives and do so through instructional approaches that require high levels of teacher collaboration. Several practical lessons offered by this study have the potential to inform school administrators and teachers on the type of actions required in the school-based development of certified academic programs with a 21st-century orientation to learning as well as the conditions that may support and constrain their success.

Development of these programs requires a set of interrelated tasks whose enactment involves everyone in the school through diverse social configurations as required by the nature of the task and shaped by contextual conditions. The process entails outcome-oriented design tasks and process-oriented teacher support tasks. Design tasks lay the curricular foundation incorporating the new program's objectives and establish its novel instructional practices such as the collaborative planning of interdisciplinary lessons. Support tasks provide teachers with the pedagogical resources and guidance needed to design and implement the program at high levels of quality. Analysis of the unfolding of these tasks in the school studied offers the following lessons for program design and implementation.

Coherence-building, collaborative design tasks are critical for the achievement of a systemic instructional vision. The design aspect of these programs creating a school-based curricular master plan demands high levels of vertical and horizontal articulation within the school through various forms of teacher collaboration. Previous studies have found that their design and implementation of 21st-century programs should be based on

the principle of collaboration (Hargreaves, 1994; Henderson & Hawthorne, 2000). The coconstruction of the program's curricular foundation through collaborative configurations is critical for achievement of deep levels of program implementation in the school (Coburn, 2003; Datnow, Lasky, Stringfield, &Teddlie,, 2006). Collaborative vertical articulation across grade levels is critical for the creation of coherence regarding content, learning objectives and appropriate assessment which should sequentially build on each other. Academic coherence across grade levels and subject areas is particularly important for programs concerned with a steady year-to-year progression and that emphasize a systemic approach to learning. Teachers involved in program design may achieve this by working together towards tangible curricular outcomes like the reorganization of content through collaborative social configurations organized by structures such as area departments. Collaborative work within teacher teams aimed at building vertical coherence appears to be enhanced by their relative autonomy to make curriculum-related decisions, the existence of dense instrumental and expressive networks within them, and centralized guidance from trusted and respected formal leaders such as area coordinators.

Horizontal articulation across subject areas within grade levels is also essential for a program emphasizing the systemic nature of knowledge and aiming to implement interdisciplinary lessons. To achieve this, teachers need to collaboratively work toward building connections among their respective subject content and develop joint learning units that integrate this knowledge. This type of teacher collaboration represents the most challenging shift from traditional instructional practice where teachers are commonly focused on single disciplines and plan lessons on an individual manner. This challenge

and teacher resistance to change might result in inconsistent forms of program implementation across grade levels. Moreover, lack of institutionalized instructional practices within grade levels might make horizontal articulation reliant on established intuitive working relationships and spontaneous collaboration that will contribute to the task's social fluidity and fragmentation. Although challenging, a school-wide focus on horizontal curricular collaboration has the potential to significantly and fundamentally alter teachers' instructional practice towards an interdisciplinary orientation to lesson planning in the early stages of program implementation.

Teacher support tasks provide key resources for the enactment of design tasks. Bringing into practice new academic programs such as the MYP also depends on the enactment of support tasks that provide teachers with resources for the achievement of design tasks. Administrative/logistical, pedagogical, and socioemotional resources are all key to individual teachers and team's functioning as they design and implement new programs. Administrative support including setting outcome deadlines, providing planning instruments and performance supervision is critical to the quality and timely completion of program design and implementation. Pedagogical support through help in the development of classroom strategies aligned with the academic program and appropriate assessment is vital for the realization of the program's instructional vision. And socioemotional support consisting of the recognition of teachers' efforts and engagement on a personal level builds the relational trust necessary for collaborative work in instruction. Together they facilitate the development of the program's curricular foundation and teaching practices aligned with its instructional vision.

Tasks that enable access to these resources might be significantly more centralized than collaborative design tasks given that the level of social credentials (such as expertise, power and formal authority) required to enact support tasks are possessed by a few school members. In general, centralization of these tasks offers the potential advantage of a unifying direction to the program by disseminating consistent logistical information, minimizing divergent interpretations and giving regular teachers the ability to focus on instructional issues. However, the overextension of the MYP coordinator in supporting interdisciplinary instruction found in this study warns of the potential negative effects of less distributed forms of support tasks enactment. This becomes especially relevant when the resources being disseminated are of high complexity such as those needed for the novel process of lesson collaboration across area departments.

Certain school and team-level conditions are supportive of teacher teams' collaborative processes. As was shown, school-based development of the MYP was strongly dependent on the collaborative and distributed performance of leadership tasks. This study revealed a number of school and team-level conditions as particularly supportive of teacher collaboration in the enactment of these tasks. First, area departments' autonomy in regards to instructional decision-making promotes teacher collaboration by distributing responsibility away from centralized planning to all teachers. In this context, teachers are then able to work together within their area of expertise towards shared curricular outcomes. Second, teacher collaboration is critically assisted by the guiding and moderating role of formal leaders such as area coordinators. Their formal position of authority and recognized expertise help move collaborative process along by building consensus and finalizing team decisions (Harrison, 2005; Lin,

2001). Third, teachers' sense of shared responsibility for student learning appeared to support high levels of collaboration in instruction. The belief that jointly developed lessons are an effective way to engage students and promote their learning may positively influence teachers' interactions. Furthermore, collective efficacy has been linked to higher levels of student achievement (Goddard, Hoy, & Hoy, 2004). And fourth, intuitive working relationships among colleagues can be developed through the establishment of successful institutionalized structures in the school. Because intuitive relationships are the result of repeated patterns of interactions leading to positive results, formalizing effective working relationships have the potential to deepen collaboration.

Certain school- and team-level conditions constrain teacher teams' level of program collaboration. Analysis of the MYP design and early implementation also uncovered a number of conditions that constrained teacher collaboration during this process. First, a lack of established formal structures that frame collaborative processes within teams, as was the case with grade level lesson planning in this study, appears to negatively impact consistent levels of collaboration. Teachers have been found to be reluctant to take on leadership roles in an informal context (Krisko, 2001; Smylie, 1995; Smylie & Denny, 1990). Under this condition, teachers work together over relies on spontaneous forms of collaboration considerably less stable than institutionalized working relationships (Gronn, 2003). Second, team instability resulting from teacher turnover and unavailability of part time teachers to participate in team meetings limited team collaboration. This lack of consistency prevents teams for establishing stable and frequent collaborative ties focused on instruction and change efforts (Smylie & Brownlee-Conyers, 1992). Issues of time have been salient in studies of teacher

collaboration over the years and its appropriate allocation has been found to be more important than other school factors such as facilities and staff development (Fullan & Miles, 1992; Grossman, Wineburg, & Woolworth, 2001). Third, a multiplicity of administrative requirements such as different levels of planning formats restricts collaboration by redirecting teacher's efforts towards their completion. Teachers employ a disproportionate amount of their administrative hours meeting administrative deadlines, which prevent them from spending time to develop lessons together (Hennessy, Ruthven, & Brindley, 2004). And fourth, low levels of teacher program buy-in within a team can also constrain their participation in collaborative processes. Resistance to an interdisciplinary vision and joint lesson planning may translate into fewer teacher interactions. Overall, these conditions constrain collaboration and foster teacher isolation which can in turn lead to decreased team-level outcomes and uncertainty regarding effective teaching practices (Rosenholtz, 1989).

Implications/Recommendations for Practice

There are several implications/recommendations for school practice and the in-house development of 21st-century academic programs that can be drawn from the study's findings and the general lessons expounded above. One implication is that school-based design of curricula adapted to this type of program requires the active involvement of all teachers through strong vertical structures, such as area departments, to build the initial curricular foundation. This form of teacher teaming should enjoy a considerable degree of autonomy on instructional decision-making and count on formal leaders with the expertise and social credentials to move collaborative processes forward. Given the long-term importance of the curricular outcome of these teams' work, the

school should ensure levels of quality through expert and timely supervision of design tasks. The sequential form these tasks take provide natural checkpoints (content vertical plan followed by content alignment) to ensure outcome quality before proceeding to the next step.

A second implication for schools designing 21st-century programs is that their shared systemic approach to learning will most significantly impact traditional teaching practices by requiring joint, interdisciplinary lesson planning. This impact translates into a challenging shift for teachers from discipline-based to grade level-based instruction focused on offering students with an integrated perspective of subject areas knowledge. The value of institutionalized practices supported by expertise and trust found in this study suggests that schools will be well served by setting up grade level structures that channel this novel form of teacher collaboration. Formally creating opportunities and structures for these teams to flourish and generate appropriate and useful pedagogical knowledge may be an important intrinsic element of program design itself (Chrispeels, Andrews, & González, 2007; Smylie & Evans, 2006). Requiring a number of project-based lessons per subject area, formalizing successful lessons developed so they become routine, and appointment of formal leaders responsible for promoting interdisciplinary collaboration may lead to more and better team outcomes in this regard. However, schools should avoid the trap of merely mandating time and directives to collaborate as forced collaboration may solidify opposition to a program perceived as imposed making future efforts more challenging. Therefore, the development of formal structure and routines should follow careful study of existing working relationships on which to build them.

A third implication is that schools should guarantee the effective dissemination and access to teachers of resources related to design and implementation of the program. On one hand, the flow of administrative and logistical information critical for quality and timely completion of design tasks can be centralized to maximize efficiency of this form of routine information and ensure consistency across the school. On the other hand, the flow of pedagogical resources should be structured so that it is supported by school members with the authority, expertise, and respect to make them relevant to teachers receiving it and promote their implementation. The school should also strive for the establishment and maintenance of a socioemotional network through which teachers engage on a personal level and are able to recognize each other's efforts which is critical for the flow of instrumental resources and collaboration.

A fourth implication of this study is the critical need for schools to address three key constraining conditions to teacher collaboration and implementation of programs relying on it. First, team instability resulting from teacher turnover and time commitments of part-time teachers prevents them from developing the professional relationships and routines necessary for collaboration. Although teacher turnover is a complex issue, the issue of instability could be partially address by designing schedules that incorporate part-time teachers to planning meetings. A possibility might be holding these meetings at the beginning of the school day as opposed to the end of the day when part-time teachers need to leave for their other jobs. This would surely entail additional schedule rearrangements but given the critical need for joint planning time under this type of program it might be worth it. Second, the multiplicity and redundancy of planning requirements should be addressed as they limit the time teachers are able to spend on

collaborative work during their administrative hours. A serious consideration of the need for each planning format and constructive ways to collapse them would benefit teachers and coordinators alike by making most efficient use of their time. And third, pockets of low teacher buy-in into novel programs constrict team efforts to work together and foster teacher isolation. Although a challenging constraint, schools could make use of these resistant individuals' expressive relationships with other teachers and coordinators, critical for the development of instrumental relationships, to build their confidence in the program and open them to collaborative processes. The social pressure exerted by school colleagues and the existence of expressive relationships among them has been found to have a deciding effect in its adoption and implementation (Frank, Zhao, & Borman, 2004).

The final implication of this study for educational practice is the potential for schools to use social network data to provide insight into their overall collaborative and information flow structures. Network measures and maps can provide critical information about the best ways to move knowledge throughout the system, identify relational weaknesses to be addressed as well as working structures to be duplicated in the school. As was mentioned before the formalization of collaborative structures and routines could be instrumentally informed by social network analysis of existing relationships on which to build them. Thus, this method can inform a coordinated and thoughtful effort to build teacher ties and enhance the whole school's capacity for collaboration and program implementation (Daly & Finnigan, 2009; Smylie & Evans, 2006).

Future Research

This study suggests additional areas for inquiry and methodological approaches for future research form a distributed leadership and social networks perspective on 21st-century academic programs. Because this case study's findings are based on a single school implementing the MYP, more studies are needed that look into the process of this program's design in additional schools. Future studies doing comparative analysis of schools designing and implementing the MYP would be helpful by either confirming the types of task uncovered by this study and the social distributions enacting the or by proposing alternative actions and configurations arising from in the program's development. The study of IB schools embedded in different contexts can provide important theoretical and practical insights into the role and influence of national, social and policy contexts on their efforts to internally develop this academic program.

This study found preliminary indications that implementation of the Primary Years Program and the Diploma Program within the school had an important impact on development of the MYP. Future studies on these programs should investigate their role during MYP design phase in greater depth as well as explore the task and social linkages between these three programs. This research focus would offer important and practical knowledge for schools interested in offering a coherent implementation of the whole IB academic experience.

In addition to the IB programs there are multiple programs such as those promoted by the Partnership for 21st Century for Skills and state-based initiatives whose study would provide a wider scope to future research. These studies could offer comparative analysis of the design and implementation of different type of 21st-century

programs, among which it would be especially interesting to contrast leadership distribution and social networks of internally developed programs versus mandated programs with high levels of content and strategies prescription. Traditional schools could also be included in these studies to establish comparisons regarding instructional leaderships tasks and their social enactment with 21st-century programs.

Regarding research methodology this study offers important suggestions for the conduction of future research from a distributed leadership and social networks perspective. Given the dynamicity of tasks and social networks, it is necessary for studies to follow up measurement and qualitative exploration of academic programs' design and implementation efforts over time. Longitudinal studies may allow examination of the evolution of network structures, task enactment, changes in school strategies, and resulting outcomes. This will be critical to establish trend lines in school practices and strengthen theoretical findings supported by statistically significant data.

In this study, conduction of the social network survey was the first step in the data collection process followed up by interviews and observations. Although networks measured were guided by current literature on important organizational relationships and were relevant to the school process studied, they were not exactly matched to the school's leadership tasks since they had yet to be uncovered. Thus, a second methodological suggestion for future studies is the implementation of a data collection process in which identification of tasks through qualitative data precedes and informs social networks measurement. Data collection would begin with qualitative data focused on task identification, followed by the social network survey measuring school relationships involved in task enactment and a second round of additional qualitative data. This

sequence of data collection would allow for an improved match between the tasks embodying school efforts and their social distribution as indicated by social networks.

Regarding qualitative data, the study suggests that additional qualitative components would benefit further research by providing a deeper and more detailed analysis on the internal dynamics of the school and its teams. While this study was able to identify and explain general social patterns in the school and the dynamics of some exemplary teams, establishing significant comparisons among area departments and grade levels requires interviews slanted toward this goal as well as the inclusion of more interviewees and meeting observations. A possibility would be to follow a smaller number of teams and follow their interactions during an extended period of time to be able to draw conclusions about specific team dynamics, their context, and success.

Finally, although this study recognized and focused on the people dimension of distributed leadership as a way to explore collaborative processes, it is just as critical for future research to look into the practice dimension of distributed leadership. Research on this dimension, which is concerned with the tangible tools, instruments, and organizational routines that represent leadership in its daily practice, would prove to be informative on the unfolding of leadership tasks. Specifically for the IB, studies could investigate the role of its prescribed unit planners, the lesson backward-design process among other tools and routines usually implemented in its schools.

APPENDIX A

The IB Learner Profile

The aim of all IB programs is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world. IB learners strive to be:

Inquirers They develop their natural curiosity. They acquire the skills necessary to conduct inquiry and research and show independence in learning. They actively enjoy learning and this love of learning will be sustained throughout their lives.

Knowledgeable They explore concepts, ideas and issues that have local and global significance. In so doing, they acquire in-depth knowledge and develop understanding across a broad and balanced range of disciplines.

Thinkers They exercise initiative in applying thinking skills critically and creatively to recognize and approach complex problems, and make reasoned, ethical decisions.

Communicators They understand and express ideas and information confidently and creatively in more than one language and in a variety of modes of communication. They work effectively and willingly in collaboration with others.

Principled They act with integrity and honesty, with a strong sense of fairness, justice and respect for the dignity of the individual, groups and communities. They take responsibility for their own actions and the consequences that accompany them.

Open-minded They understand and appreciate their own cultures and personal histories, and are open to the perspectives, values and traditions of other individuals and communities. They are accustomed to seeking and evaluating a range of points of view, and are willing to grow from the experience.

Caring They show empathy, compassion, and respect toward the needs and feelings of others. They have a personal commitment to service, and act to make a positive difference to the lives of others and to the environment.

Risk-takers They approach unfamiliar situations and uncertainty with courage and forethought, and have the independence of spirit to explore new roles, ideas, and strategies. They are brave and articulate in defending their beliefs.

Balanced They understand the importance of intellectual, physical and emotional balance to achieve personal well-being for themselves and others.

Reflective They give thoughtful consideration to their own learning and experience. They are able to assess and understand their strengths and limitations in order to support their learning and personal development.

APPENDIX B

Structure the IB programs continuum

PYP	MYP	DP
Programme of inquiry, including scope and sequence documents for six subject areas	Eight subject areas with aims and objectives and assessment criteria	Six groups of subjects with detailed syllabus and assessment guides
Teaching through six transdisciplinary themes	Teaching through eight subject areas connected through five areas of interaction	Teaching through six subject groups connected by theory of knowledge
Units of inquiry within each transdisciplinary theme, incorporating the learning of language, mathematics, social studies, science, the arts and personal, social and physical education	Units of work in each subject area, with some interdisciplinary units of work, focused on the areas of interaction	Course outlines for each subject including theory of knowledge, extended essay and creativity, action, service
	Language A Language B Humanities Sciences Mathematics Arts Physical education Technology	Language A1 Second language Individuals and societies Experimental sciences Mathematics and computer science The arts
Prescribed planner to support inquiry	Recommended planner for units of work	

APPENDIX C

SNA Survey Questions

1) Indicate the frequency of communication (weekly, bi-weekly, monthly, bi-monthly) with people to whom you go to for information on the International Baccalaureate programs offered by the school.

2) Indicate the frequency of collaboration (weekly, bi-weekly, monthly, bi-monthly) with people with whom you work with in developing the content and strategies to be taught in your lessons.

3) Indicate the frequency of express recognition (weekly, bi-weekly, monthly, bi-monthly) of people who recognize and congratulate you on your professional efforts.

APPENDIX D

Principal Interview Protocol

1) Tell me about your experience as a principal:
    a. How long have you been principal of this school?
    b. What was your previous position before being a principal?

2) As you know I am interested in the ways that teachers work together to plan curriculum and instruction, can you tell me about how teachers at your school work together to plan curriculum and instruction. Where and how often does teacher collaboration around class planning occur?

3) How consistent is your vision and philosophy with actual work the teachers do for curriculum planning?

4) What factors support collaboration in your school?

5) What factors constrains collaboration in your school?

6) In what ways do you promote this instructional vision?
    a. Who are your main supporters in implementing this vision?
        i. Who are the formal supporters
            1. Give me an example of how they support it
        ii. Who are the informal supporters?
            1. Give me an example of how they support it

7) What are the most important elements you envision teachers in your school should consider when planning a) the content and b) the strategies of classroom instruction?

8) How do you think teachers decide who to go to for support/input/advice on the planning of their classes?

9) In what ways has professional development supported work around curriculum design and planning?

10) What tools such as protocols, guidelines, assessment, data or textbooks do teachers in your school use for:
    a. Planning?
    b. Instruction?
    c. What is the origin of the tools?

11) How has he IBness of your school impacted your vision and your work as principal?

12) What are the strengths of the way the IB program has been implemented in your school?

13) How does the implementation of the IB program need to be further supported in your school?

APPENDIX E

Coordinator/Teacher Interview protocol

1) Tell me about your teaching experience.
    a. How long have you been teaching?
    b. What do you teach?

2) The MYP teacher team was until recently developing the master curriculum covering 6th to 9th grade. What was your role in this design process? Who had a leadership role? What were the steps taken to complete this task? When and where would design take place?

3) What elements did you and your team consider when designing the master plan?

4) What was the role of the IB coordinators in the master plan design? Administrators?

5) In what ways did teachers provide general input, leadership in the master plan design?

6) What tools, protocols, artifacts or forms did you use for the development of the curriculum?

7) Now moving from the macro level of planning to the more specific task of trimester and unit planning:
    a. Thinking about the different steps in planning the content of your classes, could you walk me through your routine for planning the curricular content and pedagogical strategies of your classes?
    b. Who else besides yourself is involved in this process?
    c. In what ways are these different people involved?
    d. Where (formal and informal meetings) and how often does the interaction with these people focusing on curriculum happen?
    e. What tools do you use?

8) What is the role in planning your classes of:
    a) Grade level team
    b) Subject area team

9) What are the most important elements you/your team consider when planning the content and strategies of your classes?

10) In what ways are you supported on these different elements by other colleagues?

11) What experience have you had so far planning interdisciplinary classes? What has that process looked like? Origin? Leadership?

12) What is the purpose of your GL meetings? Your subject area meetings?

13) How do you decide who to go to? What makes you go to a particular/specific colleague and not others for support/input/advice on the planning of your classes?

14) In what ways has professional development supported work around curriculum design and planning?

15) What roles does the IB play as you plan your classes?

16) How has the IBness of your school impacted your work as a teacher?

17) What tools such as protocols, guidelines, assessment, data or textbooks do you use for planning of your classes?
    a. How do these tools help you/your team?
    b. What is the origin of these tools?

18) What role does IB assessment play in your planning?

19) Are there any other IB tools that you use?

20) In what ways do teachers provide instructional leadership in this school?

21) Looking at your teams' network, how cohesive do you perceive your team to be when working on curriculum planning? What do you see in the map? What do you attribute it to?

22) What do you think are the strengths of the way you plan the content and strategies of your classes?

23) If in any form, how does the way you plan classes in this school constrain your work as a teacher?

24) What are the strengths of the way the IB program has been implemented in your school?

25) How does the implementation of the IB program need to be further supported in your school?

APPENDIX F

Participant Observation Protocol (Spradley, 1980)
Location: I.E. Juan XXIII IB School, Valencia, Venezuela

Dates of Observations: June 2008 through June 2009

Frequencies of Observations: 2 sessions per subject-area department for a potential total of 16 observations

Timing of Observations: Weekly IB planning meeting (1 hour)

Observational Coding Schema (Lofland, 1995, Miles & Huberman, 1994)

- **Acts** (i.e. general activity occurring during session like eating, talking, etc.)
- **Activities** (i.e. notation of specific activities by people in the space)
- **Meanings** (researcher memo notes of interpretation of observations)
- **Participation** (i.e. who is participating at what levels)
- **Relationships** (i.e. people to people, people to objects)
- **Setting** (i.e. furniture arrangements, lighting, art displays, etc)

Recording of Observations:

- Descriptive field notes (events, activities, people)
- Reflective field notes (personal thoughts, reflections)

Access to sites: Access to subject-area departments meetings will be restricted to those where every department teacher has agreed to participate in the study.

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